Yankee Chemistry Spectrum name: 1-1F_14DEC2004_1750.An1

Sample description
Detector 101 FSS-OOL-04-01-010-F-S WET

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\1-1F_14DEC2004_1750.An1

Acquisition information
Start time: 14-Dec-2004 17:44:01
Live time: 2000
Real time: 2003
Dead time: 0.16 %
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: 1.9480E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9480E+03) =
5.1335E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 1-1F_14DEC2004_1750.An1

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	06-Dec-2004 13:45:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 18 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1929

***** 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
75.17	196.	17.59	1.01	1.665E-02	74.81	9.600	8.552E-01	PB212
78.03	103.	37.36	1.01	1.744E-02	77.11	10.700	3.889E-01	PB214
					77.11	17.500	2.378E-01	PB212
83.77	85.	33.41	1.01	1.871E-02				
87.29	174.	17.27	1.01	1.926E-02	86.45	32.740	1.934E-01	EU155
89.61	100.	29.59	1.02	1.956E-02				
93.08	143.	21.21	1.02	1.995E-02	92.38	2.570	1.939E+00	TH234
					92.80	3.000	1.658E+00	TH234
186.01	120.	21.25	1.02	1.858E-02	185.99	3.280	1.366E+00	RA226
209.42	96.	32.48	0.72	1.721E-02				
238.63	819.	4.15	1.12	1.558E-02				
238.63	819.	4.15	1.12	1.558E-02	238.63	43.100	8.466E-01	PB212
241.47	116.	19.34	1.12	1.543E-02	241.00	3.900	1.339E+00	RA224
					241.92	7.470	7.011E-01	PB214
270.10	71.	27.97	1.19	1.401E-02				
295.01	188.	12.56	1.12	1.293E-02				
295.01	188.	12.56	1.12	1.293E-02	295.22	19.200	5.257E-01	PB214
338.32	156.	13.61	1.10	1.135E-02	338.40	12.010	7.954E-01	AC228
351.76	315.	7.75	1.24	1.093E-02				
351.76	315.	7.75	1.24	1.093E-02	351.99	37.100	5.388E-01	PB214
462.77	52.	36.45	0.99	8.355E-03				
462.77	52.	36.45	0.99	8.355E-03	463.51	10.000	4.382E-01	SB125
510.20	90.	19.27	1.03	7.598E-03	510.72	22.500	3.676E-01	TL208
582.96	242.	7.97	1.26	6.686E-03	583.14	86.000	2.925E-01	TL208
609.02	238.	9.32	1.40	6.416E-03	609.32	46.090	5.588E-01	BI214
661.25	81.	22.08	0.98	5.941E-03	661.62	84.620	1.123E-01	CS137

727.21	66.	19.22	1.73	5.443E-03	727.17	11.800	7.150E-01	BI212
794.62	30.	30.91	1.50	5.016E-03	795.76	85.400	4.950E-02	CS134
910.82	199.	9.82	1.24	4.448E-03	911.07	29.000	1.069E+00	AC228
964.06	35.	27.87	1.61	4.231E-03	964.00	14.580	3.973E-01	EU152
968.68	92.	12.81	1.62	4.213E-03	968.90	17.460	8.653E-01	AC228
1120.38	66.	25.75	1.49	3.711E-03	1120.28	15.040	8.154E-01	BI214
1460.29	735.	3.74	1.64	2.943E-03	1460.75	10.700	1.620E+01	K40

Yankee Chemistry Spectrum name: 1-1F_14DEC2004_1750.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1619.69	16.	34.27	1.43	2.682E-03	1620.56	2.750	1.543E+00	BI212
1763.92	39.	16.01	0.69	2.481E-03	1764.51	15.920	6.849E-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	
149.90	75.17	495.	196.	0.098	52.78	1.005	PB-214	D
155.63	78.03	692.	103.	0.052	112.09	1.007	PB-214	D
174.16	87.56	363.	174.	0.087	51.82	1.014	PB-214	lD
418.52	209.42	367.	96.	0.048	97.45	0.723	AC-228	
476.97	238.56	169.	819.	0.410	12.46	1.121	PB-212	D
539.93	270.10	154.	71.	0.036	83.91	1.191	AC-228	
1928.53	964.06	31.	35.	0.018	83.61	1.612	EU-152	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	149.20	74.82	1292.	180.	0.090	87.71	1.499
PB-214	153.79	77.11	1091.	353.	0.176	42.79	1.499D
PB-212	153.79	77.11	1091.	353.	0.176	42.79	1.499D
HG-203	170.89	85.65	1043.	-126.	-0.063	111.87	1.499s
TH-234	185.70	93.06	1048.	150.	0.075	94.69	1.499s
TH-234	185.66	93.04	1013.	154.	0.077	91.22	1.499s
RA-226	371.69	186.02	515.	123.	0.062	82.55	1.499
PB-212	476.97	238.63	442.	660.	0.330	17.86	1.499
RA-224	481.70	241.00	396.	118.	0.059	76.36	1.123D
PB-214	590.18	295.22	199.	170.	0.085	42.09	1.499s
AC-228	676.42	338.32	129.	156.	0.078	40.82	1.099s
PB-214	703.37	351.79	149.	293.	0.146	24.90	1.499s
SB-125	925.72	462.91	100.	45.	0.023	104.23	1.499s
TL-208	1020.34	510.20	86.	90.	0.045	57.82	1.029s
TL-208	1165.93	582.96	55.	242.	0.121	23.92	1.262
BI-214	1218.08	609.02	82.	238.	0.119	27.95	1.401s
CS-137	1322.58	661.25	78.	81.	0.041	66.23	0.984
BI-212	1454.58	727.21	37.	66.	0.033	57.66	1.733
CS-134	1589.47	794.62	29.	30.	0.015	92.73	1.502s
AC-228	1821.99	910.82	55.	199.	0.099	29.45	1.243

Yankee Chemistry Spectrum name: 1-1F_14DEC2004_1750.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1937.76	968.67	32.	79.	0.039	46.73	1.178
BI-214	2241.35	1120.38	59.	66.	0.033	77.26	1.489
K-40	2921.60	1460.29	7.	735.	0.368	11.22	1.644
BI-212	3240.60	1619.69	5.	16.	0.008	102.80	1.431
BI-214	3529.27	1763.92	0.	39.	0.020	48.04	0.694s

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		3.6683E-04					
			477.56	3.668E-04	%(	3.259E-01 9.13E-02	G
K-40		1.6203E+01					
			1460.75	1.620E+01	(	3.235E-01 6.06E-01	G
MN-54		1.3533E-02					
			834.81	1.353E-02	&(	5.530E-02 1.62E-02	G
CO-57		-3.1901E-04					
			122.07	-3.190E-04	%(P	5.211E-02 1.55E-02	G K
			136.43	-7.057E-02	%	4.418E-01 1.32E-01	G
CO-60		3.8015E-03					
			1332.51	3.802E-03	%(P	5.476E-02 1.40E-02	G K
			1173.23	-1.381E-02	% P	7.916E-02 2.12E-02	G K
Sr-85		-2.7024E-02					
			514.00	-2.702E-02	%(	6.232E-02 1.88E-02	G
Kr-85		-5.7175E+02					
			513.99	-5.718E+02	%(	1.318E+03 3.98E+02	G
Y-88		-9.9990E-03					
			1836.01	-9.999E-03	%(P	5.491E-02 1.50E-02	G K
			898.02	-1.494E-03	% P	5.239E-02 1.43E-02	G
NB-94		-9.0529E-04					
			871.10	-9.053E-04	%(	4.993E-02 1.40E-02	G K
			702.50	-7.573E-03	%	5.688E-02 1.65E-02	G K

Yankee Chemistry Spectrum name: 1-1F_14DEC2004_1750.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-1.5817E-02						
		722.95	-1.582E-02	&(	6.625E-02	1.95E-02	G K
		614.37	-1.681E-02	%	5.373E-02	1.60E-02	G
		433.93	7.232E-03	&	4.457E-02	1.31E-02	G
CD-109	-5.8836E-01						
		88.04	-5.884E-01	%(	1.405E+00	4.25E-01	G
SN-113	-3.4897E-03						
		391.71	-3.490E-03	%(P	7.089E-02	2.05E-02	G K
		255.04	4.724E-02	&	2.106E+00	6.20E-01	G
SB-125	9.7503E-02						
		427.95	2.898E-03	%(	1.435E-01	4.15E-02	G K
		600.77	3.484E-02	%	2.410E-01	6.98E-02	G
		636.15	1.134E-01	%	3.822E-01	1.13E-01	G
		463.51	3.775E-01	*(	4.132E-01	1.31E-01	G
		176.29	-4.983E-02	%	6.678E-01	1.99E-01	G
I-131	-2.1919E-02						
		364.48	-2.192E-02	%(	9.873E-02	2.92E-02	G K
		636.97	6.679E-02	%	1.467E+00	4.22E-01	G
		284.29	-1.577E-01	%	1.398E+00	4.13E-01	G
CS-134	-3.5588E-02						
		604.66	-3.559E-02	%(	7.114E-02	2.16E-02	G K
		795.76	4.950E-02	+	4.522E-02	1.53E-02	G
		569.29	4.033E-02	%	2.860E-01	8.30E-02	G
		801.84	-1.097E-01	%	6.364E-01	1.85E-01	G
CS-137	1.1231E-01						
		661.62	1.123E-01	(	6.049E-02	2.48E-02	G
CE-139	-1.9627E-02						
		165.85	-1.963E-02	%(P	5.541E-02	1.67E-02	G
EU-152	-1.4262E-02						
		121.78	-1.426E-02	%(	1.505E-01	4.49E-02	G K
		344.30	3.879E-03	&	1.568E-01	4.58E-02	G
		1408.08	0.000E+00	%	2.985E-01	8.17E-02	G
		964.00	3.238E-01	&	4.387E-01	1.38E-01	G
		1112.07	1.834E-01	%	4.100E-01	1.24E-01	G
		778.90	-3.426E-02	%	3.550E-01	1.01E-01	G
EU-154	9.4661E-04						
		123.10	9.466E-04	%(	1.082E-01	3.22E-02	G K
		1274.80	-4.062E-03	&	2.073E-01	5.83E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	-8.477E-02	&	3.221E-01	9.54E-02	G
		1004.80	-8.689E-02	%	3.547E-01	1.04E-01	G
EU-155	1.5403E-02						
		86.45	1.540E-02	&(	1.828E-01	5.47E-02	G K
		105.31	6.198E-02	%	2.146E-01	6.46E-02	G
HG-203	1.5539E-02						
		279.17	1.554E-02	%(P	5.340E-02	1.59E-02	G K
		72.87	-5.101E-01	%	1.352E+00	4.09E-01	G
		70.83	-1.472E+00	&	2.413E+00	7.35E-01	G
		82.50	-2.394E+00	+	2.908E+00	8.93E-01	G
TL-208	2.9251E-01						
		583.14	2.925E-01	(	4.482E-02	2.33E-02	G
		510.72	3.676E-01	+	1.860E-01	7.08E-02	G
PB-212	7.0127E-01						
		238.63	6.825E-01	(	1.041E-01	4.06E-02	G K
							Energy duplication
		77.11	8.132E-01	+	3.608E-01	1.16E-01	G
		74.81	7.857E-01	&(	7.437E-01	2.30E-01	G
PB-214	4.9213E-01						
		351.99	5.009E-01	@(	1.019E-01	4.16E-02	G K
		295.22	4.751E-01	@(	1.915E-01	6.67E-02	G
							Energy duplication
		77.11	1.330E+00	+	5.901E-01	1.90E-01	G
		241.92	-2.303E-01	%	7.513E-01	2.26E-01	G
BI-212	7.1503E-01						
		727.17	7.150E-01	(	3.346E-01	1.37E-01	G K
		1620.56	1.543E+00	+	1.195E+00	5.28E-01	G
		785.42	1.141E+00	%	2.323E+00	7.06E-01	G
BI-214	5.9120E-01						
		609.32	5.588E-01	@(	1.053E-01	5.20E-02	G K
		1764.51	6.849E-01	(	1.294E-01	1.10E-01	G
		1120.28	8.154E-01	+	4.801E-01	2.10E-01	G
RA-224	1.3641E+00						
		241.00	1.364E+00	(	1.098E+00	3.47E-01	G
RA-226	1.4050E+00						
		185.99	1.405E+00	(	1.235E+00	3.87E-01	G
AC-228	1.0695E+00						
		911.07	1.069E+00	(	2.008E-01	1.05E-01	G K
		968.90	7.414E-01	-	2.758E-01	1.15E-01	G
		338.40	7.954E-01	-	2.828E-01	1.08E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-1.5243E-01						
		236.00	-1.524E-01	%(	5.001E-01	1.51E-01	G K
		256.25	1.971E-01	%	4.989E-01	1.50E-01	G
PA-234	3.1627E-02						
		98.44	3.163E-02	%(	1.896E-01	5.68E-02	G K
		946.00	6.436E-02	&	2.396E-01	6.99E-02	G
		131.28	1.797E-02	&	2.295E-01	6.85E-02	G
		94.67	-1.236E-01	%	3.565E-01	1.08E-01	G
		883.24	-4.991E-02	%	4.064E-01	1.16E-01	G
		926.70	0.000E+00	&	4.281E-01	1.18E-01	G
		569.26	8.631E-02	%	4.143E-01	1.21E-01	G
TH-234	1.3825E+00						
		63.29	6.387E-01	&(	2.217E+00	6.67E-01	G K
		92.80	1.785E+00	(	1.755E+00	5.43E-01	G
		92.38	2.042E+00	(	2.088E+00	6.44E-01	G
AM-241	-5.7198E-02						
		59.54	-5.720E-02	%(P	3.027E-01	9.07E-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

- -

***** 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	3.2993E-04	3.6683E-04	2.7401E-01	2.7401E-01	2.932E-01
K-40		1.6203E+01	1.6203E+01	1.8181E+00	2.0356E+00	
MN-54	#A	1.3290E-02	1.3533E-02	4.8598E-02	4.8604E-02	5.431E-02
CO-57	#B	-3.1240E-04	-3.1901E-04	1.9651E-01	1.9651E-01	5.103E-02
CO-60	#B	3.7904E-03	3.8015E-03	4.2131E-02	4.2132E-02	5.460E-02
Sr-85	#A	-2.4765E-02	-2.7024E-02	5.6464E-02	5.6485E-02	5.711E-02
Kr-85	#A	-5.7172E+02	-5.7175E+02	1.1946E+03	1.1951E+03	1.318E+03
Y-88	#B	-9.4819E-03	-9.9990E-03	5.2225E-02	5.2228E-02	5.207E-02
NB-94	#B	-9.0529E-04	-9.0529E-04	4.1904E-02	4.1904E-02	4.993E-02
Ag-108M	#B	-1.5815E-02	-1.5817E-02	5.8584E-02	5.8591E-02	6.624E-02
CD-109	#A	-5.8105E-01	-5.8836E-01	1.2758E+00	1.2762E+00	1.388E+00
SN-113	#B	-3.3222E-03	-3.4897E-03	1.4274E-01	1.4274E-01	6.749E-02
SB-125	#B	9.6959E-02	9.7503E-02	1.0163E-01	1.0178E-01	1.427E-01
I-131	#B	-1.0841E-02	-2.1919E-02	8.7715E-02	8.7724E-02	4.883E-02
CS-134	#B	-3.5322E-02	-3.5588E-02	6.4832E-02	6.4863E-02	7.061E-02
CS-137		1.1225E-01	1.1231E-01	7.4386E-02	7.4657E-02	
CE-139	#A	-1.8836E-02	-1.9627E-02	5.0448E-02	5.0460E-02	5.317E-02
EU-152	#B	-1.4245E-02	-1.4262E-02	1.3479E-01	1.3480E-01	1.503E-01
EU-154	#B	9.4489E-04	9.4661E-04	9.6560E-02	9.6560E-02	1.080E-01
EU-155	#B	1.5355E-02	1.5403E-02	1.6413E-01	1.6414E-01	1.822E-01
HG-203	#B	1.3761E-02	1.5539E-02	4.7680E-02	4.7689E-02	4.729E-02
TL-208		2.9251E-01	2.9251E-01	6.9959E-02	7.1885E-02	
PB-212	#	7.0127E-01	7.0127E-01	1.2523E-01	1.3134E-01	1.041E-01
PB-214	#	4.9213E-01	4.9213E-01	1.2033E-01	1.2350E-01	1.019E-01
BI-212		7.1503E-01	7.1503E-01	4.1227E-01	4.1424E-01	
BI-214		5.9120E-01	5.9120E-01	1.6428E-01	1.6765E-01	
RA-224		1.3641E+00	1.3641E+00	1.0417E+00	1.0445E+00	
RA-226	#	1.4050E+00	1.4050E+00	1.1599E+00	1.1626E+00	1.235E+00
AC-228		1.0695E+00	1.0695E+00	3.1501E-01	3.2075E-01	
TH-227	#B	-1.5243E-01	-1.5243E-01	4.5166E-01	4.5174E-01	5.001E-01
PA-234	#B	3.1627E-02	3.1627E-02	1.7045E-01	1.7046E-01	1.896E-01
TH-234	#B	1.3825E+00	1.3825E+00	1.2612E+00	1.2635E+00	2.217E+00
AM-241	#A	-5.7196E-02	-5.7198E-02	2.7767E-01	2.7769E-01	3.027E-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

Yankee Chemistry Spectrum name: 1-1F_14DEC2004_1750.An1

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

Total Activity (269.6 to 1999.1 keV) 2.0348120E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 2.0348177E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 1-1f_23dec2004_1310.An1

Sample description
Detector 101 FSS-OOL-04-01-008-F

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\1-1f_23dec2004_1310.An1

Acquisition information

Start time:	23-Dec-2004 13:03:19
Live time:	2000
Real time:	2002
Dead time:	0.12 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration

Filename:	D1_1LSa.Clb

Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

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

Efficiency Calibration

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

Library Files

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

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.0190E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.0190E+03) = 9.8135E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 1-1f_23dec2004_1310.An1

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	03-Dec-2004 13:38:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1888

***** 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	217.	19.79	1.50	1.654E-02				
74.81	217.	19.79	1.50	1.654E-02	74.81	9.600	1.811E+00	PB212
77.04	268.	15.59	1.50	1.720E-02	77.11	17.500	1.179E+00	PB212
					77.11	10.700	1.928E+00	PB214
77.04	268.	15.59	1.50	1.720E-02	77.11	17.500	1.179E+00	PB212
					77.11	10.700	1.928E+00	PB214
87.10	137.	26.53	1.50	1.932E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	2.557E+00	CD109
87.25	133.	28.65	1.50	1.910E-02	86.45	32.740	2.846E-01	EU155
					88.04	3.790	2.486E+00	CD109
92.98	137.	27.38	1.50	1.985E-02	92.38	2.570	3.559E+00	TH234
					92.80	3.000	3.042E+00	TH234
93.01	140.	25.98	1.50	1.989E-02	92.38	2.570	3.652E+00	TH234
					92.80	3.000	3.122E+00	TH234
129.07	87.	30.31	0.72	2.110E-02				
186.03	110.	21.91	0.81	1.858E-02	185.99	3.280	2.398E+00	RA226
209.25	76.	38.10	0.98	1.722E-02				
238.68	641.	4.53	1.12	1.557E-02				
238.68	641.	4.53	1.12	1.557E-02	238.63	43.100	1.267E+00	PB212
240.33	67.	41.55	1.50	1.540E-02	241.00	3.900	1.477E+00	RA224
					241.92	7.470	7.734E-01	PB214
269.86	59.	33.33	0.91	1.402E-02				
295.32	164.	11.84	0.97	1.292E-02	295.22	19.200	8.757E-01	PB214
328.34	50.	33.50	1.07	1.168E-02				
338.20	169.	14.19	1.01	1.136E-02	338.40	12.010	1.648E+00	AC228
351.85	338.	8.16	1.22	1.093E-02				

351.85	338.	8.16	1.22	1.093E-02	351.99	37.100	1.106E+00	PB214
510.49	99.	15.65	0.99	7.594E-03	510.72	22.500	7.711E-01	TL208
583.00	201.	8.56	1.32	6.686E-03	583.14	86.000	4.641E-01	TL208
609.05	207.	10.58	1.24	6.415E-03	609.32	46.090	9.270E-01	BI214
661.57	151.	13.18	1.08	5.938E-03	661.62	84.620	3.991E-01	CS137
727.08	35.	26.95	1.50	5.443E-03	727.17	11.800	7.266E-01	BI212

Yankee Chemistry Spectrum name: 1-1f_23dec2004_1310.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
910.93	96.	12.87	1.58	4.447E-03	911.07	29.000	9.894E-01	AC228
968.38	108.	14.86	1.22	4.214E-03	968.90	17.460	1.944E+00	AC228
1120.07	85.	19.47	0.76	3.711E-03	1120.28	15.040	2.020E+00	BI214
1460.38	466.	4.84	1.67	2.943E-03	1460.75	10.700	1.963E+01	K40
1764.07	36.	18.91	1.01	2.481E-03	1764.51	15.920	1.215E+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
257.75	129.07	280.	95.	0.047	80.95	0.722	AC-228 s
418.17	209.25	286.	76.	0.038	114.31	0.983	AC-228
477.05	238.63	102.	641.	0.321	13.60	1.122	PB-212 D
483.33	241.76	117.	119.	0.059	47.52	1.124	PB-214 lD
483.33	241.76	117.	119.	0.059	47.52	1.124	XE-138 D
539.44	269.86	139.	59.	0.030	100.00	0.913	AC-228 s
656.46	328.34	95.	50.	0.025	100.49	1.066	RH-106M

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

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.20	74.81	812.	217.	0.108	59.36	1.499
PB-212	153.79	77.11	737.	268.	0.134	46.77	1.499D
PB-214	153.79	77.11	737.	268.	0.134	46.77	1.499D
EU-155	174.08	87.25	661.	133.	0.067	85.96	1.499
CD-109	173.78	87.10	592.	137.	0.068	79.59	1.499
TH-234	185.55	92.98	634.	137.	0.068	82.15	1.499s
TH-234	185.59	93.01	596.	140.	0.070	77.95	1.499s
RA-226	371.79	186.07	306.	104.	0.052	76.87	1.499
PB-212	476.96	238.63	262.	425.	0.212	21.76	1.499D
RA-224	482.82	241.56	346.	97.	0.048	86.96	1.499
PB-214	480.37	240.33	355.	67.	0.034	124.66	1.499
PB-214	590.31	295.28	143.	151.	0.076	41.53	1.499
AC-228	676.18	338.20	128.	169.	0.085	42.57	1.009s
PB-214	703.45	351.82	84.	300.	0.150	21.62	1.499
TL-208	1020.93	510.49	53.	99.	0.050	46.96	0.989s
TL-208	1166.01	583.00	37.	201.	0.101	25.69	1.317s
BI-214	1218.13	609.05	75.	207.	0.103	31.75	1.238

Yankee Chemistry Spectrum name: 1-1f_23dec2004_1310.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CS-137	1323.23	661.57	70.	151.	0.075	39.54	1.079s
BI-212	1454.32	727.08	27.	35.	0.018	80.84	1.499s
AC-228	1822.20	910.93	24.	96.	0.048	38.61	1.584
AC-228	1937.17	968.38	39.	108.	0.054	44.59	1.218
BI-214	2240.74	1120.07	42.	85.	0.043	58.42	0.758s
K-40	2921.77	1460.38	10.	466.	0.233	14.52	1.671
BI-214	3529.58	1764.07	3.	36.	0.018	56.72	1.010s

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		1.8103E-02						
			477.56	1.810E-02	%(	6.802E-01	1.90E-01	G
K-40		1.9633E+01						
			1460.75	1.963E+01	(	7.317E-01	9.50E-01	G
MN-54		3.5619E-03						
			834.81	3.562E-03	%(	8.901E-02	2.48E-02	G
CO-57		-1.0178E-03						
			122.07	-1.018E-03	%(P	7.727E-02	2.28E-02	G K
			136.43	-1.396E-01	%	6.355E-01	1.90E-01	G
CO-60		2.6316E-02						
			1332.51	2.632E-02	%(P	9.071E-02	2.40E-02	G K
			1173.23	1.547E-03	% P	1.200E-01	3.19E-02	G K
Sr-85		-4.7145E-02						
			514.00	-4.715E-02	%(	1.178E-01	3.54E-02	G
Kr-85		-8.7931E+02						
			513.99	-8.793E+02	%(	2.197E+03	6.61E+02	G
Y-88		-2.3596E-03						
			1836.01	-2.360E-03	%(P	8.635E-02	2.06E-02	G K
			898.02	-2.253E-02	% P	1.054E-01	2.99E-02	G
NB-94		-3.0692E-03						
			871.10	-3.069E-03	%(	7.497E-02	2.06E-02	G K
			702.50	6.881E-03	%	6.160E-02	1.72E-02	G K

Yankee Chemistry Spectrum name: 1-1f_23dec2004_1310.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-3.1701E-02						
		722.95	-3.170E-02	&(	1.196E-01	3.53E-02	G K
		614.37	-1.349E-02	&	7.615E-02	2.19E-02	G
		433.93	1.766E-03	&	8.736E-02	2.52E-02	G
CD-109	2.5573E+00						
		88.04	2.557E+00	(	2.167E+00	6.78E-01	G
SN-113	-3.3355E-02						
		391.71	-3.336E-02	%(P	1.182E-01	3.48E-02	G K
		255.04	-6.626E-01	%	3.091E+00	9.16E-01	G
SB-125	-4.7492E-02						
		427.95	-4.749E-02	%(	2.125E-01	6.23E-02	G K
		600.77	7.946E-03	%	3.984E-01	1.12E-01	G
		636.15	4.204E-03	%	6.996E-01	1.96E-01	G
		463.51	3.396E-01	%	5.997E-01	1.84E-01	G
		176.29	1.183E-01	%	1.047E+00	3.11E-01	G
I-131	1.2076E-03						
		364.48	1.208E-03	&(	4.222E-01	1.21E-01	G K
		636.97	-1.047E-02	%	6.052E+00	1.70E+00	G
		284.29	2.645E-02	%	4.286E+00	1.23E+00	G
CS-134	-1.5403E-02						
		604.66	-1.540E-02	%(	9.555E-02	2.78E-02	G K
		795.76	6.585E-02	%	8.955E-02	2.85E-02	G
		569.29	0.000E+00	%	5.042E-01	1.42E-01	G
		801.84	2.077E-01	%	8.230E-01	2.38E-01	G
CS-137	3.9907E-01						
		661.62	3.991E-01	@(	1.102E-01	5.26E-02	G
CE-139	2.9485E-03						
		165.85	2.949E-03	%(P	8.985E-02	2.66E-02	G
EU-152	0.0000E+00						
		121.78	0.000E+00	%(	2.159E-01	6.37E-02	G K
		344.30	6.318E-02	%	1.987E-01	5.91E-02	G
		1408.08	5.632E-02	%	3.484E-01	9.51E-02	G
		964.00	4.329E-01	%	7.138E-01	2.21E-01	G
		1112.07	-3.036E-03	&	7.158E-01	1.96E-01	G
		778.90	-1.072E-01	%	6.371E-01	1.83E-01	G
EU-154	1.5222E-02						
		123.10	1.522E-02	%(	1.564E-01	4.64E-02	G K
		1274.80	5.250E-03	%	2.932E-01	8.00E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	-1.463E-01	&	5.460E-01	1.61E-01	G
		1004.80	-1.065E-01	&	5.673E-01	1.63E-01	G
EU-155	2.8460E-01						
		86.45	2.846E-01	(	2.619E-01	8.16E-02	G K
		105.31	4.518E-02	%	3.061E-01	9.12E-02	G
HG-203	2.5989E-02						
		279.17	2.599E-02	&(P	1.076E-01	3.18E-02	G K
		72.87	-9.607E-01	%	2.759E+00	8.33E-01	G
		70.83	1.188E+00	%	3.628E+00	1.09E+00	G
		82.50	-4.604E-02	&	6.293E+00	1.87E+00	G
TL-208	4.6415E-01						
		583.14	4.641E-01	@(	7.147E-02	3.97E-02	G
		510.72	7.711E-01	+	2.837E-01	1.21E-01	G
PB-212	8.3947E-01						
							Energy duplication
		238.63	8.395E-01	(	1.545E-01	6.09E-02	G K
							Energy duplication
		77.11	1.179E+00	+	5.690E-01	1.84E-01	G
		74.81	1.811E+00	&	1.132E+00	3.58E-01	G
PB-214	9.8247E-01						
		351.99	9.825E-01	(	1.486E-01	7.08E-02	G K
		295.22	8.082E-01	-	3.128E-01	1.12E-01	G
							Energy duplication
		77.11	1.928E+00	+	9.307E-01	3.01E-01	G
		241.92	7.734E-01	-	1.043E+00	3.21E-01	G
BI-212	7.2659E-01						
		727.17	7.266E-01	@(	5.593E-01	1.96E-01	G K
		1620.56	9.728E-01	%	2.440E+00	7.25E-01	G
		785.42	1.638E+00	%	3.567E+00	1.08E+00	G
BI-214	9.2700E-01						
		609.32	9.270E-01	(	1.937E-01	9.81E-02	G K
		1764.51	1.215E+00	+	3.528E-01	2.30E-01	G
		1120.28	2.020E+00	+	7.820E-01	3.93E-01	G
RA-224	2.1318E+00						
		241.00	2.132E+00	(	1.967E+00	6.18E-01	G
RA-226	2.2717E+00						
		185.99	2.272E+00	(	1.832E+00	5.82E-01	G
AC-228	9.8936E-01						
		911.07	9.894E-01	(	2.617E-01	1.27E-01	G K
		968.90	1.944E+00	+	5.750E-01	2.89E-01	G
		338.40	1.648E+00	+	5.385E-01	2.34E-01	G

Yankee Chemistry Spectrum name: 1-1f_23dec2004_1310.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	8.0203E-03						
		236.00	8.020E-03	%(	6.708E-01	1.98E-01	G K
		256.25	2.536E-01	%	8.671E-01	2.59E-01	G
PA-234	5.5161E-03						
		98.44	5.516E-03	%(	3.015E-01	8.94E-02	G K
		946.00	1.565E-01	&	3.356E-01	1.02E-01	G
		131.28	-6.666E-02	&	3.534E-01	1.06E-01	G
		94.67	-1.836E-01	%	4.976E-01	1.50E-01	G
		883.24	-1.440E-02	%	5.729E-01	1.55E-01	G
		926.70	2.512E-01	%	6.826E-01	2.02E-01	G
		569.26	0.000E+00	%	7.344E-01	2.08E-01	G
TH-234	2.6979E+00						
		63.29	1.805E+00	%(	3.414E+00	1.04E+00	G K
		92.80	3.122E+00	(	2.588E+00	8.11E-01	G
		92.38	3.559E+00	&(	3.121E+00	9.74E-01	G
AM-241	-1.9400E-02						
		59.54	-1.940E-02	&(P	4.374E-01	1.29E-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

Yankee Chemistry Spectrum name: 1-1f_23dec2004_1310.An1

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	1.3968E-02	1.8103E-02	5.7144E-01	5.7144E-01	5.249E-01
K-40		1.9633E+01	1.9633E+01	2.8500E+00	3.0582E+00	
MN-54	#A	3.4074E-03	3.5619E-03	7.4540E-02	7.4540E-02	8.515E-02
CO-57	#B	-9.6691E-04	-1.0178E-03	1.8042E-01	1.8042E-01	7.340E-02
CO-60	#B	2.6128E-02	2.6316E-02	7.2043E-02	7.2059E-02	9.006E-02
Sr-85	#A	-3.8080E-02	-4.7145E-02	1.0631E-01	1.0635E-01	9.515E-02
Kr-85	#A	-8.7918E+02	-8.7931E+02	1.9827E+03	1.9833E+03	2.197E+03
Y-88	#B	-2.0722E-03	-2.3596E-03	3.0676E-01	3.0676E-01	7.583E-02
NB-94	#B	-3.0691E-03	-3.0692E-03	6.1824E-02	6.1825E-02	7.497E-02
Ag-108M	#B	-3.1692E-02	-3.1701E-02	1.0599E-01	1.0601E-01	1.196E-01
CD-109	#	2.4804E+00	2.5573E+00	2.0354E+00	2.0403E+00	2.102E+00
SN-113	#B	-2.9574E-02	-3.3355E-02	1.2373E-01	1.2374E-01	1.048E-01
SB-125	#B	-4.6847E-02	-4.7492E-02	1.8688E-01	1.8690E-01	2.096E-01
I-131	#B	2.1577E-04	1.2076E-03	3.6313E-01	3.6313E-01	7.543E-02
CS-134	#B	-1.5122E-02	-1.5403E-02	8.3505E-02	8.3510E-02	9.381E-02
CS-137	#	3.9856E-01	3.9907E-01	1.5777E-01	1.5938E-01	
CE-139	#A	2.6661E-03	2.9485E-03	7.9654E-02	7.9655E-02	8.124E-02
EU-152	#B	0.0000E+00	0.0000E+00	1.9122E-01	1.9122E-01	2.152E-01
EU-154	#B	1.5154E-02	1.5222E-02	1.3934E-01	1.3935E-01	1.557E-01
EU-155	#	2.8244E-01	2.8460E-01	2.4466E-01	2.4517E-01	2.599E-01
HG-203	#B	1.9307E-02	2.5989E-02	9.5330E-02	9.5342E-02	7.992E-02
TL-208	#	4.6415E-01	4.6415E-01	1.1925E-01	1.2209E-01	
PB-212	#	8.3947E-01	8.3947E-01	1.8267E-01	1.8872E-01	1.545E-01
PB-214	#	9.8247E-01	9.8247E-01	2.1242E-01	2.1956E-01	1.486E-01
BI-212	#	7.2659E-01	7.2659E-01	5.8737E-01	5.8880E-01	5.593E-01
BI-214		9.2700E-01	9.2700E-01	2.9431E-01	2.9893E-01	
RA-224	#	2.1318E+00	2.1318E+00	1.8537E+00	1.8577E+00	1.967E+00
RA-226	#	2.2716E+00	2.2717E+00	1.7462E+00	1.7509E+00	1.832E+00
AC-228		9.8936E-01	9.8936E-01	3.8203E-01	3.8610E-01	
TH-227	#B	8.0203E-03	8.0203E-03	5.9255E-01	5.9255E-01	6.708E-01
PA-234	#B	5.5161E-03	5.5161E-03	2.6832E-01	2.6832E-01	3.015E-01
TH-234	#B	2.6979E+00	2.6979E+00	1.8559E+00	1.8619E+00	3.414E+00
AM-241	#A	-1.9398E-02	-1.9400E-02	4.3544E-01	4.3544E-01	4.373E-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

Yankee Chemistry Spectrum name: 1-1f_23dec2004_1310.An1

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

Total Activity (269.6 to 1999.1 keV) 2.2411703E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 2.2412205E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Chemistry/RP Detector 104 Spectrum name: 101_16DEC2004_1910.An1

Sample description
Detector 101 FSS_OOL-04-01-020-F-R WET

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101_16DEC2004_1910.An1

Acquisition information
Start time: 16-Dec-2004 19:03:07
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: 1.7500E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7500E+03) =
5.7143E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Chemistry/RP Detector 104 Spectrum name: 101_16DEC2004_1910.An1

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	15-Dec-2004 13:15:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1928

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.73	181.	24.33	1.50	1.654E-02				
74.73	181.	24.33	1.50	1.654E-02	74.81	9.600	8.805E-01	PB212
77.05	236.	17.94	1.50	1.720E-02	77.11	10.700	9.881E-01	PB214
					77.11	17.500	6.042E-01	PB212
77.05	236.	17.94	1.50	1.720E-02	77.11	10.700	9.881E-01	PB214
					77.11	17.500	6.042E-01	PB212
93.11	99.	37.00	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.279E+00	TH234
93.13	97.	38.37	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.257E+00	TH234
185.80	75.	30.44	0.62	1.859E-02				
185.80	75.	30.44	0.62	1.859E-02	185.99	3.280	9.477E-01	RA226
209.87	110.	22.92	1.46	1.718E-02				
238.67	677.	4.39	1.12	1.558E-02				
238.67	677.	4.39	1.12	1.558E-02	238.63	43.100	7.793E-01	PB212
241.48	101.	19.07	1.12	1.543E-02	241.00	3.900	1.288E+00	RA224
					241.92	7.470	6.746E-01	PB214
270.01	52.	39.57	1.27	1.401E-02				
295.44	119.	13.41	1.16	1.291E-02	295.22	19.200	3.696E-01	PB214
300.16	59.	22.30	1.16	1.272E-02				
328.10	49.	34.87	1.07	1.169E-02				
338.46	118.	16.45	1.28	1.135E-02	338.40	12.010	6.673E-01	AC228
351.75	206.	11.19	1.26	1.093E-02				
351.75	206.	11.19	1.26	1.093E-02	351.99	37.100	3.925E-01	PB214
462.57	32.	41.66	0.65	8.358E-03				
462.57	32.	41.66	0.65	8.358E-03	463.51	10.000	3.002E-01	SB125

510.82	106.	18.41	1.62	7.589E-03	510.72	22.500	4.811E-01	TL208
583.11	220.	9.72	1.21	6.685E-03				
583.11	220.	9.72	1.21	6.685E-03	583.14	86.000	2.957E-01	TL208
609.34	122.	11.27	1.73	6.412E-03	609.32	46.090	3.187E-01	BI214
661.71	84.	22.74	1.28	5.937E-03	661.62	84.620	1.291E-01	CS137
727.56	57.	22.57	1.31	5.440E-03	727.17	11.800	6.889E-01	BI212
794.68	24.	36.88	1.50	5.016E-03	795.76	85.400	PBC<MDA	CS134
859.66	44.	24.21	1.55	4.681E-03				
910.95	133.	9.92	1.24	4.447E-03	911.07	29.000	7.941E-01	AC228
968.11	81.	16.03	2.12	4.215E-03	968.90	17.460	8.505E-01	AC228

Chemistry/RP Detector 104 Spectrum name: 101_16DEC2004_1910.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1120.45	39.	22.59	1.52	3.711E-03	1120.28	15.040	5.341E-01	BI214
1460.64	305.	5.88	1.83	2.943E-03	1460.75	10.700	7.485E+00	K40
1763.67	24.	20.41	1.29	2.481E-03	1764.51	15.920	4.691E-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	
371.26	185.80	211.	75.	0.037	91.31	0.616	U-235	l
419.41	209.87	220.	110.	0.055	68.75	1.461	NP-239	s
477.04	238.59	104.	677.	0.339	13.18	1.122	PB-212	D
482.66	241.40	133.	101.	0.050	57.22	1.123	RA-224	D
539.75	270.01	146.	52.	0.026	118.70	1.266	AC-228	
600.08	300.16	86.	46.	0.023	96.29	0.662	PB-212	s
655.98	328.10	99.	49.	0.024	104.60	1.068	AC-228	
925.03	462.57	58.	32.	0.016	124.97	0.652	CS-138	l
1719.61	859.66	19.	44.	0.022	72.64	1.545	TL-208	s

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

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.03	74.73	879.	181.	0.091	72.98	1.499s
PB-214	153.79	77.11	775.	236.	0.118	53.82	1.499D
PB-212	153.79	77.11	775.	236.	0.118	53.82	1.499D
TH-234	185.85	93.13	646.	97.	0.049	115.11	1.499
TH-234	185.80	93.11	619.	99.	0.049	111.00	1.499
PB-212	477.11	238.70	284.	508.	0.254	19.36	1.499
PB-214	590.65	295.45	179.	110.	0.055	58.87	1.499
AC-228	676.70	338.46	99.	118.	0.059	49.36	1.283
PB-214	703.66	351.93	82.	174.	0.087	31.63	1.499
TL-208	1021.54	510.80	62.	82.	0.041	52.73	1.499s
TL-208	1166.28	583.13	36.	194.	0.097	25.24	1.499
BI-214	1218.71	609.34	28.	122.	0.061	33.82	1.727s
CS-137	1323.50	661.71	78.	84.	0.042	68.21	1.281
BI-212	1455.27	727.56	30.	57.	0.029	67.70	1.307s
CS-134	1589.58	794.68	28.	24.	0.012	110.65	1.502s
AC-228	1822.25	910.95	14.	133.	0.066	29.75	1.238s
AC-228	1936.64	968.11	25.	81.	0.041	48.08	2.121s

Chemistry/RP Detector 104 Spectrum name: 101_16DEC2004_1910.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	2241.50	1120.45	14.	39.	0.019	67.77	1.523
K-40	2922.30	1460.64	5.	305.	0.153	17.63	1.828
BI-214	3528.77	1763.67	0.	24.	0.012	61.24	1.291s

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

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

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		8.0844E-02					
			477.56	8.084E-02	%(	3.701E-01 1.08E-01	G
K-40		7.4855E+00					
			1460.75	7.485E+00	(	3.169E-01 4.40E-01	G
MN-54		1.8960E-03					
			834.81	1.896E-03	&(	4.295E-02 1.18E-02	G
CO-57		-1.2494E-02					
			122.07	-1.249E-02	%(P	4.742E-02 1.42E-02	G K
			136.43	-6.951E-03	&	3.013E-01 8.87E-02	G
CO-60		-8.0905E-03					
			1332.51	-8.091E-03	%(P	5.641E-02 1.31E-02	G K
			1173.23	-2.535E-03	% P	5.897E-02 1.49E-02	G K
Sr-85		-2.0388E-02					
			514.00	-2.039E-02	%(	5.848E-02 1.75E-02	G
Kr-85		-4.6446E+02					
			513.99	-4.645E+02	%(	1.332E+03 3.99E+02	G
Y-88		-3.6587E-04					
			1836.01	-3.659E-04	&(P	5.928E-02 1.52E-02	G K
			898.02	-9.041E-03	% P	4.912E-02 1.37E-02	G
NB-94		-4.7047E-04					
			871.10	-4.705E-04	&(	4.356E-02 1.19E-02	G K
			702.50	-1.663E-04	%	3.333E-02 9.00E-03	G K
Ag-108M		-8.0417E-03					
			722.95	-8.042E-03	%(	4.822E-02 1.38E-02	G K
			614.37	-4.057E-03	%	4.933E-02 1.41E-02	G
			433.93	8.730E-03	&	3.644E-02 1.07E-02	G

Chemistry/RP Detector 104 Spectrum name: 101_16DEC2004_1910.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	4.0319E-01						
		88.04	4.032E-01	%(	1.312E+00	3.95E-01	G
SN-113	-1.4786E-03						
		391.71	-1.479E-03	&(P	6.567E-02	1.88E-02	G K
		255.04	-1.687E-02	&	1.727E+00	5.03E-01	G
SB-125	3.4728E-02						
		427.95	3.473E-02	&(	1.041E-01	3.09E-02	G K
		600.77	7.543E-03	&	1.975E-01	5.51E-02	G
		636.15	7.708E-02	&	3.223E-01	9.33E-02	G
		463.51	2.345E-01	%	3.266E-01	1.03E-01	G
		176.29	-3.380E-02	%	5.361E-01	1.58E-01	G
I-131	2.7667E-03						
		364.48	2.767E-03	&(	4.880E-02	1.41E-02	G K
		636.97	1.694E-02	%	5.864E-01	1.63E-01	G
		284.29	9.273E-02	&	5.997E-01	1.76E-01	G
CS-134	1.7220E-02						
		604.66	-6.257E-03	&(	4.471E-02	1.29E-02	G K
		795.76	4.405E-02	@(	4.965E-02	1.62E-02	G
		569.29	1.369E-01	%	2.118E-01	6.63E-02	G
		801.84	-9.039E-02	&	6.034E-01	1.73E-01	G
CS-137	1.2911E-01						
		661.62	1.291E-01	(	6.742E-02	2.94E-02	G
CE-139	1.1090E-03						
		165.85	1.109E-03	&(P	4.661E-02	1.38E-02	G
EU-152	1.8555E-02						
		121.78	1.856E-02	%(	9.486E-02	2.82E-02	G K
		344.30	-1.667E-02	&	1.301E-01	3.79E-02	G
		1408.08	8.103E-02	%	2.619E-01	7.63E-02	G
		964.00	1.823E-01	%	4.106E-01	1.24E-01	G
		1112.07	1.452E-01	%	3.571E-01	1.07E-01	G
		778.90	2.468E-02	%	3.033E-01	8.42E-02	G
EU-154	-9.2153E-04						
		123.10	-9.215E-04	&(	9.443E-02	2.79E-02	G K
		1274.80	-1.648E-02	&	1.620E-01	4.50E-02	G
		723.30	-3.685E-02	%	2.190E-01	6.27E-02	G
		1004.80	-4.883E-02	%	3.145E-01	8.96E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.1539E-02						
		86.45	1.154E-02	%(	1.388E-01	4.13E-02	G K
		105.31	8.867E-02	%	1.790E-01	5.43E-02	G
HG-203	1.9946E-02						
		279.17	1.995E-02	%(P	3.768E-02	1.14E-02	G K
		72.87	-1.872E-01	%	1.155E+00	3.46E-01	G
		70.83	-4.588E-01	&	2.254E+00	6.77E-01	G
		82.50	-6.992E-01	%	2.401E+00	7.22E-01	G
TL-208	2.6035E-01						
		583.14	2.603E-01	(	4.124E-02	2.19E-02	G
		510.72	3.692E-01	+	1.783E-01	6.49E-02	G
PB-212	5.9040E-01						
		238.63	5.848E-01	(	9.344E-02	3.77E-02	G K
							Energy duplication
		77.11	6.042E-01	(	3.397E-01	1.08E-01	G
		74.81	8.805E-01	+	6.852E-01	2.14E-01	G
PB-214	3.3618E-01						
		351.99	3.325E-01	(	8.558E-02	3.51E-02	G K
		295.22	3.434E-01	(	2.026E-01	6.74E-02	G
							Energy duplication
		77.11	9.881E-01	+	5.556E-01	1.77E-01	G
		241.92	-6.625E-02	%	7.486E-01	2.23E-01	G
BI-212	6.8892E-01						
		727.17	6.889E-01	@(	3.379E-01	1.56E-01	G K
		1620.56	1.004E-01	%	1.586E+00	4.08E-01	G
		785.42	2.862E-01	%	1.647E+00	4.61E-01	G
BI-214	3.1875E-01						
		609.32	3.187E-01	*(	7.150E-02	3.59E-02	G K
		1764.51	4.691E-01	+	1.441E-01	9.57E-02	G
		1120.28	5.341E-01	+	2.822E-01	1.21E-01	G
RA-224	8.7616E-01						
		241.00	8.762E-01	%(	1.224E+00	3.76E-01	G
RA-226	7.4660E-01						
		185.99	7.466E-01	%(	1.121E+00	3.44E-01	G
AC-228	7.8489E-01						
		911.07	7.941E-01	@(	1.221E-01	7.87E-02	G K
		968.90	8.505E-01	(	2.731E-01	1.36E-01	G
		338.40	6.673E-01	(	2.783E-01	1.10E-01	G

Chemistry/RP Detector 104 Spectrum name: 101_16DEC2004_1910.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-4.6701E-03						
		236.00	-4.670E-03	%(	4.117E-01	1.21E-01	G K
		256.25	-4.887E-02	&	5.157E-01	1.51E-01	G
PA-234	-3.9357E-02						
		98.44	-3.936E-02	&(	1.560E-01	4.67E-02	G K
		946.00	-3.352E-03	&	2.223E-01	6.03E-02	G
		131.28	5.866E-02	&	1.896E-01	5.70E-02	G
		94.67	-4.476E-02	%	3.064E-01	9.15E-02	G
		883.24	-1.557E-02	%	3.295E-01	8.96E-02	G
		926.70	2.651E-02	%	4.224E-01	1.17E-01	G
		569.26	2.030E-01	%	3.138E-01	9.83E-02	G
TH-234	1.1350E+00						
		63.29	8.029E-01	%(	2.242E+00	6.76E-01	G K
		92.80	1.279E+00	(	1.536E+00	4.73E-01	G
		92.38	1.471E+00	(	1.834E+00	5.64E-01	G
AM-241	-1.0750E-02						
		59.54	-1.075E-02	%(P	2.979E-01	8.85E-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

Chemistry/RP Detector 104 Spectrum name: 101_16DEC2004_1910.An1

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	7.9551E-02	8.0844E-02	3.2447E-01	3.2450E-01	3.642E-01
K-40		7.4855E+00	7.4855E+00	1.3194E+00	1.3855E+00	
MN-54	#A	1.8908E-03	1.8960E-03	3.5513E-02	3.5513E-02	4.283E-02
CO-57	#B	-1.2454E-02	-1.2494E-02	4.6643E-02	4.6649E-02	4.727E-02
CO-60	#B	-8.0869E-03	-8.0905E-03	1.2296E-01	1.2297E-01	5.638E-02
Sr-85	#A	-2.0119E-02	-2.0388E-02	5.2518E-02	5.2531E-02	5.770E-02
Kr-85	#A	-4.6446E+02	-4.6446E+02	1.1964E+03	1.1967E+03	1.332E+03
Y-88	#B	-3.6292E-04	-3.6587E-04	1.2081E-01	1.2081E-01	5.880E-02
NB-94	#B	-4.7047E-04	-4.7047E-04	3.5638E-02	3.5638E-02	4.356E-02
Ag-108M	#B	-8.0416E-03	-8.0417E-03	4.1435E-02	4.1438E-02	4.822E-02
CD-109	#A	4.0243E-01	4.0319E-01	1.1847E+00	1.1849E+00	1.310E+00
SN-113	#B	-1.4676E-03	-1.4786E-03	1.3551E-01	1.3551E-01	6.518E-02
SB-125	#B	3.4698E-02	3.4728E-02	9.2623E-02	9.2644E-02	1.040E-01
I-131	#B	2.4858E-03	2.7667E-03	4.2258E-02	4.2258E-02	4.385E-02
CS-134	#B	1.7200E-02	1.7220E-02	1.9054E-02	1.9079E-02	4.466E-02
CS-137		1.2910E-01	1.2911E-01	8.8072E-02	8.8374E-02	
CE-139	#A	1.1021E-03	1.1090E-03	4.1272E-02	4.1272E-02	4.631E-02
EU-152	#B	1.8552E-02	1.8555E-02	8.4523E-02	8.4529E-02	9.484E-02
EU-154	#B	-9.2128E-04	-9.2153E-04	8.3788E-02	8.3788E-02	9.440E-02
EU-155	#B	1.1533E-02	1.1539E-02	1.2384E-01	1.2384E-01	1.387E-01
HG-203	#B	1.9581E-02	1.9946E-02	3.4115E-02	3.4134E-02	3.699E-02
TL-208	#	2.6035E-01	2.6035E-01	6.5723E-02	6.7349E-02	4.124E-02
PB-212	#	5.9040E-01	5.9040E-01	1.1430E-01	1.1907E-01	9.344E-02
PB-214	#	3.3618E-01	3.3618E-01	1.0635E-01	1.0803E-01	8.558E-02
BI-212	#	6.8892E-01	6.8892E-01	4.6638E-01	4.6800E-01	
BI-214		3.1875E-01	3.1875E-01	1.0781E-01	1.0931E-01	
RA-224	#A	8.7616E-01	8.7616E-01	1.1281E+00	1.1292E+00	1.224E+00
RA-226	#A	7.4660E-01	7.4660E-01	1.0316E+00	1.0324E+00	1.121E+00
AC-228		7.8489E-01	7.8489E-01	1.9637E-01	2.0131E-01	
TH-227	#B	-4.6701E-03	-4.6701E-03	3.6429E-01	3.6429E-01	4.117E-01
PA-234	#B	-3.9357E-02	-3.9357E-02	1.4021E-01	1.4023E-01	1.560E-01
TH-234	#B	1.1350E+00	1.1350E+00	1.1315E+00	1.1332E+00	2.242E+00
AM-241	#A	-1.0749E-02	-1.0750E-02	2.9927E-01	2.9927E-01	2.979E-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

Chemistry/RP Detector 104 Spectrum name: 101_16DEC2004_1910.An1

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

Total Activity (269.6 to 1999.1 keV) 9.4071445E+00 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 9.4071550E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Chemistry/RP Detector 104

Yankee Chemistry Spectrum name: 101F22DEC2004_1750.An1

Sample description
Detector 101 FSS-OOL-04-01-014-F

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F22DEC2004_1750.An1

Acquisition information
Start time: 22-Dec-2004 17:41:44
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: 1.3340E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.3340E+03) =
7.4963E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F22DEC2004_1750.An1

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	06-Dec-2004 11:51:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1899

***** 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
74.52	175.	16.84	1.00	1.651E-02				
74.52	175.	16.84	1.00	1.651E-02	74.81	9.600	1.118E+00	PB212
77.79	165.	18.87	1.01	1.743E-02	77.11	10.700	9.106E-01	PB214
					77.11	17.500	5.568E-01	PB212
92.82	123.	29.53	1.50	1.989E-02	92.38	2.570	2.448E+00	TH234
					92.80	3.000	2.092E+00	TH234
92.85	121.	30.53	1.50	1.985E-02	92.38	2.570	2.412E+00	TH234
					92.80	3.000	2.062E+00	TH234
186.24	92.	29.47	1.10	1.857E-02	185.99	3.280	1.532E+00	RA226
209.28	59.	31.78	1.06	1.722E-02				
238.72	618.	4.68	1.12	1.557E-02	238.63	43.100	9.328E-01	PB212
241.89	99.	19.29	1.12	1.540E-02	241.00	3.900	1.657E+00	RA224
					241.92	7.470	8.678E-01	PB214
295.19	203.	10.11	1.13	1.292E-02				
295.19	203.	10.11	1.13	1.292E-02	295.22	19.200	8.306E-01	PB214
300.41	52.	31.69	1.74	1.271E-02				
328.41	46.	32.51	1.58	1.168E-02				
338.28	132.	16.43	0.98	1.135E-02	338.40	12.010	9.825E-01	AC228
351.98	291.	8.08	1.16	1.092E-02				
351.98	291.	8.08	1.16	1.092E-02	351.99	37.100	7.276E-01	PB214
462.92	68.	22.46	0.74	8.352E-03				
462.92	68.	22.46	0.74	8.352E-03	463.51	10.000	8.350E-01	SB125
510.32	99.	16.42	1.45	7.596E-03	510.72	22.500	5.872E-01	TL208
582.91	171.	10.90	1.06	6.687E-03	583.14	86.000	3.013E-01	TL208
608.97	210.	9.89	1.37	6.416E-03	609.32	46.090	7.184E-01	BI214
661.29	43.	36.46	1.12	5.940E-03				

661.29	43.	36.46	1.12	5.940E-03	661.62	84.620	8.658E-02	CS137
727.49	43.	30.79	1.61	5.443E-03	727.17	11.800	6.814E-01	BI212
794.60	57.	23.59	0.91	5.023E-03				
911.39	114.	11.82	1.59	4.445E-03	911.07	29.000	8.979E-01	AC228
968.19	90.	15.52	1.84	4.215E-03	968.90	17.460	1.240E+00	AC228
1119.83	49.	28.22	1.47	3.711E-03	1120.28	15.040	8.948E-01	BI214
1460.47	530.	4.38	1.81	2.943E-03	1460.75	10.700	1.706E+01	K40
1619.92	11.	35.25	1.08	2.682E-03	1620.56	2.750	1.456E+00	BI212

Yankee Chemistry Spectrum name: 101F22DEC2004_1750.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1764.35	42.	15.43	1.42	2.481E-03	1764.51	15.920	1.077E+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	
418.24	209.28	156.	59.	0.030	95.34	1.058	AC-228	
477.15	238.77	109.	618.	0.309	14.03	1.122	PB-212	D
483.48	241.93	131.	99.	0.049	57.87	1.124	PB-214	D
600.58	300.41	98.	52.	0.026	90.04	1.744	PB-212	s
656.60	328.41	82.	46.	0.023	97.52	1.583	RH-106M	s
1589.43	794.60	34.	55.	0.027	60.54	0.907	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	149.39	74.91	825.	156.	0.078	81.58	1.499
PB-214	153.79	77.11	712.	273.	0.137	45.25	1.499D
PB-212	153.79	77.11	712.	273.	0.137	45.25	1.499D
TH-234	185.27	92.85	627.	121.	0.061	91.58	1.499
TH-234	185.21	92.82	601.	123.	0.062	88.58	1.499
RA-226	372.00	186.17	362.	94.	0.047	91.42	1.499
PB-212	477.06	238.68	331.	476.	0.238	21.25	1.499
RA-224	483.32	241.81	354.	92.	0.046	92.51	1.499
PB-214	590.31	295.28	123.	192.	0.096	32.66	1.499
AC-228	676.34	338.28	126.	132.	0.066	49.29	0.983
PB-214	703.54	351.87	82.	268.	0.134	23.27	1.499
SB-125	925.73	462.92	49.	40.	0.020	88.59	1.499s
TL-208	1020.57	510.32	57.	99.	0.049	49.26	1.447s
TL-208	1165.83	582.91	63.	171.	0.086	32.70	1.060s
BI-214	1217.97	608.97	59.	210.	0.105	29.66	1.373s
CS-137	1322.91	661.41	42.	32.	0.016	101.15	1.499
BI-212	1455.14	727.49	42.	43.	0.022	92.38	1.608
AC-228	1823.13	911.39	21.	114.	0.057	35.47	1.585
AC-228	1936.79	968.19	30.	90.	0.045	46.55	1.841s
BI-214	2240.25	1119.83	44.	49.	0.025	84.65	1.471
K-40	2921.95	1460.47	3.	530.	0.265	13.15	1.812
BI-212	3241.08	1619.92	1.	11.	0.005	105.74	1.081s

Yankee Chemistry Spectrum name: 101F22DEC2004_1750.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3530.14	1764.35	0.	42.	0.021	46.29	1.416s

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		3.8029E-02					
			477.56	3.803E-02	%(	5.860E-01 1.67E-01	G
K-40		1.7062E+01					
			1460.75	1.706E+01	(	3.336E-01 7.48E-01	G
MN-54		3.7567E-02					
			834.81	3.757E-02	%(	5.412E-02 1.72E-02	G
CO-57		1.7102E-02					
			122.07	1.710E-02	%(P	5.640E-02 1.69E-02	G K
			136.43	0.000E+00	%	5.280E-01 1.56E-01	G
CO-60		-1.5691E-03					
			1332.51	-1.569E-03	%(P	7.542E-02 1.84E-02	G K
			1173.23	1.009E-02	% P	1.004E-01 2.76E-02	G K
Sr-85		-3.8325E-02					
			514.00	-3.833E-02	%(	8.805E-02 2.66E-02	G
Kr-85		-7.4381E+02					
			513.99	-7.438E+02	%(	1.709E+03 5.16E+02	G
Y-88		1.5237E-03					
			1836.01	1.524E-03	%(P	5.553E-02 1.30E-02	G K
			898.02	1.620E-02	& P	6.464E-02 1.85E-02	G
NB-94		-8.4021E-03					
			871.10	-8.402E-03	%(	6.584E-02 1.87E-02	G K
			702.50	9.697E-03	%	4.761E-02 1.36E-02	G K
Ag-108M		-2.1780E-03					
			722.95	-2.178E-03	&(	1.165E-01 3.37E-02	G K
			614.37	-6.094E-03	%	5.425E-02 1.54E-02	G
			433.93	1.022E-02	%	4.647E-02 1.35E-02	G

Yankee Chemistry Spectrum name: 101F22DEC2004_1750.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	2.1080E-01						
		88.04	2.108E-01	&(	1.823E+00	5.44E-01	G
SN-113	5.7974E-03						
		391.71	5.797E-03	%(P	7.273E-02	2.08E-02	G K
		255.04	-2.908E-01	&	2.498E+00	7.35E-01	G
SB-125	1.2126E-01						
		427.95	-2.941E-03	%(	1.733E-01	4.96E-02	G K
		600.77	0.000E+00	%	3.442E-01	9.74E-02	G
		636.15	-8.702E-02	%	4.963E-01	1.43E-01	G
		463.51	4.889E-01	*(	4.346E-01	1.44E-01	G
		176.29	-3.202E-02	&	7.672E-01	2.26E-01	G
I-131	0.0000E+00						
		364.48	0.000E+00	&(	2.247E-01	6.42E-02	G K
		636.97	-4.903E-01	%	3.013E+00	8.65E-01	G
		284.29	5.969E-01	%	2.773E+00	8.18E-01	G
CS-134	-1.5050E-02						
		604.66	-1.505E-02	&(	7.826E-02	2.29E-02	G K
		795.76	5.121E-03	%	8.019E-02	2.26E-02	G
		569.29	1.421E-01	%	3.209E-01	9.68E-02	G
		801.84	-5.955E-02	&	6.438E-01	1.80E-01	G
CS-137	6.4283E-02						
		661.62	6.428E-02	(	6.623E-02	2.17E-02	G
CE-139	1.0764E-02						
		165.85	1.076E-02	%(P	6.704E-02	2.00E-02	G
EU-152	4.6074E-02						
		121.78	4.607E-02	%(	1.649E-01	4.95E-02	G K
		344.30	2.356E-02	%	1.672E-01	4.88E-02	G
		1408.08	7.422E-02	%	2.576E-01	7.36E-02	G
		964.00	1.486E-01	%	5.769E-01	1.69E-01	G
		1112.07	1.130E-01	&	6.003E-01	1.72E-01	G
		778.90	-4.853E-03	&	3.639E-01	9.83E-02	G
EU-154	3.9921E-02						
		123.10	3.992E-02	%(	1.066E-01	3.21E-02	G K
		1274.80	-9.388E-02	%	2.967E-01	8.77E-02	G
		723.30	0.000E+00	%	4.904E-01	1.41E-01	G
		1004.80	8.222E-02	&	3.325E-01	9.56E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	5.4932E-02						
		86.45	5.493E-02	%(	1.730E-01	5.20E-02	G K
		105.31	2.241E-02	%	2.553E-01	7.60E-02	G
HG-203	2.2419E-02						
		279.17	2.242E-02	&(P	6.880E-02	2.04E-02	G K
		72.87	-4.411E-01	&	1.840E+00	5.53E-01	G
		70.83	-1.690E-01	&	3.314E+00	9.88E-01	G
		82.50	-1.242E+00	%	3.794E+00	1.14E+00	G
TL-208	3.0133E-01						
		583.14	3.013E-01	@(	6.995E-02	3.28E-02	G
		510.72	5.872E-01	+	2.248E-01	9.64E-02	G
PB-212	7.1873E-01						
		238.63	7.187E-01	(	1.320E-01	5.09E-02	G K
							Energy duplication
		77.11	9.188E-01	+	4.274E-01	1.39E-01	G
		74.81	9.970E-01	&	8.711E-01	2.71E-01	G
PB-214	7.0965E-01						
		351.99	6.704E-01	(	1.124E-01	5.20E-02	G K
		295.22	7.855E-01	(	2.222E-01	8.55E-02	G
							Energy duplication
		77.11	1.503E+00	+	6.990E-01	2.27E-01	G
		241.92	-1.016E-01	%	1.048E+00	3.12E-01	G
BI-212	8.2778E-01						
		727.17	6.814E-01	(	5.179E-01	2.10E-01	G K
		1620.56	1.456E+00	(	1.130E+00	5.13E-01	G
		785.42	1.783E+00	%	2.408E+00	7.74E-01	G
BI-214	7.6180E-01						
		609.32	7.184E-01	@(	1.324E-01	7.10E-02	G K
		1764.51	1.077E+00	+	1.890E-01	1.66E-01	G
		1120.28	8.948E-01	(	6.083E-01	2.52E-01	G
RA-224	1.5410E+00						
		241.00	1.541E+00	(	1.519E+00	4.75E-01	G
RA-226	1.5598E+00						
		185.99	1.560E+00	(	1.519E+00	4.75E-01	G
AC-228	9.2269E-01						
		911.07	8.979E-01	(	1.878E-01	1.06E-01	G K
		968.90	1.240E+00	+	3.889E-01	1.92E-01	G
		338.40	9.825E-01	(	4.086E-01	1.61E-01	G

Yankee Chemistry Spectrum name: 101F22DEC2004_1750.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-2.8597E-01						
		236.00	-2.860E-01	&(	5.931E-01	1.80E-01	G K
		256.25	-1.375E-03	%	6.621E-01	1.93E-01	G
PA-234	-2.8227E-02						
		98.44	-2.823E-02	%(	2.177E-01	6.49E-02	G K
		946.00	7.881E-02	%	3.283E-01	9.50E-02	G
		131.28	1.529E-03	&	2.573E-01	7.61E-02	G
		94.67	-1.281E-02	%	3.939E-01	1.17E-01	G
		883.24	1.715E-01	%	4.395E-01	1.31E-01	G
		926.70	1.519E-01	%	6.041E-01	1.75E-01	G
		569.26	2.076E-01	%	4.690E-01	1.41E-01	G
TH-234	1.5120E+00						
		63.29	4.727E-01	%(	2.718E+00	8.13E-01	G K
		92.80	2.092E+00	(	1.984E+00	6.18E-01	G
		92.38	2.412E+00	&(	2.370E+00	7.36E-01	G
AM-241	-1.6817E-03						
		59.54	-1.682E-03	&(P	3.406E-01	1.01E-01	G

(- This peak used in the nuclide activity average.

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

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

Yankee Chemistry Spectrum name: 101F22DEC2004_1750.An1

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	3.0800E-02	3.8029E-02	5.0163E-01	5.0164E-01	4.746E-01
K-40		1.7062E+01	1.7062E+01	2.2436E+00	2.4420E+00	
MN-54	#A	3.6237E-02	3.7567E-02	5.1617E-02	5.1661E-02	5.220E-02
CO-57	#B	1.6403E-02	1.7102E-02	5.0764E-02	5.0773E-02	5.410E-02
CO-60	#B	-1.5599E-03	-1.5691E-03	6.4347E-02	6.4347E-02	7.498E-02
Sr-85	#A	-3.2216E-02	-3.8325E-02	7.9756E-02	7.9785E-02	7.402E-02
Kr-85	#A	-7.4373E+02	-7.4381E+02	1.5479E+03	1.5485E+03	1.709E+03
Y-88	#B	1.3709E-03	1.5237E-03	3.9065E-02	3.9065E-02	4.997E-02
NB-94	#B	-8.4021E-03	-8.4021E-03	5.6042E-02	5.6044E-02	6.584E-02
Ag-108M	#B	-2.1775E-03	-2.1780E-03	1.0124E-01	1.0124E-01	1.165E-01
CD-109	#A	2.0562E-01	2.1080E-01	1.6329E+00	1.6329E+00	1.778E+00
SN-113	#B	5.2571E-03	5.7974E-03	6.2324E-02	6.2325E-02	6.595E-02
SB-125	#B	1.1992E-01	1.2126E-01	1.0742E-01	1.0763E-01	1.714E-01
I-131	#B	0.0000E+00	0.0000E+00	1.9272E-01	1.9272E-01	5.538E-02
CS-134	#B	-1.4826E-02	-1.5050E-02	6.8847E-02	6.8852E-02	7.710E-02
CS-137	#A	6.4217E-02	6.4283E-02	6.5024E-02	6.5125E-02	6.617E-02
CE-139	#A	9.9180E-03	1.0764E-02	5.9874E-02	5.9877E-02	6.177E-02
EU-152	#B	4.5962E-02	4.6074E-02	1.4836E-01	1.4838E-01	1.645E-01
EU-154	#B	3.9777E-02	3.9921E-02	9.6400E-02	9.6426E-02	1.063E-01
EU-155	#B	5.4592E-02	5.4932E-02	1.5609E-01	1.5612E-01	1.719E-01
HG-203	#B	1.7606E-02	2.2419E-02	6.1191E-02	6.1204E-02	5.403E-02
TL-208	#	3.0133E-01	3.0133E-01	9.8533E-02	9.9993E-02	
PB-212	#	7.1873E-01	7.1873E-01	1.5273E-01	1.5804E-01	1.320E-01
PB-214	#	7.0965E-01	7.0965E-01	1.4228E-01	1.4782E-01	1.124E-01
BI-212		8.2778E-01	8.2778E-01	5.8115E-01	5.8303E-01	
BI-214		7.6180E-01	7.6180E-01	2.2594E-01	2.3000E-01	
RA-224	#	1.5410E+00	1.5410E+00	1.4256E+00	1.4282E+00	1.519E+00
RA-226	#	1.5598E+00	1.5598E+00	1.4261E+00	1.4288E+00	1.519E+00
AC-228		9.2269E-01	9.2269E-01	2.8017E-01	2.8497E-01	
TH-227	#B	-2.8597E-01	-2.8597E-01	5.3969E-01	5.3994E-01	5.931E-01
PA-234	#B	-2.8227E-02	-2.8227E-02	1.9458E-01	1.9458E-01	2.177E-01
TH-234	#B	1.5120E+00	1.5120E+00	1.3394E+00	1.3420E+00	2.718E+00
AM-241	#A	-1.6816E-03	-1.6817E-03	9.1267E-01	9.1267E-01	3.405E-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

Yankee Chemistry Spectrum name: 101F22DEC2004_1750.An1

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

Total Activity (269.6 to 1999.1 keV) 1.9875965E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 1.9875965E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_3JAN2005_1720.An1

Sample description
FSS-OOL-04-01-013-F SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_3JAN2005_1720.An1

Acquisition information

Start time:	03-Jan-2005 17:10:03
Live time:	2000
Real time:	2003
Dead time:	0.14 %
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:	1.5090E+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%
```

Yankee Chemistry Spectrum name: 101F_3JAN2005_1720.An1

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	03-Dec-2004 07:55:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 18 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2501

***** 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	216.	14.27	1.00	1.651E-02				
74.75	216.	14.27	1.00	1.651E-02	74.81	9.600	1.218E+00	PB212
77.01	354.	8.93	1.01	1.717E-02	77.11	10.700	1.722E+00	PB214
					77.11	17.500	1.053E+00	PB212
86.96	132.	31.94	1.50	1.910E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	1.693E+00	CD109
185.79	98.	25.92	1.86	1.859E-02				
185.79	98.	25.92	1.86	1.859E-02	185.99	3.280	1.443E+00	RA226
209.70	106.	26.74	0.81	1.719E-02				
238.63	567.	4.99	1.12	1.558E-02				
238.63	567.	4.99	1.12	1.558E-02	238.63	43.100	7.565E-01	PB212
241.59	113.	18.18	1.12	1.542E-02	241.00	3.900	1.685E+00	RA224
					241.92	7.470	8.823E-01	PB214
270.00	57.	29.82	1.43	1.401E-02				
277.56	45.	35.76	1.00	1.367E-02				
294.91	201.	12.92	1.25	1.293E-02	295.22	19.200	7.253E-01	PB214
329.34	64.	31.80	0.78	1.165E-02				
338.44	142.	14.03	1.12	1.135E-02	338.40	12.010	9.329E-01	AC228
351.82	316.	7.97	1.25	1.093E-02	351.99	37.100	6.973E-01	PB214
510.19	77.	21.04	0.78	7.598E-03	510.72	22.500	4.017E-01	TL208
582.97	176.	10.89	1.14	6.686E-03	583.14	86.000	2.750E-01	TL208
609.02	265.	7.37	1.23	6.416E-03	609.32	46.090	8.017E-01	BI214
726.92	58.	26.80	1.58	5.445E-03	727.17	11.800	8.059E-01	BI212
794.62	36.	29.59	1.40	5.023E-03				
794.62	36.	29.59	1.40	5.023E-03	795.76	85.400	7.768E-02	CS134
910.89	105.	18.11	1.76	4.447E-03	911.07	29.000	7.278E-01	AC228

968.64	86.	19.70	0.86	4.213E-03	968.90	17.460	1.052E+00	AC228
1110.85	21.	39.07	1.71	3.735E-03	1112.07	13.580	PBC<MDA	EU152
1119.76	81.	19.48	1.05	3.712E-03	1120.28	15.040	1.300E+00	BI214
1460.14	619.	4.08	1.83	2.944E-03	1460.75	10.700	1.761E+01	K40
1763.59	34.	18.05	1.18	2.481E-03	1764.51	15.920	7.798E-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
148.88	74.72	372.	211.	0.105	44.04	1.005	BI-207 D
419.08	209.70	279.	106.	0.053	80.22	0.813	NP-239 sM
476.95	238.58	117.	567.	0.284	14.97	1.121	PB-212 D
539.72	270.00	116.	57.	0.029	89.47	1.430	AC-228 s
554.86	277.56	89.	63.	0.031	74.36	1.002	NP-239
658.46	329.34	128.	64.	0.032	95.40	0.776	TH-227 s
1589.46	794.62	29.	36.	0.018	80.53	1.398	AC-228 s

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

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.28	74.85	926.	176.	0.088	76.68	1.499s
PB-214	153.79	77.11	324.	353.	0.176	26.90	1.006D
PB-212	153.79	77.11	787.	282.	0.141	45.84	1.499D
EU-155	173.50	86.96	822.	132.	0.066	95.81	1.499
RA-226	371.22	185.78	412.	85.	0.043	105.99	1.499s
PB-212	476.84	238.57	348.	411.	0.206	24.26	1.499
RA-224	481.20	240.75	-693.	283.	0.141	1.06	1.499
PB-214	483.54	241.92	127.	120.	0.060	48.46	1.124D
PB-214	589.56	294.91	175.	201.	0.100	38.76	1.249s
AC-228	676.67	338.44	102.	142.	0.071	42.09	1.123s
PB-214	703.44	351.82	113.	316.	0.158	23.92	1.252
TL-208	1020.32	510.19	70.	77.	0.038	63.11	0.782s
TL-208	1165.94	582.97	66.	176.	0.088	32.67	1.142
BI-214	1218.07	609.02	41.	265.	0.132	22.12	1.233
BI-212	1454.00	726.92	55.	58.	0.029	80.40	1.576s
AC-228	1822.13	910.89	67.	105.	0.052	54.33	1.761
AC-228	1937.69	968.64	50.	86.	0.043	59.11	0.861s
EU-152	2222.28	1110.85	24.	21.	0.011	117.22	1.708
BI-214	2240.12	1119.76	42.	81.	0.041	58.44	1.051s
K-40	2921.29	1460.14	4.	619.	0.310	12.23	1.833
BI-214	3528.61	1763.59	2.	34.	0.017	54.15	1.177s

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		2.7925E-01						
			477.56	2.792E-01	%(	7.391E-01	2.21E-01	G
K-40		1.7612E+01						
			1460.75	1.761E+01	(	3.355E-01	7.18E-01	G
MN-54		8.4745E-04						
			834.81	8.475E-04	&(	7.141E-02	2.01E-02	G
CO-57		-7.0772E-04						
			122.07	-7.077E-04	%(P	6.041E-02	1.79E-02	G K
			136.43	1.378E-02	&	5.025E-01	1.49E-01	G
CO-60		1.7508E-03						
			1332.51	1.751E-03	%(P	7.081E-02	1.79E-02	G K
			1173.23	-1.437E-02	% P	7.870E-02	1.98E-02	G K
Sr-85		-3.5388E-02						
			514.00	-3.539E-02	%(	9.192E-02	2.76E-02	G
Kr-85		-5.8423E+02						
			513.99	-5.842E+02	%(	1.517E+03	4.56E+02	G
Y-88		-1.1401E-03						
			1836.01	-1.140E-03	&(P	7.750E-02	1.94E-02	G K
			898.02	-2.075E-03	& P	1.034E-01	2.91E-02	G
NB-94		-1.7610E-02						
			871.10	-1.761E-02	%(	6.907E-02	2.02E-02	G K
			702.50	-2.461E-03	%	6.098E-02	1.73E-02	G K
Ag-108M		-1.7793E-02						
			722.95	-1.779E-02	%(	7.468E-02	2.19E-02	G K
			614.37	1.739E-02	%	5.174E-02	1.53E-02	G
			433.93	1.224E-02	&	4.943E-02	1.46E-02	G
CD-109		4.1927E-02						
			88.04	4.193E-02	%(	1.587E+00	4.72E-01	G
SN-113		-2.5962E-02						
			391.71	-2.596E-02	%(P	9.565E-02	2.82E-02	G K
			255.04	4.733E-01	&	2.602E+00	7.71E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.1927E-02						
		427.95	1.193E-02	%(	1.497E-01	4.31E-02	G K
		600.77	-2.712E-02	&	2.733E-01	7.80E-02	G
		636.15	-1.230E-01	%	5.281E-01	1.55E-01	G
		463.51	3.255E-01	&	4.797E-01	1.49E-01	G
		176.29	-1.101E-01	&	7.526E-01	2.24E-01	G
I-131	1.5637E-01						
		364.48	1.564E-01	&(	7.141E-01	2.10E-01	G K
		636.97	-2.429E+00	%	1.145E+01	3.34E+00	G
		284.29	-2.948E+00	%	1.113E+01	3.32E+00	G
CS-134	-4.7532E-04						
		604.66	-4.753E-04	%(	8.043E-02	2.32E-02	G K
		795.76	0.000E+00	%	6.286E-02	1.73E-02	G
		569.29	1.427E-01	%	3.346E-01	1.01E-01	G
		801.84	1.794E-01	&	6.888E-01	2.01E-01	G
CS-137	0.0000E+00						
		661.62	0.000E+00	%(	7.293E-02	2.07E-02	G
CE-139	7.7070E-03						
		165.85	7.707E-03	%(P	4.552E-02	1.35E-02	G
EU-152	1.0830E-01						
		121.78	-1.733E-02	&(	1.724E-01	5.14E-02	G K
		344.30	-3.609E-03	%	1.302E-01	3.72E-02	G
		1408.08	1.183E-01	%	2.072E-01	6.55E-02	G
		964.00	6.915E-03	%	5.181E-01	1.46E-01	G
		1112.07	3.788E-01	(	4.542E-01	1.48E-01	G
		778.90	4.647E-02	%	3.695E-01	1.04E-01	G
EU-154	0.0000E+00						
		123.10	0.000E+00	%(	1.150E-01	3.40E-02	G K
		1274.80	-1.103E-02	&	2.454E-01	6.88E-02	G
		723.30	-7.876E-02	%	3.496E-01	1.02E-01	G
		1004.80	3.009E-02	%	3.267E-01	9.09E-02	G
EU-155	1.9133E-01						
		86.45	1.913E-01	(	1.976E-01	6.11E-02	G K
		105.31	8.918E-02	%	2.261E-01	6.83E-02	G
HG-203	-3.4696E-02						
		279.17	-3.470E-02	%(P	9.530E-02	2.82E-02	G K
		72.87	-8.397E-01	&	2.323E+00	7.02E-01	G
		70.83	-2.582E-02	&	3.307E+00	9.82E-01	G
		82.50	-7.876E-01	%	4.795E+00	1.44E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.7495E-01						
		583.14	2.750E-01	(	6.342E-02	2.99E-02	G
		510.72	4.017E-01	+	2.192E-01	8.44E-02	G
PB-212	5.4885E-01						
		238.63	5.488E-01	(	1.195E-01	4.44E-02	G K
							Energy duplication
		77.11	8.387E-01	+	3.970E-01	1.28E-01	G
		74.81	9.936E-01	&	8.150E-01	2.54E-01	G
PB-214	7.0685E-01						
		351.99	6.973E-01	(	1.156E-01	5.56E-02	G K
		295.22	7.253E-01	@(	2.324E-01	9.37E-02	G
							Energy duplication
		77.11	1.716E+00	+	4.214E-01	1.54E-01	G
		241.92	9.322E-01	+	4.303E-01	1.51E-01	G
BI-212	8.0592E-01						
		727.17	8.059E-01	*(	5.205E-01	2.16E-01	G K
		1620.56	-6.929E-02	&	2.192E+00	5.73E-01	G
		785.42	2.865E-01	%	2.548E+00	7.18E-01	G
BI-214	7.9610E-01						
		609.32	8.017E-01	(	9.906E-02	5.91E-02	G K
		1764.51	7.798E-01	(	1.951E-01	1.41E-01	G
		1120.28	1.300E+00	+	5.281E-01	2.53E-01	G
RA-224	4.2005E+00						
		241.00	4.200E+00	(	1.095E-01	1.49E-02	G
RA-226	1.2543E+00						
		185.99	1.254E+00	*(	1.430E+00	4.43E-01	G
AC-228	8.6677E-01						
		911.07	7.278E-01	(	2.841E-01	1.32E-01	G K
		968.90	1.052E+00	(	4.326E-01	2.07E-01	G
		338.40	9.329E-01	*(	3.270E-01	1.31E-01	G
TH-227	-2.7373E-02						
		236.00	-2.737E-02	%(	5.109E-01	1.51E-01	G K
		256.25	9.555E-03	&	6.625E-01	1.94E-01	G
PA-234	-1.0356E-02						
		98.44	-1.036E-02	%(	2.165E-01	6.44E-02	G K
		946.00	-1.477E-02	%	3.402E-01	9.55E-02	G
		131.28	2.192E-02	%	2.516E-01	7.49E-02	G
		94.67	-3.063E-03	%	3.646E-01	1.08E-01	G
		883.24	-2.088E-03	%	4.804E-01	1.33E-01	G
		926.70	1.441E-01	%	5.985E-01	1.74E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		569.26	2.056E-01	%	4.823E-01	1.45E-01	G
TH-234	1.2231E+00						
		63.29	1.223E+00	%(	2.571E+00	7.80E-01	G K
		92.80	1.307E+00	%	1.969E+00	6.02E-01	G
		92.38	1.501E+00	&	2.340E+00	7.14E-01	G
AM-241	-6.1764E-02						
		59.54	-6.176E-02	%(P	3.571E-01	1.07E-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	1.8581E-01	2.7925E-01	6.6435E-01	6.6453E-01	4.918E-01
K-40		1.7612E+01	1.7612E+01	2.1544E+00	2.3731E+00	
MN-54	#A	7.9041E-04	8.4745E-04	6.0213E-02	6.0213E-02	6.661E-02
CO-57	#B	-6.5294E-04	-7.0772E-04	1.4153E-01	1.4153E-01	5.573E-02
CO-60	#B	1.7312E-03	1.7508E-03	5.3640E-02	5.3640E-02	7.002E-02

Sr-85	#A	-2.5302E-02	-3.5388E-02	8.2839E-02	8.2863E-02	6.572E-02
Kr-85	#A	-5.8410E+02	-5.8423E+02	1.3676E+03	1.3680E+03	1.517E+03
Y-88	#B	-9.2964E-04	-1.1401E-03	2.8785E-02	2.8785E-02	6.319E-02
NB-94	#B	-1.7610E-02	-1.7610E-02	6.0691E-02	6.0699E-02	6.907E-02
Ag-108M	#B	-1.7785E-02	-1.7793E-02	6.5770E-02	6.5778E-02	7.465E-02
CD-109	#A	3.9962E-02	4.1927E-02	1.4149E+00	1.4149E+00	1.513E+00
SN-113	#B	-2.1491E-02	-2.5962E-02	9.9245E-02	9.9256E-02	7.918E-02
SB-125	#B	1.1674E-02	1.1927E-02	1.2929E-01	1.2930E-01	1.465E-01
I-131	#B	1.0448E-02	1.5637E-01	6.2934E-01	6.2940E-01	4.772E-02
CS-134	#B	-4.6178E-04	-4.7532E-04	6.9665E-02	6.9665E-02	7.814E-02
CS-137	#A	0.0000E+00	0.0000E+00	6.1990E-02	6.1990E-02	7.278E-02
CE-139	#A	6.5792E-03	7.7070E-03	4.0370E-02	4.0373E-02	3.886E-02
EU-152	#B	1.0779E-01	1.0830E-01	1.2695E-01	1.2709E-01	1.716E-01
EU-154	#B	0.0000E+00	0.0000E+00	1.0211E-01	1.0211E-01	1.142E-01
EU-155	#A	1.8905E-01	1.9133E-01	1.8331E-01	1.8361E-01	1.953E-01
HG-203	#B	-2.1751E-02	-3.4696E-02	1.2417E-01	1.2418E-01	5.974E-02
TL-208		2.7495E-01	2.7495E-01	8.9816E-02	9.1150E-02	
PB-212	#	5.4885E-01	5.4885E-01	1.3313E-01	1.3669E-01	1.195E-01
PB-214		7.0685E-01	7.0685E-01	1.6097E-01	1.6585E-01	
BI-212	#	8.0592E-01	8.0592E-01	6.4797E-01	6.4957E-01	
BI-214		7.9610E-01	7.9610E-01	1.7607E-01	1.8173E-01	
RA-224		4.2005E+00	4.2005E+00	4.4590E-02	2.4149E-01	1.095E-01
RA-226	#A	1.2543E+00	1.2543E+00	1.3294E+00	1.3313E+00	1.430E+00
AC-228		8.6677E-01	8.6677E-01	2.6190E-01	2.6644E-01	
TH-227	#B	-2.7373E-02	-2.7373E-02	4.5394E-01	4.5394E-01	5.109E-01
PA-234	#B	-1.0356E-02	-1.0356E-02	1.9323E-01	1.9323E-01	2.165E-01
TH-234	#B	1.2231E+00	1.2231E+00	2.3388E+00	2.3398E+00	2.571E+00
AM-241	#A	-6.1755E-02	-6.1764E-02	3.2827E-01	3.2829E-01	3.571E-01

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

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

Total Activity (269.6 to 1999.1 keV) 2.5263350E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 2.5263350E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_3JAN2005_1755.An1

Sample description
FSS-OOL-04-01-004-F SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_3JAN2005_1755.An1

Acquisition information
Start time: 03-Jan-2005 17:47:48
Live time: 2000
Real time: 2003
Dead time: 0.14 %
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: 1.0640E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.0640E+03) =
9.3985E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_3JAN2005_1755.An1

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	03-Dec-2004 10:35:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 20 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1958

***** 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
74.74	256.	11.04	1.00	1.651E-02	74.81	9.600	2.046E+00	PB212
77.00	320.	8.91	1.01	1.717E-02	77.11	17.500	1.352E+00	PB212
					77.11	10.700	2.211E+00	PB214
92.82	91.	39.16	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.940E+00	TH234
92.86	91.	39.59	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.947E+00	TH234
185.66	142.	21.26	1.43	1.860E-02	185.99	3.280	2.959E+00	RA226
238.62	629.	4.56	1.12	1.558E-02	238.63	43.100	1.191E+00	PB212
241.60	119.	17.56	1.12	1.542E-02	241.00	3.900	2.499E+00	RA224
					241.92	7.470	1.309E+00	PB214
269.88	66.	26.93	1.54	1.402E-02				
295.13	157.	12.49	0.97	1.292E-02	295.22	19.200	8.028E-01	PB214
300.23	45.	37.13	1.11	1.272E-02				
338.20	181.	13.34	1.22	1.136E-02	338.40	12.010	1.687E+00	AC228
351.88	268.	9.30	1.12	1.093E-02	351.99	37.100	8.386E-01	PB214
462.97	39.	26.86	1.50	8.342E-03	463.51	10.000	6.013E-01	SB125
510.57	122.	15.56	1.37	7.593E-03	510.72	22.500	9.088E-01	TL208
582.91	194.	9.38	1.62	6.687E-03	583.14	86.000	4.284E-01	TL208
609.11	188.	9.39	1.51	6.415E-03	609.32	46.090	8.083E-01	BI214
661.41	149.	11.37	1.51	5.939E-03	661.62	84.620	3.764E-01	CS137
726.98	34.	27.60	1.50	5.443E-03	727.17	11.800	6.777E-01	BI212
794.83	25.	30.17	1.50	5.016E-03	795.76	85.400	7.666E-02	CS134
910.53	110.	16.04	1.80	4.449E-03	911.07	29.000	1.087E+00	AC228
968.10	110.	14.65	1.67	4.215E-03	968.90	17.460	1.900E+00	AC228
1119.34	66.	18.19	0.79	3.714E-03	1120.28	15.040	1.497E+00	BI214

1460.18	388.	5.28	1.89	2.943E-03	1460.75	10.700	1.564E+01	K40

Yankee Chemistry Spectrum name: 101F_3JAN2005_1755.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1763.62	31.	17.96	1.25	2.481E-03	1764.51	15.920	9.967E-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	
539.48	269.88	110.	66.	0.033	80.78	1.539	AC-228	s
600.21	300.23	104.	45.	0.022	111.40	1.109	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-212	149.19	74.81	235.	256.	0.128	31.61	1.005D
PB-212	153.79	77.11	248.	292.	0.146	2.29	1.006A
PB-214	153.79	77.11	393.	120.	0.060	7.58	1.499A
TH-234	185.31	92.86	610.	91.	0.046	118.76	1.499
TH-234	185.23	92.82	592.	91.	0.046	117.47	1.499
RA-226	371.12	185.73	296.	128.	0.064	68.75	1.407s
PB-212	476.96	238.63	102.	627.	0.313	13.80	1.121D
RA-224	481.70	241.00	318.	80.	0.040	105.02	1.123D
PB-214	483.54	241.92	174.	75.	0.037	70.11	1.124A
PB-214	590.01	295.13	103.	157.	0.078	37.48	0.975s
AC-228	676.19	338.20	122.	181.	0.091	40.01	1.217s
PB-214	703.55	351.88	113.	268.	0.134	27.90	1.116
SB-125	925.84	462.97	35.	39.	0.019	80.57	1.499s
TL-208	1021.08	510.57	75.	122.	0.061	46.68	1.367s
TL-208	1165.82	582.91	44.	194.	0.097	28.13	1.619
BI-214	1218.25	609.11	40.	188.	0.094	28.16	1.506s
CS-137	1322.90	661.41	41.	149.	0.074	34.10	1.506
BI-212	1454.12	726.98	28.	34.	0.017	82.80	1.499s
CS-134	1589.88	794.83	16.	25.	0.013	90.50	1.502s
AC-228	1821.41	910.53	50.	110.	0.055	48.13	1.803s
AC-228	1936.61	968.10	34.	110.	0.055	43.94	1.668s
BI-214	2239.26	1119.34	24.	66.	0.033	54.57	0.793s
K-40	2921.37	1460.18	8.	388.	0.194	15.85	1.886
BI-214	3528.68	1763.62	0.	31.	0.015	53.88	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	MDA Value pCi/gm	COMMENTS
BE-7		-2.9365E-02					
			477.56	-2.936E-02	&(	9.623E-01 2.74E-01	G
K-40		1.5636E+01					
			1460.75	1.564E+01	(	6.541E-01 8.26E-01	G
MN-54		-2.1162E-02					
			834.81	-2.116E-02	%(	8.027E-02 2.34E-02	G
CO-57		6.2749E-03					
			122.07	6.275E-03	&(P	6.834E-02 2.02E-02	G K
			136.43	-3.892E-02	&	6.067E-01 1.80E-01	G
CO-60		1.4238E-02					
			1332.51	1.424E-02	%(P	9.048E-02 2.31E-02	G K
			1173.23	5.940E-03	% P	1.110E-01 2.96E-02	G K
Sr-85		-2.9562E-02					
			514.00	-2.956E-02	%(	1.249E-01 3.69E-02	G
Kr-85		-4.8893E+02					
			513.99	-4.889E+02	%(	2.064E+03 6.10E+02	G
Y-88		-1.6160E-03					
			1836.01	-1.616E-03	%(P	4.828E-02 6.55E-03	G K
			898.02	8.673E-03	% P	1.007E-01 2.79E-02	G
NB-94		8.2219E-03					
			871.10	8.222E-03	&(	7.233E-02 2.03E-02	G K
			702.50	0.000E+00	%	9.305E-02 2.64E-02	G K
Ag-108M		-3.3883E-02					
			722.95	-3.388E-02	%(	1.081E-01 3.21E-02	G K
			614.37	-2.039E-02	%	7.174E-02 2.11E-02	G
			433.93	-8.003E-03	&	6.913E-02 2.00E-02	G
CD-109		-4.4240E-01					
			88.04	-4.424E-01	%(	2.455E+00 7.36E-01	G
SN-113		-2.2225E-03					
			391.71	-2.223E-03	&(P	1.059E-01 2.99E-02	G K
			255.04	3.583E-02	&	2.672E+00 7.71E-01	G

Yankee Chemistry Spectrum name: 101F_3JAN2005_1755.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.5185E-01						
		427.95	0.000E+00	%(	2.384E-01	6.84E-02	G K
		600.77	-4.695E-02	&	3.568E-01	1.02E-01	G
		636.15	-2.467E-02	%	5.051E-01	1.39E-01	G
		463.51	6.013E-01	(	4.683E-01	1.61E-01	G
		176.29	-8.474E-02	%	8.765E-01	2.59E-01	G
I-131	-2.3577E-02						
		364.48	-2.358E-02	%(	9.180E-01	2.61E-01	G K
		636.97	2.217E+00	&	1.061E+01	3.03E+00	G
		284.29	-3.032E+00	%	1.406E+01	4.16E+00	G
CS-134	4.7204E-02						
		604.66	2.143E-02	&(	5.491E-02	1.64E-02	G K
		795.76	7.666E-02	*(	6.542E-02	2.31E-02	G
		569.29	1.284E-01	%	3.712E-01	1.10E-01	G
		801.84	6.351E-02	%	6.716E-01	1.84E-01	G
CS-137	3.7638E-01						
		661.62	3.764E-01	(	8.281E-02	4.28E-02	G
CE-139	-1.3201E-04						
		165.85	-1.320E-04	%(P	8.769E-02	2.58E-02	G
EU-152	2.4162E-03						
		121.78	2.416E-03	&(	1.919E-01	5.66E-02	G K
		344.30	6.262E-03	&	1.969E-01	5.65E-02	G
		1408.08	1.840E-01	%	2.612E-01	8.72E-02	G
		964.00	7.028E-04	%	7.053E-01	1.97E-01	G
		1112.07	-5.867E-02	%	5.578E-01	1.53E-01	G
		778.90	-5.060E-02	&	4.965E-01	1.38E-01	G
EU-154	2.6838E-02						
		123.10	2.684E-02	%(	1.468E-01	4.38E-02	G K
		1274.80	1.344E-02	%	2.903E-01	8.01E-02	G
		723.30	-1.600E-01	%	5.147E-01	1.53E-01	G
		1004.80	-1.480E-01	%	5.779E-01	1.69E-01	G
EU-155	1.7100E-01						
		86.45	1.710E-01	%(	2.519E-01	7.71E-02	G K
		105.31	1.374E-01	%	2.850E-01	8.64E-02	G
HG-203	4.1377E-02						
		279.17	4.138E-02	&(P	1.014E-01	3.02E-02	G K
		72.87	-1.306E+00	&	2.965E+00	8.98E-01	G
		70.83	1.834E+00	%	4.599E+00	1.39E+00	G
		82.50	1.044E-01	%	6.325E+00	1.88E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	4.2839E-01						
		583.14	4.284E-01	(	7.436E-02	4.02E-02	G
		510.72	9.088E-01	+	3.199E-01	1.41E-01	G
PB-212	1.2335E+00						
		238.63	1.186E+00	(	9.428E-02	5.45E-02	G K
							Energy duplication
		77.11	1.233E+00	}	3.208E-01	9.42E-03	G
		74.81	2.045E+00	+	5.931E-01	2.15E-01	G
PB-214	8.2776E-01						
		351.99	8.386E-01	(	1.640E-01	7.79E-02	G K
		295.22	8.028E-01	@(	2.562E-01	1.00E-01	G
							Energy duplication
		77.11	8.278E-01	}	6.558E-01	2.09E-02	G
		241.92	8.278E-01	}	7.087E-01	1.93E-01	G
BI-212	6.7773E-01						
		727.17	6.777E-01	(	5.377E-01	1.87E-01	G K
		1620.56	4.850E-01	%	2.474E+00	6.74E-01	G
		785.42	1.946E+00	%	3.298E+00	1.02E+00	G
BI-214	8.5666E-01						
		609.32	8.083E-01	@(	1.381E-01	7.59E-02	G K
		1764.51	9.967E-01	(	2.370E-01	1.79E-01	G
		1120.28	1.497E+00	+	5.833E-01	2.72E-01	G
RA-224	1.6799E+00						
							Derived Ave Activity
		241.00	1.680E+00	}(	1.809E+00	5.99E-01	G
RA-226	2.6777E+00						
		185.99	2.678E+00	(	1.726E+00	6.14E-01	G
AC-228	1.0874E+00						
		911.07	1.087E+00	@(	3.499E-01	1.74E-01	G K
		968.90	1.900E+00	+	5.161E-01	2.78E-01	G
		338.40	1.687E+00	+	5.046E-01	2.25E-01	G
TH-227	-1.7812E-01						
		236.00	-1.781E-01	%(	7.489E-01	2.24E-01	G K
		256.25	-5.025E-04	%	7.650E-01	2.22E-01	G
PA-234	-2.1740E-02						
		98.44	-2.174E-02	%(	2.563E-01	7.61E-02	G K
		946.00	3.381E-02	&	4.029E-01	1.12E-01	G
		131.28	1.416E-02	%	3.101E-01	9.19E-02	G
		94.67	-1.717E-01	&	4.864E-01	1.47E-01	G
		883.24	3.485E-02	&	5.425E-01	1.48E-01	G

Yankee Chemistry Spectrum name: 101F_3JAN2005_1755.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		926.70	-5.078E-02	%	6.669E-01	1.84E-01	G
		569.26	1.851E-01	%	5.351E-01	1.58E-01	G
TH-234	1.8491E+00						
		63.29	1.497E+00	%(	3.158E+00	9.57E-01	G K
		92.80	1.940E+00	(	2.470E+00	7.60E-01	G
		92.38	2.278E+00	(	2.933E+00	9.02E-01	G
AM-241	-9.7509E-02						
		59.54	-9.751E-02	&(P	4.731E-01	1.42E-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	-1.9560E-02	-2.9365E-02	8.2341E-01	8.2341E-01	6.410E-01
K-40		1.5636E+01	1.5636E+01	2.4787E+00	2.6315E+00	
MN-54	#A	-1.9742E-02	-2.1162E-02	7.0053E-02	7.0063E-02	7.488E-02
CO-57	#B	5.7904E-03	6.2749E-03	6.0641E-02	6.0642E-02	6.306E-02

CO-60	#B	1.4079E-02	1.4238E-02	6.9418E-02	6.9423E-02	8.947E-02
Sr-85	#A	-2.1155E-02	-2.9562E-02	1.1078E-01	1.1079E-01	8.940E-02
Kr-85	#A	-4.8882E+02	-4.8893E+02	1.8307E+03	1.8309E+03	2.064E+03
Y-88	#B	-1.3184E-03	-1.6160E-03	9.6962E-03	9.6966E-03	3.939E-02
NB-94	#B	8.2218E-03	8.2219E-03	6.0771E-02	6.0773E-02	7.233E-02
Ag-108M	#B	-3.3868E-02	-3.3883E-02	9.6246E-02	9.6265E-02	1.081E-01
CD-109	#A	-4.2172E-01	-4.4240E-01	2.2066E+00	2.2067E+00	2.340E+00
SN-113	#B	-1.8407E-03	-2.2225E-03	6.6670E-01	6.6670E-01	8.770E-02
SB-125	#B	1.4863E-01	1.5185E-01	1.2234E-01	1.2264E-01	2.333E-01
I-131	#B	-1.5869E-03	-2.3577E-02	7.8450E-01	7.8450E-01	6.179E-02
CS-134	#B	4.5864E-02	4.7204E-02	4.2719E-02	4.2802E-02	5.335E-02
CS-137		3.7564E-01	3.7638E-01	1.2833E-01	1.3008E-01	
CE-139	#A	-1.1274E-04	-1.3201E-04	2.1699E-02	2.1699E-02	7.489E-02
EU-152	#B	2.4050E-03	2.4162E-03	1.6980E-01	1.6980E-01	1.911E-01
EU-154	#B	2.6651E-02	2.6838E-02	1.3139E-01	1.3140E-01	1.458E-01
EU-155	#B	1.6896E-01	1.7100E-01	2.3119E-01	2.3138E-01	2.489E-01
HG-203	#B	2.5973E-02	4.1377E-02	9.0723E-02	9.0753E-02	6.362E-02
TL-208		4.2839E-01	4.2839E-01	1.2051E-01	1.2292E-01	
PB-212		1.2335E+00	1.2335E+00	1.7025E-01	1.8396E-01	
PB-214		8.2776E-01	8.2776E-01	2.3091E-01	2.3560E-01	
BI-212	#	6.7773E-01	6.7773E-01	5.6117E-01	5.6247E-01	5.377E-01
BI-214		8.5666E-01	8.5666E-01	2.4125E-01	2.4606E-01	
RA-224	A	1.6799E+00	1.6799E+00	1.7643E+00	1.7668E+00	
RA-226		2.6776E+00	2.6777E+00	1.8410E+00	1.8472E+00	
AC-228	#	1.0874E+00	1.0874E+00	5.2340E-01	5.2699E-01	
TH-227	#B	-1.7812E-01	-1.7812E-01	6.7267E-01	6.7274E-01	7.489E-01
PA-234	#B	-2.1740E-02	-2.1740E-02	2.2832E-01	2.2832E-01	2.563E-01
TH-234	#B	1.8491E+00	1.8491E+00	1.5682E+00	1.5716E+00	3.158E+00
AM-241	#A	-9.7496E-02	-9.7509E-02	4.3404E-01	4.3408E-01	4.730E-01

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

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

Total Activity (269.6 to 1999.1 keV) 2.4802422E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 2.4803265E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_3JAN2005_1830.An1

Sample description
FSS-OOL-04-01-018-F SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_3JAN2005_1830.An1

Acquisition information

Start time:	03-Jan-2005 18:24:44
Live time:	2000
Real time:	2003
Dead time:	0.16 %
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:	1.5190E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.5190E+03) = 6.5833E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_3JAN2005_1830.An1

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	03-Dec-2004 14:28:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 20 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2631

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.98	264.	12.12	1.00	1.664E-02	74.81	9.600	1.477E+00	PB212
77.04	409.	8.94	1.01	1.723E-02	77.11	17.500	1.208E+00	PB212
					77.11	10.700	1.975E+00	PB214
84.07	62.	39.03	1.00	1.871E-02				
86.80	163.	18.18	1.01	1.914E-02	86.45	32.740	2.351E-01	EU155
					88.04	3.790	2.079E+00	CD109
89.95	140.	19.74	1.02	1.957E-02				
93.75	91.	33.76	1.02	1.999E-02	92.80	3.000	1.361E+00	TH234
129.04	137.	29.12	1.89	2.110E-02				
186.11	159.	22.78	1.12	1.858E-02	185.99	3.280	2.324E+00	RA226
209.20	102.	30.80	0.99	1.722E-02				
238.66	868.	3.91	1.12	1.557E-02				
238.66	868.	3.91	1.12	1.557E-02	238.63	43.100	1.150E+00	PB212
241.52	167.	14.24	1.12	1.542E-02	241.00	3.900	2.461E+00	RA224
					241.92	7.470	1.289E+00	PB214
270.13	84.	28.21	0.95	1.401E-02				
277.25	42.	38.54	1.15	1.369E-02				
295.27	267.	8.49	1.11	1.292E-02	295.22	19.200	9.586E-01	PB214
300.36	68.	23.49	1.29	1.271E-02				
338.27	200.	14.52	1.26	1.135E-02	338.40	12.010	1.306E+00	AC228
351.60	391.	7.31	1.27	1.094E-02				
351.60	391.	7.31	1.27	1.094E-02	351.99	37.100	8.576E-01	PB214
511.12	142.	14.25	1.51	7.585E-03	510.72	22.500	7.392E-01	TL208
582.86	262.	10.59	1.22	6.688E-03	583.14	86.000	4.055E-01	TL208
609.00	282.	8.45	1.15	6.416E-03	609.32	46.090	8.488E-01	BI214
661.25	118.	16.19	1.57	5.941E-03	661.62	84.620	2.086E-01	CS137

727.26	64.	20.31	1.90	5.442E-03	723.30	19.700	5.321E-01	EU154
					727.17	11.800	8.865E-01	BI212
768.13	48.	36.69	1.22	5.179E-03				
794.26	31.	35.14	0.73	5.025E-03				
910.98	160.	10.70	1.58	4.447E-03	911.07	29.000	1.105E+00	AC228
963.74	29.	35.75	1.61	4.231E-03	964.00	14.580	PBC<MDA	EU152
968.78	86.	18.73	1.44	4.213E-03	968.90	17.460	1.035E+00	AC228
1120.07	82.	19.68	1.64	3.711E-03	1120.28	15.040	1.310E+00	BI214
1460.25	591.	4.36	2.11	2.943E-03	1460.75	10.700	1.669E+01	K40
1763.47	38.	17.99	1.73	2.481E-03	1764.51	15.920	8.468E-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	
149.52	75.15	379.	264.	0.132	36.37	1.005	PB-214	D
153.65	77.22	462.	409.	0.204	26.81	1.006	PB-214	D
178.93	89.93	394.	101.	0.050	88.73	1.016	PB-214	D
257.69	129.04	570.	149.	0.075	72.27	1.889	AC-228	s
418.07	209.20	354.	102.	0.051	92.40	0.985	AC-228	s
477.03	238.62	143.	867.	0.434	11.75	1.122	PB-212	D
539.99	270.13	194.	84.	0.042	84.63	0.949	AC-228	
554.23	277.25	113.	42.	0.021	118.15	1.152	TL-208	
600.47	300.36	98.	68.	0.034	70.46	1.288	PB-212	
703.00	351.60	454.	83.	0.041	114.47	1.267	PB-214	s
1536.46	768.13	70.	48.	0.024	110.06	1.222	BI-214	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-212	149.31	74.87	1099.	217.	0.109	67.84	1.499
PB-212	153.79	77.11	990.	287.	0.143	49.78	1.499D
PB-214	153.79	77.11	990.	287.	0.143	49.78	1.499D
EU-155	173.68	87.05	998.	155.	0.078	89.54	1.499
CD-109	175.66	88.04	454.	80.	0.040	117.70	1.014D
TH-234	185.76	93.09	862.	155.	0.078	83.70	1.499s
RA-226	371.81	186.08	474.	143.	0.071	69.50	1.499s
PB-212	476.96	238.63	399.	650.	0.325	17.56	1.499D
RA-224	481.70	241.00	419.	139.	0.070	67.40	1.123D
PB-214	590.26	295.26	170.	232.	0.116	30.89	1.499
AC-228	676.33	338.27	208.	200.	0.100	43.57	1.262
PB-214	703.35	351.78	142.	326.	0.163	22.74	1.499s
TL-208	1022.18	511.12	86.	142.	0.071	42.75	1.513s
TL-208	1165.72	582.86	124.	262.	0.131	31.78	1.216
BI-214	1218.03	609.00	84.	282.	0.141	25.35	1.151
CS-137	1322.59	661.25	64.	118.	0.059	48.56	1.565
EU-154	1454.25	727.05	27.	63.	0.031	51.82	1.499s
BI-212	1454.67	727.26	42.	64.	0.032	60.94	1.897s

Yankee Chemistry Spectrum name: 101F_3JAN2005_1830.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1822.32	910.98	42.	160.	0.080	32.11	1.584s
EU-152	1927.89	963.74	40.	29.	0.015	107.24	1.612s
AC-228	1937.97	968.78	50.	86.	0.043	56.18	1.437
BI-214	2240.73	1120.07	53.	82.	0.041	59.04	1.639
K-40	2921.52	1460.25	15.	591.	0.295	13.08	2.105
BI-214	3528.38	1763.47	2.	38.	0.019	53.97	1.729s

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		2.6302E-01					
			477.56	2.630E-01	%(	6.855E-01 2.05E-01 G	
K-40		1.6694E+01					
			1460.75	1.669E+01	(	5.899E-01 7.28E-01 G	
MN-54		2.1531E-03					
			834.81	2.153E-03	%(	8.273E-02 2.36E-02 G	
CO-57		1.2438E-03					
			122.07	1.244E-03	%(P	5.855E-02 1.73E-02 G K	
			136.43	4.476E-02	&	4.546E-01 1.35E-01 G	
CO-60		8.4941E-03					
			1332.51	8.494E-03	%(P	7.614E-02 2.01E-02 G K	
			1173.23	1.801E-02	% P	9.257E-02 2.60E-02 G K	
Sr-85		-2.2310E-02					
			514.00	-2.231E-02	%(	1.024E-01 3.03E-02 G	
Kr-85		-3.6945E+02					
			513.99	-3.694E+02	%(	1.695E+03 5.02E+02 G	
Y-88		-1.1310E-03					
			1836.01	-1.131E-03	&(P	3.379E-02 4.59E-03 G K	
			898.02	-1.005E-02	& P	8.768E-02 2.47E-02 G	
NB-94		4.1527E-04					
			871.10	4.153E-04	%(	6.093E-02 1.69E-02 G K	
			702.50	1.781E-02	&	5.940E-02 1.75E-02 G K	

Yankee Chemistry Spectrum name: 101F_3JAN2005_1830.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	1.8653E-03						
		722.95	1.865E-03	%(	5.681E-02	1.59E-02	G K
		614.37	-3.056E-03	&	6.407E-02	1.83E-02	G
		433.93	5.221E-03	%	5.702E-02	1.66E-02	G
CD-109	1.0206E+00						
		88.04	1.021E+00	(	1.299E+00	4.00E-01	G
SN-113	-1.0807E-02						
		391.71	-1.081E-02	%(P	1.010E-01	2.94E-02	G K
		255.04	-6.096E-01	%	2.814E+00	8.38E-01	G
SB-125	5.2877E-02						
		427.95	5.288E-02	%(	1.754E-01	5.22E-02	G K
		600.77	3.050E-02	%	2.691E-01	7.69E-02	G
		636.15	3.643E-02	%	4.804E-01	1.37E-01	G
		463.51	3.712E-01	%	5.273E-01	1.64E-01	G
		176.29	1.303E-01	%	7.949E-01	2.37E-01	G
I-131	1.2068E-01						
		364.48	1.207E-01	&(	8.291E-01	2.43E-01	G K
		636.97	9.550E-01	%	1.089E+01	3.11E+00	G
		284.29	-2.514E+00	%	1.156E+01	3.44E+00	G
CS-134	0.0000E+00						
		604.66	0.000E+00	%(	1.834E-01	5.45E-02	G K
		795.76	-2.069E-04	%	7.077E-02	1.97E-02	G
		569.29	1.606E-01	%	3.052E-01	9.33E-02	G
		801.84	1.739E-02	%	5.512E-01	1.51E-01	G
CS-137	2.0864E-01						
		661.62	2.086E-01	(	7.115E-02	3.38E-02	G
CE-139	8.9635E-04						
		165.85	8.963E-04	%(P	7.013E-02	2.08E-02	G
EU-152	1.6068E-01						
		121.78	2.919E-02	%(	1.728E-01	5.17E-02	G K
		344.30	-5.539E-02	%	1.886E-01	5.63E-02	G
		1408.08	-1.452E-02	%	2.877E-01	7.72E-02	G
		964.00	4.244E-01	*(	4.672E-01	1.52E-01	G
		1112.07	8.006E-02	&	5.301E-01	1.51E-01	G
		778.90	3.943E-02	%	4.176E-01	1.18E-01	G
EU-154	1.7120E-01						
		123.10	1.606E-04	%(	1.238E-01	3.67E-02	G K
		1274.80	1.956E-02	&	2.180E-01	6.11E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	5.225E-01	?(	2.257E-01	9.02E-02	G
		1004.80	-5.689E-02	%	3.856E-01	1.10E-01	G
EU-155	2.2379E-01						
		86.45	2.238E-01	(	2.159E-01	6.68E-02	G K
		105.31	7.019E-02	&	2.503E-01	7.53E-02	G
HG-203	-1.4130E-03						
		279.17	-1.413E-03	&(P	8.609E-02	2.49E-02	G K
		72.87	-1.082E+00	&	2.469E+00	7.48E-01	G
		70.83	1.564E-01	%	4.246E+00	1.27E+00	G
		82.50	-1.968E+00	%	5.145E+00	1.56E+00	G
TL-208	4.0546E-01						
		583.14	4.055E-01	(	8.450E-02	4.29E-02	G
		510.72	7.392E-01	+	2.394E-01	1.05E-01	G
PB-212	8.5742E-01						
							Energy duplication
		238.63	8.613E-01	(	1.269E-01	5.04E-02	G K
							Energy duplication
		77.11	8.478E-01	(	4.412E-01	1.41E-01	G
		74.81	1.218E+00	&	8.806E-01	2.75E-01	G
PB-214	7.5547E-01						
		351.99	7.152E-01	@(	1.279E-01	5.42E-02	G K
		295.22	8.332E-01	(	2.276E-01	8.58E-02	G
							Energy duplication
		77.11	1.387E+00	+	7.216E-01	2.30E-01	G
		241.92	6.123E-01	%	8.947E-01	2.74E-01	G
BI-212	8.8649E-01						
		727.17	8.865E-01	*(	4.559E-01	1.80E-01	G K
		1620.56	1.241E-02	&	2.225E+00	5.77E-01	G
		785.42	8.074E-01	%	3.025E+00	8.87E-01	G
BI-214	8.4829E-01						
		609.32	8.488E-01	(	1.367E-01	7.17E-02	G K
		1764.51	8.468E-01	*(	2.236E-01	1.52E-01	G
		1120.28	1.310E+00	+	5.829E-01	2.58E-01	G
RA-224	2.0540E+00						
		241.00	2.054E+00	(	1.448E+00	4.61E-01	G
RA-226	2.0807E+00						
		185.99	2.081E+00	*(	1.520E+00	4.82E-01	G
AC-228	1.1256E+00						
		911.07	1.105E+00	@(	2.266E-01	1.18E-01	G K
		968.90	1.035E+00	(	4.330E-01	1.94E-01	G
		338.40	1.306E+00	(	4.562E-01	1.90E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-1.2852E-01						
		236.00	-1.285E-01	%(	5.564E-01	1.67E-01	G K
		256.25	4.671E-02	%	7.007E-01	2.06E-01	G
PA-234	-1.0193E-02						
		98.44	-1.019E-02	&(	2.290E-01	6.82E-02	G K
		946.00	3.552E-02	&	3.264E-01	9.26E-02	G
		131.28	-2.545E-02	%	2.742E-01	8.18E-02	G
		94.67	-3.947E-04	%	4.067E-01	1.21E-01	G
		883.24	1.408E-01	%	4.252E-01	1.25E-01	G
		926.70	1.904E-01	%	4.991E-01	1.49E-01	G
		569.26	2.309E-01	%	4.401E-01	1.34E-01	G
TH-234	1.6132E+00						
		63.29	1.073E+00	%(	2.768E+00	8.36E-01	G K
		92.80	2.316E+00	(	2.079E+00	6.46E-01	G
		92.38	3.341E-01	&	2.507E+00	7.50E-01	G
AM-241	4.9868E-04						
		59.54	4.987E-04	%(P	3.700E-01	1.10E-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

Yankee Chemistry Spectrum name: 101F_3JAN2005_1830.An1

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	1.7551E-01	2.6302E-01	6.1619E-01	6.1637E-01	4.574E-01
K-40		1.6694E+01	1.6694E+01	2.1840E+00	2.3789E+00	
MN-54	#A	2.0091E-03	2.1531E-03	7.0701E-02	7.0701E-02	7.720E-02
CO-57	#B	1.1481E-03	1.2438E-03	5.2015E-02	5.2015E-02	5.405E-02
CO-60	#B	8.3994E-03	8.4941E-03	6.0341E-02	6.0343E-02	7.529E-02
Sr-85	#A	-1.5988E-02	-2.2310E-02	9.0997E-02	9.1005E-02	7.339E-02
Kr-85	#A	-3.6936E+02	-3.6945E+02	1.5059E+03	1.5061E+03	1.694E+03
Y-88	#B	-9.2352E-04	-1.1310E-03	6.7858E-03	6.7861E-03	2.759E-02
NB-94	#B	4.1526E-04	4.1527E-04	5.0800E-02	5.0800E-02	6.093E-02
Ag-108M	#B	1.8644E-03	1.8653E-03	4.7606E-02	4.7606E-02	5.678E-02
CD-109	A	9.7314E-01	1.0206E+00	1.2013E+00	1.2026E+00	
SN-113	#B	-8.9579E-03	-1.0807E-02	1.2920E-01	1.2920E-01	8.372E-02
SB-125	#B	5.1760E-02	5.2877E-02	1.5658E-01	1.5661E-01	1.717E-01
I-131	#B	8.2183E-03	1.2068E-01	7.2875E-01	7.2878E-01	5.647E-02
CS-134	#B	0.0000E+00	0.0000E+00	1.6341E-01	1.6341E-01	1.782E-01
CS-137		2.0823E-01	2.0864E-01	1.0131E-01	1.0199E-01	
CE-139	#A	7.6603E-04	8.9635E-04	6.2255E-02	6.2255E-02	5.993E-02
EU-152	#B	1.5993E-01	1.6068E-01	1.7231E-01	1.7255E-01	1.720E-01
EU-154	#F	1.7001E-01	1.7120E-01	8.8711E-02	8.9217E-02	1.229E-01
EU-155	#	2.2114E-01	2.2379E-01	2.0038E-01	2.0076E-01	2.133E-01
HG-203	#B	-8.8873E-04	-1.4130E-03	1.1602E-01	1.1602E-01	5.415E-02
TL-208		4.0546E-01	4.0546E-01	1.2886E-01	1.3088E-01	
PB-212	#	8.5742E-01	8.5742E-01	1.5056E-01	1.5817E-01	1.269E-01
PB-214	#	7.5547E-01	7.5547E-01	1.4490E-01	1.5105E-01	1.279E-01
BI-212	#	8.8649E-01	8.8649E-01	5.4021E-01	5.4252E-01	
BI-214		8.4829E-01	8.4829E-01	2.1500E-01	2.2028E-01	
RA-224		2.0540E+00	2.0540E+00	1.3845E+00	1.3893E+00	
RA-226	#	2.0806E+00	2.0807E+00	1.4460E+00	1.4508E+00	1.520E+00
AC-228		1.1256E+00	1.1256E+00	2.9270E-01	2.9953E-01	
TH-227	#B	-1.2852E-01	-1.2852E-01	4.9996E-01	5.0001E-01	5.564E-01
PA-234	#B	-1.0193E-02	-1.0193E-02	2.0459E-01	2.0459E-01	2.290E-01
TH-234	#B	1.6132E+00	1.6132E+00	1.3502E+00	1.3532E+00	2.768E+00
AM-241	#A	4.9861E-04	4.9868E-04	3.2979E-01	3.2979E-01	3.700E-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

Yankee Chemistry Spectrum name: 101F_3JAN2005_1830.An1

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

Total Activity (269.6 to 1999.1 keV) 2.3195120E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 2.3243029E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_3JAN2005_1910.An1

Sample description
FSS-OOL-04-01-018-F SOIL REPEAT

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_3JAN2005_1910.An1

Acquisition information
Start time: 03-Jan-2005 19:03:03
Live time: 2000
Real time: 2003
Dead time: 0.15 %
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: 1.5190E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5190E+03) =
6.5833E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_3JAN2005_1910.An1

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	03-Dec-2004 14:28:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2753

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.71	180.	27.45	1.50	1.654E-02	74.81	9.600	1.008E+00	PB212
77.11	378.	12.74	1.50	1.720E-02	77.11	10.700	1.827E+00	PB214
					77.11	17.500	1.117E+00	PB212
77.11	378.	12.74	1.50	1.720E-02	77.11	10.700	1.827E+00	PB214
					77.11	17.500	1.117E+00	PB212
84.32	78.	36.89	1.01	1.874E-02				
86.87	168.	17.52	1.01	1.914E-02	86.45	32.740	2.424E-01	EU155
89.77	97.	28.37	1.02	1.954E-02	88.04	3.790	1.242E+00	CD109
93.61	103.	27.83	1.02	1.997E-02	92.38	2.570	1.800E+00	TH234
					92.80	3.000	1.538E+00	TH234
98.87	64.	41.08	0.94	2.042E-02				
185.72	169.	23.15	1.28	1.860E-02				
185.72	169.	23.15	1.28	1.860E-02	185.99	3.280	2.464E+00	RA226
209.24	82.	32.49	0.88	1.722E-02				
238.66	850.	4.00	1.12	1.557E-02	238.63	43.100	1.127E+00	PB212
241.80	133.	18.01	1.12	1.541E-02	241.00	3.900	1.963E+00	RA224
					241.92	7.470	1.028E+00	PB214
295.14	250.	10.54	1.29	1.292E-02				
295.14	250.	10.54	1.29	1.292E-02	295.22	19.200	8.984E-01	PB214
300.15	51.	35.90	0.65	1.272E-02				
338.32	144.	16.57	1.15	1.135E-02	338.40	12.010	9.372E-01	AC228
351.91	393.	6.71	1.16	1.093E-02				
351.91	393.	6.71	1.16	1.093E-02	351.99	37.100	8.626E-01	PB214
462.46	80.	21.90	1.33	8.360E-03				
462.46	80.	21.90	1.33	8.360E-03	463.51	10.000	8.684E-01	SB125
510.40	104.	17.83	1.24	7.595E-03	510.72	22.500	5.417E-01	TL208

582.86	240.	9.59	1.40	6.687E-03	583.14	86.000	3.708E-01	TL208
609.00	265.	9.48	1.42	6.416E-03	609.32	46.090	7.964E-01	BI214
726.88	71.	22.67	1.08	5.445E-03	727.17	11.800	9.848E-01	BI212
794.61	30.	33.46	1.50	5.016E-03	795.76	85.400	PBC<MDA	CS134
910.85	161.	12.76	1.20	4.447E-03	911.07	29.000	1.112E+00	AC228
968.37	115.	13.59	1.66	4.214E-03	968.90	17.460	1.390E+00	AC228
1119.70	74.	22.29	1.86	3.712E-03	1120.28	15.040	1.188E+00	BI214

Yankee Chemistry Spectrum name: 101F_3JAN2005_1910.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1460.17	640.	4.02	1.82	2.943E-03	1460.75	10.700	1.809E+01	K40
1764.03	36.	16.67	2.00	2.481E-03	1764.51	15.920	8.107E-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	
168.21	84.21	379.	78.	0.039	110.67	1.012	TA-182	lD
179.11	89.66	334.	97.	0.049	85.12	1.016	PB-214	lD
418.15	209.24	287.	82.	0.041	97.46	0.876	AC-228	
477.02	238.66	153.	850.	0.425	12.00	1.122	PB-212	D
600.06	300.15	134.	51.	0.025	105.70	0.650	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	148.99	74.71	1129.	180.	0.090	82.36	1.499s
PB-214	153.79	77.11	971.	378.	0.189	38.23	1.499D
PB-212	153.79	77.11	971.	378.	0.189	38.23	1.499D
EU-155	173.78	87.10	932.	161.	0.080	83.98	1.499
TH-234	185.51	92.97	875.	147.	0.074	88.66	1.499s
TH-234	185.63	93.02	812.	162.	0.081	78.37	1.499s
RA-226	371.65	186.00	507.	144.	0.072	70.89	1.499s
PB-212	477.00	238.65	445.	637.	0.319	18.39	1.499
RA-224	481.70	241.00	435.	103.	0.052	90.65	1.123D
PB-214	590.30	295.28	187.	227.	0.114	32.38	1.499
AC-228	676.42	338.32	156.	144.	0.072	49.70	1.152
PB-214	703.60	351.90	127.	369.	0.184	20.32	1.499
SB-125	925.74	462.92	95.	54.	0.027	87.27	1.499s
TL-208	1020.74	510.40	80.	104.	0.052	53.50	1.235s
TL-208	1165.74	582.86	87.	240.	0.120	28.77	1.398
BI-214	1218.03	609.00	110.	265.	0.132	28.43	1.424
BI-212	1453.91	726.88	61.	71.	0.036	68.02	1.083
CS-134	1589.45	794.61	36.	30.	0.015	100.39	1.502
AC-228	1822.06	910.85	73.	161.	0.081	38.29	1.199
AC-228	1937.14	968.37	39.	115.	0.057	40.78	1.655
BI-214	2240.00	1119.70	58.	74.	0.037	66.87	1.863
K-40	2921.36	1460.17	7.	640.	0.320	12.07	1.820

Yankee Chemistry Spectrum name: 101F_3JAN2005_1910.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3529.50	1764.03	0.	36.	0.018	50.00	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	Peak Code	Peak MDA Value pCi/gm	Peak COMMENTS
BE-7		-1.3977E-02					
			477.56	-1.398E-02	&(	7.502E-01	2.15E-01 G
K-40		1.8087E+01					
			1460.75	1.809E+01	(	4.225E-01	7.27E-01 G
MN-54		2.4188E-02					
			834.81	2.419E-02	%(	6.887E-02	2.05E-02 G
CO-57		-2.3990E-03					
			122.07	-2.399E-03	&(P	6.468E-02	1.92E-02 G K
			136.43	-8.062E-02	&	5.313E-01	1.59E-01 G
CO-60		-1.8259E-02					
			1332.51	-1.826E-02	%(P	8.025E-02	1.96E-02 G K
			1173.23	-1.745E-02	& P	9.303E-02	2.44E-02 G K
Sr-85		-4.1836E-02					
			514.00	-4.184E-02	&(	1.009E-01	3.04E-02 G
Kr-85		-6.9214E+02					
			513.99	-6.921E+02	&(	1.670E+03	5.03E+02 G
Y-88		-2.3408E-03					
			1836.01	-2.341E-03	%(P	6.875E-02	1.70E-02 G K
			898.02	1.259E-02	& P	8.350E-02	2.38E-02 G
NB-94		8.8464E-03					
			871.10	8.846E-03	%(	5.965E-02	1.70E-02 G K
			702.50	2.626E-02	%	5.502E-02	1.67E-02 G K
Ag-108M		1.9132E-03					
			722.95	1.913E-03	%(	1.370E-01	4.01E-02 G K
			614.37	-1.572E-02	%	7.124E-02	2.09E-02 G
			433.93	-1.229E-03	%	5.644E-02	1.63E-02 G

Yankee Chemistry Spectrum name: 101F_3JAN2005_1910.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	-2.4361E-02						
		88.04	-2.436E-02	&(	1.832E+00	5.46E-01	G
SN-113	2.1759E-02						
		391.71	2.176E-02	&(P	8.829E-02	2.60E-02	G K
		255.04	1.928E-01	%	2.846E+00	8.39E-01	G
SB-125	1.8312E-01						
		427.95	4.723E-02	%(	1.778E-01	5.27E-02	G K
		600.77	9.032E-02	%	3.635E-01	1.07E-01	G
		636.15	-3.130E-02	&	5.295E-01	1.51E-01	G
		463.51	5.854E-01	@(	5.251E-01	1.70E-01	G
		176.29	-5.824E-02	%	8.045E-01	2.39E-01	G
I-131	-1.0442E-01						
		364.48	-1.044E-01	&(	8.824E-01	2.58E-01	G K
		636.97	-4.094E-03	%	1.103E+01	3.11E+00	G
		284.29	-1.896E+00	%	1.214E+01	3.60E+00	G
CS-134	3.1820E-02						
		604.66	3.092E-03	%(	1.811E-01	5.38E-02	G K
		795.76	6.465E-02	(	6.564E-02	2.16E-02	G
		569.29	-2.096E-02	&	3.538E-01	1.01E-01	G
		801.84	5.188E-02	%	6.400E-01	1.80E-01	G
CS-137	4.2648E-02						
		661.62	4.265E-02	&(	7.143E-02	2.20E-02	G
CE-139	2.7120E-05						
		165.85	2.712E-05	&(P	6.907E-02	2.04E-02	G
EU-152	5.0332E-05						
		121.78	5.033E-05	&(	1.802E-01	5.35E-02	G K
		344.30	-3.595E-02	%	1.861E-01	5.50E-02	G
		1408.08	4.384E-02	%	2.747E-01	7.61E-02	G
		964.00	2.986E-01	&	5.545E-01	1.70E-01	G
		1112.07	3.981E-02	%	4.508E-01	1.25E-01	G
		778.90	6.401E-02	&	4.534E-01	1.30E-01	G
EU-154	4.4227E-03						
		123.10	4.423E-03	%(	1.103E-01	3.27E-02	G K
		1274.80	5.424E-03	%	2.403E-01	6.70E-02	G
		723.30	0.000E+00	%	6.029E-01	1.76E-01	G
		1004.80	-3.992E-02	%	3.469E-01	9.76E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	2.3154E-01						
		86.45	2.315E-01	(	2.088E-01	6.48E-02	G K
		105.31	3.944E-02	%	2.566E-01	7.67E-02	G
HG-203	1.6527E-04						
		279.17	1.653E-04	%(P	9.276E-02	2.70E-02	G K
		72.87	-6.026E-01	%	2.372E+00	7.14E-01	G
		70.83	-1.544E+00	&	4.249E+00	1.28E+00	G
		82.50	-2.013E+00	%	5.170E+00	1.56E+00	G
TL-208	3.7079E-01						
		583.14	3.708E-01	(	7.161E-02	3.55E-02	G
		510.72	5.417E-01	+	2.312E-01	9.66E-02	G
PB-212	8.4475E-01						
		238.63	8.448E-01	(	1.339E-01	5.18E-02	G K
							Energy duplication
		77.11	1.117E+00	+	4.371E-01	1.42E-01	G
		74.81	1.008E+00	+	8.925E-01	2.77E-01	G
PB-214	8.1102E-01						
		351.99	8.090E-01	(	1.213E-01	5.48E-02	G K
		295.22	8.148E-01	(	2.383E-01	8.80E-02	G
							Energy duplication
		77.11	1.827E+00	+	7.148E-01	2.33E-01	G
		241.92	4.838E-02	%	1.032E+00	3.08E-01	G
BI-212	9.8484E-01						
		727.17	9.848E-01	(	5.413E-01	2.23E-01	G K
		1620.56	4.720E-01	&	1.778E+00	5.01E-01	G
		785.42	8.043E-01	%	3.121E+00	9.15E-01	G
BI-214	8.0011E-01						
		609.32	7.964E-01	(	1.555E-01	7.54E-02	G K
		1764.51	8.107E-01	(	1.660E-01	1.35E-01	G
		1120.28	1.188E+00	+	6.065E-01	2.65E-01	G
RA-224	1.5240E+00						
		241.00	1.524E+00	(	1.475E+00	4.61E-01	G
RA-226	2.1016E+00						
		185.99	2.102E+00	*(	1.571E+00	4.97E-01	G
AC-228	1.2165E+00						
		911.07	1.112E+00	(	2.930E-01	1.42E-01	G K
		968.90	1.390E+00	(	3.853E-01	1.89E-01	G
		338.40	9.372E-01	-	3.980E-01	1.55E-01	G

Yankee Chemistry Spectrum name: 101F_3JAN2005_1910.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-2.7510E-01						
		236.00	-2.751E-01	&(	6.262E-01	1.90E-01	G K
		256.25	-1.179E-01	%	7.238E-01	2.15E-01	G
PA-234	-8.8501E-02						
		98.44	-8.850E-02	%(	2.233E-01	6.75E-02	G K
		946.00	-3.075E-04	%	3.355E-01	9.33E-02	G
		131.28	-6.745E-03	&	2.786E-01	8.29E-02	G
		94.67	-1.549E-02	%	4.059E-01	1.21E-01	G
		883.24	-4.502E-03	%	5.662E-01	1.59E-01	G
		926.70	-1.039E-01	%	6.193E-01	1.78E-01	G
		569.26	-6.403E-02	&	5.205E-01	1.50E-01	G
TH-234	2.0893E+00						
		63.29	1.525E+00	%(	2.795E+00	8.50E-01	G K
		92.80	2.411E+00	(	2.020E+00	6.30E-01	G
		92.38	2.570E+00	&(	2.451E+00	7.60E-01	G
AM-241	-9.1948E-02						
		59.54	-9.195E-02	&(P	4.009E-01	1.20E-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:	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	-9.3237E-03	-1.3977E-02	6.4516E-01	6.4516E-01	5.004E-01
K-40		1.8087E+01	1.8087E+01	2.1825E+00	2.4099E+00	
MN-54	#A	2.2570E-02	2.4188E-02	6.1426E-02	6.1441E-02	6.426E-02
CO-57	#B	-2.2144E-03	-2.3990E-03	1.0529E-01	1.0529E-01	5.970E-02
CO-60	#B	-1.8055E-02	-1.8259E-02	7.5960E-01	7.5960E-01	7.935E-02
Sr-85	#A	-2.9974E-02	-4.1836E-02	9.1272E-02	9.1303E-02	7.230E-02
Kr-85	#A	-6.9198E+02	-6.9214E+02	1.5100E+03	1.5105E+03	1.669E+03
Y-88	#B	-1.9111E-03	-2.3408E-03	1.4597E-01	1.4597E-01	5.613E-02
NB-94	#B	8.8464E-03	8.8464E-03	5.1086E-02	5.1089E-02	5.965E-02
Ag-108M	#B	1.9123E-03	1.9132E-03	1.2039E-01	1.2039E-01	1.369E-01
CD-109	#A	-2.3226E-02	-2.4361E-02	1.6375E+00	1.6375E+00	1.747E+00
SN-113	#B	1.8033E-02	2.1759E-02	7.8146E-02	7.8156E-02	7.317E-02
SB-125	#F	1.7925E-01	1.8312E-01	1.5980E-01	1.6013E-01	1.741E-01
I-131	#B	-7.0951E-03	-1.0442E-01	7.7499E-01	7.7501E-01	5.995E-02
CS-134	#B	3.0920E-02	3.1820E-02	3.1943E-02	3.1994E-02	1.759E-01
CS-137	#A	4.2565E-02	4.2648E-02	6.6029E-02	6.6073E-02	7.129E-02
CE-139	#A	2.3174E-05	2.7120E-05	6.1251E-02	6.1251E-02	5.902E-02
EU-152	#B	5.0098E-05	5.0332E-05	1.6053E-01	1.6053E-01	1.794E-01
EU-154	#B	4.3920E-03	4.4227E-03	9.8039E-02	9.8040E-02	1.095E-01
EU-155	#	2.2880E-01	2.3154E-01	1.9444E-01	1.9487E-01	2.063E-01
HG-203	#B	1.0391E-04	1.6527E-04	8.0856E-02	8.0856E-02	5.832E-02
TL-208		3.7079E-01	3.7079E-01	1.0668E-01	1.0872E-01	
PB-212	#	8.4475E-01	8.4475E-01	1.5537E-01	1.6254E-01	1.339E-01
PB-214	#	8.1102E-01	8.1102E-01	1.5502E-01	1.6165E-01	1.213E-01
BI-212		9.8484E-01	9.8484E-01	6.6990E-01	6.7221E-01	
BI-214		8.0011E-01	8.0011E-01	2.2750E-01	2.3195E-01	
RA-224		1.5240E+00	1.5240E+00	1.3816E+00	1.3843E+00	
RA-226	#	2.1015E+00	2.1016E+00	1.4897E+00	1.4945E+00	1.571E+00
AC-228		1.2165E+00	1.2165E+00	3.4024E-01	3.4712E-01	
TH-227	#B	-2.7510E-01	-2.7510E-01	5.6872E-01	5.6894E-01	6.262E-01
PA-234	#B	-8.8501E-02	-8.8501E-02	2.0250E-01	2.0256E-01	2.233E-01
TH-234	#B	2.0893E+00	2.0893E+00	1.4268E+00	1.4315E+00	2.795E+00
AM-241	#A	-9.1936E-02	-9.1948E-02	3.6700E-01	3.6703E-01	4.008E-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

Yankee Chemistry Spectrum name: 101F_3JAN2005_1910.An1

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

Total Activity (295.1 to 1999.1 keV) 2.2983181E+01 pCi/gm
Total Decayed Activity (295.1 to 1999.1 keV) 2.2983181E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_3JAN2005_1950.An1

Sample description
FSS-OOL-04-01-002-F SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_3JAN2005_1950.An1

Acquisition information

Start time:	03-Jan-2005 19:40:29
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:	1.2450E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.2450E+03) = 8.0321E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_3JAN2005_1950.An1

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	03-Dec-2004 11:40:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 23 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1602

***** 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
74.79	212.	13.62	1.00	1.651E-02	74.81	9.600	1.448E+00	PB212
77.05	317.	9.57	1.01	1.717E-02	77.11	17.500	1.143E+00	PB212
					77.11	10.700	1.869E+00	PB214
86.98	109.	35.67	1.50	1.910E-02	86.45	32.740	PBC<MDA	EU155
92.96	98.	36.29	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.777E+00	TH234
92.98	99.	36.18	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.809E+00	TH234
128.90	66.	41.37	0.85	2.110E-02				
185.78	159.	19.80	1.20	1.860E-02	185.99	3.280	2.824E+00	RA226
209.56	55.	41.34	1.18	1.720E-02				
238.62	630.	4.65	1.12	1.558E-02	238.63	43.100	1.018E+00	PB212
241.57	136.	14.91	1.12	1.543E-02	241.00	3.900	2.453E+00	RA224
					241.92	7.470	1.285E+00	PB214
295.21	193.	9.20	1.16	1.292E-02	295.22	19.200	8.460E-01	PB214
299.92	45.	28.41	1.16	1.273E-02				
338.38	106.	20.57	0.95	1.135E-02	338.40	12.010	8.465E-01	AC228
351.79	314.	7.26	1.25	1.093E-02	351.99	37.100	8.398E-01	PB214
462.92	48.	29.01	0.94	8.352E-03				
462.92	48.	29.01	0.94	8.352E-03	463.51	10.000	6.355E-01	SB125
510.27	84.	21.02	1.17	7.597E-03	510.72	22.500	5.313E-01	TL208
582.93	211.	10.93	1.23	6.687E-03	583.14	86.000	3.976E-01	TL208
609.12	216.	8.62	1.29	6.415E-03	609.32	46.090	7.940E-01	BI214
661.39	125.	16.92	1.56	5.939E-03	661.62	84.620	2.697E-01	CS137
726.88	40.	26.81	1.05	5.445E-03	727.17	11.800	6.760E-01	BI212
794.71	23.	32.37	1.50	5.016E-03	795.76	85.400	6.056E-02	CS134

910.82	120.	12.78	1.56	4.448E-03	911.07	29.000	1.006E+00	AC228
968.63	104.	15.28	1.41	4.213E-03	968.90	17.460	1.532E+00	AC228
1119.46	49.	26.77	1.28	3.713E-03	1120.28	15.040	9.549E-01	BI214

Yankee Chemistry Spectrum name: 101F_3JAN2005_1950.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1460.36	490.	4.52	2.10	2.943E-03	1460.75	10.700	1.689E+01	K40
1763.73	39.	16.01	1.53	2.481E-03	1764.51	15.920	1.072E+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
257.40	128.90	327.	66.	0.033	121.39	0.853	AC-228
418.80	209.56	210.	55.	0.027	124.02	1.184	AC-228
599.60	299.93	60.	45.	0.023	85.23	1.165	TH-227 lD

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

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
HG-203	146.54	73.49	827.	-128.	-0.064	98.91	1.499s
PB-212	149.19	74.81	271.	211.	0.106	38.99	1.005D
PB-212	153.79	77.11	302.	228.	0.114	35.61	1.006A
EU-155	173.53	86.98	706.	109.	0.055	107.02	1.499
TH-234	185.55	92.98	598.	99.	0.050	108.55	1.499s
TH-234	185.50	92.96	580.	98.	0.049	108.86	1.499s
RA-226	371.21	185.78	318.	159.	0.079	59.41	1.203s
PB-212	476.96	238.63	114.	630.	0.315	13.95	1.121D
RA-224	481.70	241.00	333.	78.	0.039	109.74	1.123D
PB-214	483.54	241.92	172.	92.	0.046	59.97	1.124A
PB-214	590.23	295.24	175.	209.	0.105	37.86	0.998
AC-228	676.56	338.39	144.	108.	0.054	62.80	0.951
PB-214	703.37	351.79	85.	314.	0.157	21.78	1.250
SB-125	925.81	462.96	65.	46.	0.023	87.18	1.499
TL-208	1020.48	510.27	70.	84.	0.042	63.07	1.171s
TL-208	1165.86	582.93	86.	211.	0.105	32.80	1.226s
BI-214	1218.28	609.12	47.	216.	0.108	25.86	1.291
CS-137	1322.87	661.39	86.	125.	0.062	50.75	1.559
BI-212	1453.92	726.88	30.	40.	0.020	80.43	1.053
CS-134	1589.64	794.71	17.	23.	0.012	97.10	1.502
AC-228	1821.99	910.82	32.	120.	0.060	38.34	1.564
AC-228	1937.67	968.63	35.	104.	0.052	45.85	1.406
BI-214	2239.50	1119.46	40.	49.	0.025	80.32	1.277
K-40	2921.73	1460.36	0.	490.	0.245	13.55	2.096

Yankee Chemistry Spectrum name: 101F_3JAN2005_1950.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3528.89	1763.73	0.	39.	0.020	48.04	1.530s

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

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

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	Peak	COMMENTS
BE-7		2.8224E-01						
			477.56	2.822E-01	%(	8.452E-01	2.52E-01	G
K-40		1.6893E+01						
			1460.75	1.689E+01	(	2.541E-01	7.63E-01	G
MN-54		1.3644E-02						
			834.81	1.364E-02	%(	7.031E-02	2.02E-02	G
CO-57		1.2722E-02						
			122.07	1.272E-02	%(P	6.941E-02	2.07E-02	G K
			136.43	-2.322E-02	&	5.641E-01	1.67E-01	G
CO-60		-8.5470E-04						
			1332.51	-8.547E-04	%(P	9.525E-02	2.45E-02	G K
			1173.23	7.130E-03	% P	9.724E-02	2.62E-02	G K
Sr-85		-3.7066E-02						
			514.00	-3.707E-02	%(	1.068E-01	3.20E-02	G
Kr-85		-6.1227E+02						
			513.99	-6.123E+02	%(	1.765E+03	5.28E+02	G
Y-88		-1.3814E-03						
			1836.01	-1.381E-03	%(P	4.127E-02	5.60E-03	G K
			898.02	-6.341E-04	% P	1.016E-01	2.81E-02	G
NB-94		3.4506E-03						
			871.10	3.451E-03	%(	5.647E-02	1.55E-02	G K
			702.50	-6.819E-03	%	6.885E-02	1.96E-02	G K
Ag-108M		-1.7160E-02						
			722.95	-1.716E-02	%(	8.183E-02	2.38E-02	G K
			614.37	-1.096E-02	%	6.623E-02	1.91E-02	G
			433.93	0.000E+00	%	6.808E-02	1.95E-02	G

Yankee Chemistry Spectrum name: 101F_3JAN2005_1950.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	1.8167E-01						
		88.04	1.817E-01	%(	2.072E+00	6.18E-01	G
SN-113	-1.4314E-02						
		391.71	-1.431E-02	%(P	1.032E-01	2.98E-02	G K
		255.04	-6.949E-02	%	3.037E+00	8.88E-01	G
SB-125	1.3172E-01						
		427.95	-2.831E-02	%(	1.796E-01	5.22E-02	G K
		600.77	-2.614E-02	%	3.320E-01	9.44E-02	G
		636.15	1.078E-01	&	4.412E-01	1.28E-01	G
		463.51	6.054E-01	(	5.347E-01	1.76E-01	G
		176.29	0.000E+00	&	8.421E-01	2.48E-01	G
I-131	1.2368E-01						
		364.48	1.237E-01	%(	7.964E-01	2.31E-01	G K
		636.97	-2.043E+00	%	1.219E+01	3.51E+00	G
		284.29	2.937E+00	&	1.211E+01	3.59E+00	G
CS-134	2.6248E-02						
		604.66	-3.773E-03	%(	1.830E-01	5.41E-02	G K
		795.76	6.056E-02	(	5.663E-02	1.96E-02	G
		569.29	-2.632E-02	%	4.231E-01	1.21E-01	G
		801.84	1.125E-01	&	7.766E-01	2.21E-01	G
CS-137	2.6971E-01						
		661.62	2.697E-01	(	9.963E-02	4.56E-02	G
CE-139	1.5501E-02						
		165.85	1.550E-02	%(P	7.805E-02	2.33E-02	G
EU-152	2.9034E-02						
		121.78	2.903E-02	&(	1.887E-01	5.63E-02	G K
		344.30	-8.070E-03	%	1.970E-01	5.71E-02	G
		1408.08	1.606E-01	%	2.517E-01	8.14E-02	G
		964.00	3.156E-01	&	5.996E-01	1.83E-01	G
		1112.07	1.044E-01	&	5.834E-01	1.66E-01	G
		778.90	1.352E-02	&	4.154E-01	1.14E-01	G
EU-154	2.8086E-02						
		123.10	2.809E-02	%(	1.335E-01	3.99E-02	G K
		1274.80	6.026E-03	%	2.247E-01	6.10E-02	G
		723.30	-8.293E-02	%	3.962E-01	1.16E-01	G
		1004.80	-8.126E-03	&	4.134E-01	1.13E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.9211E-01						
		86.45	1.921E-01	(	2.223E-01	6.85E-02	G K
		105.31	5.785E-02	%	2.650E-01	7.93E-02	G
HG-203	5.4749E-02						
		279.17	5.475E-02	&(P	8.918E-02	2.72E-02	G K
		72.87	-7.654E-01	&	2.561E+00	7.72E-01	G
		70.83	-4.161E+00	-	4.443E+00	1.37E+00	G
		82.50	1.909E-01	%	4.805E+00	1.43E+00	G
TL-208	3.9764E-01						
		583.14	3.976E-01	@(	8.690E-02	4.35E-02	G
		510.72	5.313E-01	+	2.657E-01	1.12E-01	G
PB-212	1.0540E+00						
		238.63	1.018E+00	(	8.473E-02	4.73E-02	G K
							Energy duplication
		77.11	8.208E-01	}	3.018E-01	9.74E-02	G
		74.81	1.443E+00	+	5.425E-01	1.87E-01	G
PB-214	8.6776E-01						
		351.99	8.398E-01	(	1.226E-01	6.10E-02	G K
		295.22	9.162E-01	(	2.813E-01	1.16E-01	G
							Energy duplication
		77.11	1.718E-01	}	6.789E-01	2.00E-01	G
		241.92	8.678E-01	}	6.014E-01	1.73E-01	G
BI-212	6.7599E-01						
		727.17	6.760E-01	(	4.771E-01	1.81E-01	G K
		1620.56	-2.663E-01	%	2.133E+00	5.62E-01	G
		785.42	1.181E+00	%	2.785E+00	8.37E-01	G
BI-214	8.3357E-01						
		609.32	7.940E-01	(	1.270E-01	6.84E-02	G K
		1764.51	1.072E+00	+	2.025E-01	1.72E-01	G
		1120.28	9.549E-01	(	6.252E-01	2.56E-01	G
RA-224	1.4046E+00						
							Derived Ave Activity
		241.00	1.405E+00	}(	1.582E+00	5.24E-01	G
RA-226	2.8245E+00						
		185.99	2.824E+00	*(	1.529E+00	5.59E-01	G
AC-228	9.6316E-01						
		911.07	1.006E+00	(	2.464E-01	1.29E-01	G K
		968.90	1.532E+00	+	4.480E-01	2.34E-01	G
		338.40	8.600E-01	(	4.669E-01	1.80E-01	G

Yankee Chemistry Spectrum name: 101F_3JAN2005_1950.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-9.3893E-02						
		236.00	-9.389E-02	%(	4.909E-01	1.46E-01	G K
		256.25	-1.420E-02	%	7.388E-01	2.16E-01	G
PA-234	1.4425E-02						
		98.44	1.442E-02	%(	2.337E-01	6.94E-02	G K
		946.00	5.009E-02	&	3.339E-01	9.44E-02	G
		131.28	4.872E-03	&	2.388E-01	7.04E-02	G
		94.67	-8.991E-02	&	4.190E-01	1.26E-01	G
		883.24	1.547E-01	&	4.882E-01	1.43E-01	G
		926.70	6.371E-03	%	4.587E-01	1.21E-01	G
		569.26	-3.610E-02	%	6.095E-01	1.74E-01	G
TH-234	1.6184E+00						
		63.29	1.168E+00	%(	2.890E+00	8.73E-01	G K
		92.80	1.777E+00	(	2.090E+00	6.45E-01	G
		92.38	2.117E+00	(	2.483E+00	7.66E-01	G
AM-241	-6.3674E-02						
		59.54	-6.367E-02	&(P	3.841E-01	1.15E-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

Yankee Chemistry Spectrum name: 101F_3JAN2005_1950.An1

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	1.8793E-01	2.8224E-01	7.5489E-01	7.5506E-01	5.627E-01
K-40		1.6893E+01	1.6893E+01	2.2894E+00	2.4804E+00	
MN-54	#A	1.2727E-02	1.3644E-02	6.0541E-02	6.0546E-02	6.558E-02
CO-57	#B	1.1739E-02	1.2722E-02	6.2147E-02	6.2151E-02	6.404E-02
CO-60	#B	-8.4511E-04	-8.5470E-04	7.9367E-02	7.9367E-02	9.418E-02
Sr-85	#A	-2.6516E-02	-3.7066E-02	9.5858E-02	9.5881E-02	7.642E-02
Kr-85	#A	-6.1213E+02	-6.1227E+02	1.5834E+03	1.5838E+03	1.764E+03
Y-88	#B	-1.1268E-03	-1.3814E-03	8.2883E-03	8.2887E-03	3.367E-02
NB-94	#B	3.4506E-03	3.4506E-03	4.6416E-02	4.6417E-02	5.647E-02
Ag-108M	#B	-1.7152E-02	-1.7160E-02	7.1503E-02	7.1510E-02	8.180E-02
CD-109	#A	1.7317E-01	1.8167E-01	1.8548E+00	1.8548E+00	1.975E+00
SN-113	#B	-1.1853E-02	-1.4314E-02	1.2728E-01	1.2728E-01	8.545E-02
SB-125	#B	1.2892E-01	1.3172E-01	1.1483E-01	1.1507E-01	1.758E-01
I-131	#B	8.3007E-03	1.2368E-01	6.9389E-01	6.9392E-01	5.345E-02
CS-134	#B	2.5502E-02	2.6248E-02	2.5486E-02	2.5529E-02	1.778E-01
CS-137		2.6918E-01	2.6971E-01	1.3688E-01	1.3772E-01	
CE-139	#A	1.3236E-02	1.5501E-02	6.9875E-02	6.9881E-02	6.665E-02
EU-152	#B	2.8898E-02	2.9034E-02	1.6881E-01	1.6882E-01	1.878E-01
EU-154	#B	2.7890E-02	2.8086E-02	1.1972E-01	1.1973E-01	1.325E-01
EU-155	#A	1.8982E-01	1.9211E-01	2.0559E-01	2.0587E-01	2.197E-01
HG-203	#B	3.4350E-02	5.4749E-02	8.1484E-02	8.1543E-02	5.595E-02
TL-208	#	3.9764E-01	3.9764E-01	1.3044E-01	1.3236E-01	
PB-212		1.0540E+00	1.0540E+00	1.4701E-01	1.5862E-01	
PB-214		8.6776E-01	8.6776E-01	1.8904E-01	1.9529E-01	
BI-212		6.7599E-01	6.7599E-01	5.4369E-01	5.4503E-01	
BI-214		8.3357E-01	8.3357E-01	2.1554E-01	2.2062E-01	
RA-224	A	1.4046E+00	1.4046E+00	1.5415E+00	1.5435E+00	
RA-226	#	2.8244E+00	2.8245E+00	1.6780E+00	1.6856E+00	
AC-228		9.6316E-01	9.6316E-01	3.5436E-01	3.5852E-01	
TH-227	#B	-9.3893E-02	-9.3893E-02	4.3773E-01	4.3776E-01	4.909E-01
PA-234	#B	1.4425E-02	1.4425E-02	2.0819E-01	2.0819E-01	2.337E-01
TH-234	#B	1.6184E+00	1.6184E+00	1.4670E+00	1.4697E+00	2.890E+00
AM-241	#A	-6.3666E-02	-6.3674E-02	3.5376E-01	3.5378E-01	3.840E-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

Yankee Chemistry Spectrum name: 101F_3JAN2005_1950.An1

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

Total Activity (295.1 to 1999.1 keV) 2.6183075E+01 pCi/gm
Total Decayed Activity (295.1 to 1999.1 keV) 2.6183712E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_4JAN2004_1550.An1

Sample description
FSS-OOL-04-01-003-F SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_4JAN2004_1550.An1

Acquisition information
Start time: 04-Jan-2005 15:43:42
Live time: 2000
Real time: 2003
Dead time: 0.14 %
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: 1.4580E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4580E+03) =
6.8587E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_4JAN2004_1550.An1

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	06-Dec-2004 11:51:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2314

***** 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
74.29	134.	22.35	1.00	1.651E-02				
74.29	134.	22.35	1.00	1.651E-02	74.81	9.600	7.803E-01	PB212
77.22	321.	9.16	1.01	1.734E-02	77.11	17.500	9.877E-01	PB212
					77.11	10.700	1.615E+00	PB214
87.08	99.	39.11	1.50	1.910E-02	86.45	32.740	PBC<MDA	EU155
89.56	81.	30.81	1.02	1.952E-02	88.04	3.790	1.066E+00	CD109
93.16	129.	19.60	1.02	1.993E-02	92.38	2.570	2.340E+00	TH234
					92.80	3.000	2.000E+00	TH234
186.10	96.	32.28	1.16	1.858E-02	185.99	3.280	1.467E+00	RA226
209.16	63.	38.96	0.85	1.722E-02				
238.68	634.	4.61	1.12	1.557E-02				
238.68	634.	4.61	1.12	1.557E-02	238.63	43.100	8.754E-01	PB212
241.57	114.	18.75	1.12	1.542E-02	241.00	3.900	1.752E+00	RA224
295.16	186.	10.97	1.11	1.292E-02				
295.16	186.	10.97	1.11	1.292E-02	295.22	19.200	6.964E-01	PB214
300.16	56.	30.79	0.69	1.272E-02				
338.21	108.	21.23	1.05	1.136E-02	338.40	12.010	7.310E-01	AC228
351.85	306.	10.04	1.37	1.093E-02				
351.85	306.	10.04	1.37	1.093E-02	351.99	37.100	7.002E-01	PB214
510.79	94.	21.13	1.38	7.589E-03	510.72	22.500	5.112E-01	TL208
583.20	165.	11.61	1.38	6.684E-03	583.14	86.000	2.659E-01	TL208
609.04	239.	10.85	1.58	6.415E-03	609.32	46.090	7.482E-01	BI214
661.36	67.	25.19	0.96	5.940E-03	661.62	84.620	1.244E-01	CS137
726.36	52.	35.17	1.03	5.448E-03				
726.36	52.	35.17	1.03	5.448E-03	727.17	11.800	7.562E-01	BI212
910.93	106.	12.01	1.74	4.447E-03	911.07	29.000	7.641E-01	AC228

968.63	64.	16.49	1.67	4.213E-03	968.90	17.460	8.091E-01	AC228
1119.94	77.	22.11	1.57	3.712E-03	1120.28	15.040	1.279E+00	BI214
1460.22	500.	4.53	1.90	2.943E-03	1460.75	10.700	1.472E+01	K40
1763.54	36.	16.67	1.28	2.481E-03	1764.51	15.920	8.447E-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	
148.14	74.72	379.	134.	0.067	67.04	1.004	BI-207	D
154.00	77.64	271.	321.	0.160	27.47	1.007	PB-214	D
178.70	89.52	267.	81.	0.040	92.42	1.015	PB-214	lD
417.98	209.16	231.	63.	0.031	116.88	0.855	AC-228	
477.06	238.62	110.	634.	0.317	13.84	1.122	PB-212	D
600.07	300.16	107.	56.	0.028	87.34	0.692	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	148.89	74.66	772.	149.	0.075	82.61	1.499
PB-212	153.79	77.11	750.	246.	0.123	50.93	1.499D
PB-214	153.79	77.11	750.	246.	0.123	50.93	1.499D
EU-155	173.74	87.08	703.	99.	0.050	117.33	1.499s
TH-234	185.80	93.11	664.	145.	0.072	79.44	1.499s
TH-234	185.76	93.09	646.	145.	0.072	78.57	1.499s
RA-226	371.82	186.08	391.	89.	0.045	99.42	1.499s
PB-212	476.96	238.63	369.	452.	0.226	22.89	1.499D
RA-224	481.70	241.00	347.	83.	0.042	100.34	1.123D
PB-214	590.09	295.17	121.	172.	0.086	35.43	1.499s
AC-228	676.19	338.20	137.	104.	0.052	63.55	1.052
PB-214	703.47	351.84	111.	251.	0.126	25.97	1.499
TL-208	1021.52	510.79	89.	94.	0.047	63.38	1.376s
TL-208	1166.40	583.20	65.	165.	0.082	34.84	1.377
BI-214	1218.11	609.04	105.	239.	0.119	32.56	1.576s
CS-137	1322.82	661.36	67.	67.	0.034	75.57	0.957s
BI-212	1453.88	726.86	39.	36.	0.018	90.15	1.499
AC-228	1822.22	910.93	25.	106.	0.053	36.04	1.743
AC-228	1937.67	968.63	21.	64.	0.032	49.46	1.671
BI-214	2240.46	1119.94	56.	77.	0.038	66.33	1.566
K-40	2921.45	1460.22	3.	500.	0.250	13.59	1.896
BI-214	3528.52	1763.54	0.	36.	0.018	50.00	1.285s

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		7.4248E-02						
			477.56	7.425E-02	&(	6.109E-01	1.76E-01	G
K-40		1.4716E+01						
			1460.75	1.472E+01	(	3.213E-01	6.66E-01	G
MN-54		1.6747E-02						
			834.81	1.675E-02	&(	6.065E-02	1.77E-02	G
CO-57		-1.4217E-03						
			122.07	-1.422E-03	&(P	5.664E-02	1.67E-02	G K
			136.43	1.408E-02	&	5.042E-01	1.50E-01	G
CO-60		2.5603E-02						
			1332.51	2.560E-02	%(P	7.373E-02	2.04E-02	G K
			1173.23	-3.008E-04	% P	8.154E-02	2.15E-02	G K
Sr-85		-3.7079E-02						
			514.00	-3.708E-02	%(	9.443E-02	2.84E-02	G
Kr-85		-6.2693E+02						
			513.99	-6.269E+02	%(	1.596E+03	4.80E+02	G
Y-88		-1.1630E-03						
			1836.01	-1.163E-03	%(P	7.906E-02	1.98E-02	G K
			898.02	-6.641E-03	& P	7.884E-02	2.18E-02	G
NB-94		1.0247E-02						
			871.10	1.025E-02	%(	4.608E-02	1.31E-02	G K
			702.50	0.000E+00	&	6.413E-02	1.81E-02	G K
Ag-108M		-1.1910E-02						
			722.95	-1.191E-02	&(	6.705E-02	1.94E-02	G K
			614.37	-3.626E-04	%	7.170E-02	2.04E-02	G
			433.93	8.221E-03	&	5.184E-02	1.51E-02	G
CD-109		3.1918E-01						
			88.04	3.192E-01	&(	1.696E+00	5.08E-01	G
SN-113		-1.0543E-02						
			391.71	-1.054E-02	&(P	9.542E-02	2.77E-02	G K
			255.04	7.085E-04	%	2.480E+00	7.23E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	5.1378E-02						
		427.95	5.138E-02	%(	1.398E-01	4.17E-02	G K
		600.77	-5.614E-02	%	3.007E-01	8.73E-02	G
		636.15	3.573E-02	%	4.037E-01	1.13E-01	G
		463.51	-2.413E-02	&	5.806E-01	1.68E-01	G
		176.29	-1.497E-01	%	7.539E-01	2.25E-01	G
I-131	0.0000E+00						
		364.48	0.000E+00	&(	6.884E-01	1.98E-01	G K
		636.97	2.347E+00	%	7.433E+00	2.19E+00	G
		284.29	6.946E-02	&	6.635E+00	1.90E+00	G
CS-134	-1.0591E-02						
		604.66	-1.059E-02	%(	7.413E-02	2.16E-02	G K
		795.76	-4.217E-03	%	6.949E-02	1.95E-02	G
		569.29	3.454E-02	&	3.821E-01	1.10E-01	G
		801.84	1.353E-01	%	5.419E-01	1.56E-01	G
CS-137	1.2438E-01						
		661.62	1.244E-01	@(	7.535E-02	3.13E-02	G
CE-139	2.0835E-03						
		165.85	2.083E-03	&(P	6.280E-02	1.85E-02	G
EU-152	-9.8972E-03						
		121.78	-9.897E-03	&(	1.703E-01	5.06E-02	G K
		344.30	-1.384E-03	%	1.778E-01	5.15E-02	G
		1408.08	8.839E-02	%	2.307E-01	6.82E-02	G
		964.00	-6.403E-04	%	5.496E-01	1.54E-01	G
		1112.07	-1.664E-01	%	7.265E-01	2.13E-01	G
		778.90	-8.072E-02	%	4.705E-01	1.35E-01	G
EU-154	1.9573E-02						
		123.10	1.957E-02	&(	1.164E-01	3.47E-02	G K
		1274.80	0.000E+00	%	2.745E-01	7.68E-02	G
		723.30	5.487E-02	&	3.264E-01	9.45E-02	G
		1004.80	7.340E-02	&	3.816E-01	1.10E-01	G
EU-155	1.4876E-01						
		86.45	1.488E-01	&(	1.894E-01	5.82E-02	G K
		105.31	9.492E-02	&	2.287E-01	6.91E-02	G
HG-203	-1.5863E-02						
		279.17	-1.586E-02	%(P	8.706E-02	2.53E-02	G K
		72.87	-6.055E-01	%	2.076E+00	6.25E-01	G
		70.83	-1.032E+00	%	3.806E+00	1.15E+00	G
		82.50	-1.691E+00	%	4.476E+00	1.35E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.6587E-01						
		583.14	2.659E-01	(	6.499E-02	3.09E-02	G
		510.72	5.112E-01	+	2.530E-01	1.08E-01	G
PB-212	6.6274E-01						
							Energy duplication
		238.63	6.242E-01	(	1.273E-01	4.76E-02	G K
							Energy duplication
		77.11	7.576E-01	(	4.012E-01	1.29E-01	G
		74.81	8.725E-01	&	7.718E-01	2.40E-01	G
PB-214	5.9823E-01						
		351.99	5.746E-01	(	1.184E-01	4.97E-02	G K
		295.22	6.439E-01	@(	2.016E-01	7.60E-02	G
							Energy duplication
		77.11	1.239E+00	+	6.561E-01	2.10E-01	G
		241.92	-1.891E-01	%	8.211E-01	2.46E-01	G
BI-212	5.1369E-01						
		727.17	5.137E-01	(	4.613E-01	1.54E-01	G K
		1620.56	1.822E-01	%	1.290E+00	3.25E-01	G
		785.42	8.240E-01	&	2.551E+00	7.51E-01	G
BI-214	7.7299E-01						
		609.32	7.482E-01	@(	1.585E-01	8.12E-02	G K
		1764.51	8.447E-01	(	1.729E-01	1.41E-01	G
		1120.28	1.279E+00	+	6.241E-01	2.83E-01	G
RA-224	1.2818E+00						
		241.00	1.282E+00	(	1.376E+00	4.29E-01	G
RA-226	1.3535E+00						
		185.99	1.354E+00	*(	1.442E+00	4.49E-01	G
AC-228	7.6610E-01						
		911.07	7.641E-01	(	1.859E-01	9.18E-02	G K
		968.90	8.091E-01	(	3.020E-01	1.33E-01	G
		338.40	7.085E-01	(	3.890E-01	1.50E-01	G
TH-227	-9.4288E-02						
		236.00	-9.429E-02	%(	5.487E-01	1.64E-01	G K
		256.25	1.979E-02	%	6.428E-01	1.88E-01	G
PA-234	-1.2373E-02						
		98.44	-1.237E-02	%(	2.005E-01	5.96E-02	G K
		946.00	-3.669E-02	%	3.227E-01	9.13E-02	G
		131.28	-1.037E-02	&	1.923E-01	5.68E-02	G
		94.67	-6.629E-02	%	3.746E-01	1.12E-01	G
		883.24	-9.105E-02	%	5.581E-01	1.60E-01	G
		926.70	1.548E-01	%	6.016E-01	1.75E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 4.909E-02 &   5.521E-01 1.59E-01 G

TH-234       1.8510E+00
                           63.29 1.031E+00 %(  2.427E+00 7.34E-01 G K
                           92.80 2.247E+00 *(  1.881E+00 5.89E-01 G
                           92.38 2.633E+00 *(  2.230E+00 6.97E-01 G

AM-241       8.7695E-03
                           59.54 8.769E-03 %(P 3.543E-01 1.05E-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	5.0850E-02	7.4248E-02	5.2659E-01	5.2660E-01	4.184E-01
K-40		1.4716E+01	1.4716E+01	1.9995E+00	2.1655E+00	
MN-54	#A	1.5697E-02	1.6747E-02	5.3141E-02	5.3149E-02	5.684E-02
CO-57	#B	-1.3192E-03	-1.4217E-03	1.5554E-01	1.5554E-01	5.255E-02
CO-60	#B	2.5336E-02	2.5603E-02	6.1319E-02	6.1336E-02	7.296E-02

Sr-85	#A	-2.7148E-02	-3.7079E-02	8.5180E-02	8.5206E-02	6.914E-02
Kr-85	#A	-6.2679E+02	-6.2693E+02	1.4401E+03	1.4405E+03	1.596E+03
Y-88	#B	-9.6215E-04	-1.1630E-03	2.9364E-02	2.9364E-02	6.540E-02
NB-94	#B	1.0247E-02	1.0247E-02	3.9427E-02	3.9432E-02	4.608E-02
Ag-108M	#B	-1.1904E-02	-1.1910E-02	5.8180E-02	5.8183E-02	6.702E-02
CD-109	#A	3.0526E-01	3.1918E-01	1.5236E+00	1.5237E+00	1.622E+00
SN-113	#B	-8.8450E-03	-1.0543E-02	1.2423E-01	1.2423E-01	8.005E-02
SB-125	#B	5.0361E-02	5.1378E-02	1.2522E-01	1.2526E-01	1.370E-01
I-131	#B	0.0000E+00	0.0000E+00	5.9382E-01	5.9382E-01	5.572E-02
CS-134	#B	-1.0311E-02	-1.0591E-02	6.4881E-02	6.4884E-02	7.216E-02
CS-137	#	1.2415E-01	1.2438E-01	9.3996E-02	9.4258E-02	
CE-139	#A	1.7986E-03	2.0835E-03	5.5604E-02	5.5604E-02	5.421E-02
EU-152	#B	-9.8542E-03	-9.8972E-03	1.5180E-01	1.5180E-01	1.696E-01
EU-154	#B	1.9446E-02	1.9573E-02	1.0421E-01	1.0421E-01	1.156E-01
EU-155	#A	1.4711E-01	1.4876E-01	1.7454E-01	1.7474E-01	1.873E-01
HG-203	#B	-1.0280E-02	-1.5863E-02	1.8325E-01	1.8325E-01	5.642E-02
TL-208		2.6587E-01	2.6587E-01	9.2625E-02	9.3835E-02	
PB-212	#	6.6274E-01	6.6274E-01	1.5169E-01	1.5625E-01	1.273E-01
PB-214	#	5.9823E-01	5.9823E-01	1.3139E-01	1.3567E-01	1.184E-01
BI-212	#	5.1369E-01	5.1369E-01	4.6309E-01	4.6400E-01	4.613E-01
BI-214		7.7299E-01	7.7299E-01	2.3062E-01	2.3472E-01	
RA-224	A	1.2818E+00	1.2818E+00	1.2861E+00	1.2882E+00	
RA-226	#A	1.3535E+00	1.3535E+00	1.3457E+00	1.3479E+00	1.442E+00
AC-228		7.6610E-01	7.6610E-01	2.2531E-01	2.2943E-01	
TH-227	#B	-9.4288E-02	-9.4288E-02	4.9113E-01	4.9116E-01	5.487E-01
PA-234	#B	-1.2373E-02	-1.2373E-02	1.7867E-01	1.7867E-01	2.005E-01
TH-234	#B	1.8510E+00	1.8510E+00	1.4544E+00	1.4580E+00	2.427E+00
AM-241	#A	8.7684E-03	8.7695E-03	3.1557E-01	3.1557E-01	3.543E-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 (278.1 to 1999.1 keV) 1.7927200E+01 pCi/gm
Total Decayed Activity (278.1 to 1999.1 keV) 1.7927429E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_4JAN2004_1745.An1

Sample description
FSS-OOL-04-01-020-F SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_4JAN2004_1745.An1

Acquisition information
Start time: 04-Jan-2005 17:38:27
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: 9.0700E+02
Activity scaling factor: 1.0000E+06/(1.0000E+00* 9.0700E+02) =
1.1025E+03
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_4JAN2004_1745.An1

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	03-Dec-2004 14:10:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 20 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1985

***** 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	84.	34.54	1.50	8.545E-03	59.54	36.300	PBC<MDA	AM241
					63.29	3.900	2.864E+00	TH234
74.62	261.	11.88	1.00	1.651E-02				
74.62	261.	11.88	1.00	1.651E-02	74.81	9.600	2.450E+00	PB212
77.12	421.	7.98	1.01	1.723E-02	77.11	17.500	2.086E+00	PB212
					77.11	10.700	3.411E+00	PB214
86.95	140.	18.20	1.01	1.917E-02	86.45	32.740	3.379E-01	EU155
90.04	79.	29.74	1.02	1.958E-02				
93.25	144.	17.73	1.02	1.994E-02	92.38	2.570	4.213E+00	TH234
					92.80	3.000	3.601E+00	TH234
185.90	109.	27.24	1.00	1.859E-02				
185.90	109.	27.24	1.00	1.859E-02	185.99	3.280	2.665E+00	RA226
238.67	764.	4.09	1.12	1.557E-02	238.63	43.100	1.696E+00	PB212
269.97	55.	37.12	1.29	1.402E-02				
295.28	214.	12.30	1.32	1.292E-02	295.22	19.200	1.285E+00	PB214
300.24	48.	34.59	0.84	1.272E-02				
327.53	48.	37.33	1.25	1.171E-02				
338.41	158.	15.30	1.17	1.135E-02	338.40	12.010	1.722E+00	AC228
351.87	344.	7.52	1.24	1.093E-02				
351.87	344.	7.52	1.24	1.093E-02	351.99	37.100	1.264E+00	PB214
462.93	46.	29.22	1.17	8.352E-03				
462.93	46.	29.22	1.17	8.352E-03	463.51	10.000	8.308E-01	SB125
510.43	124.	15.35	0.85	7.595E-03	510.72	22.500	1.084E+00	TL208
582.92	206.	10.40	1.53	6.687E-03	583.14	86.000	5.334E-01	TL208
609.09	243.	7.97	1.17	6.415E-03	609.32	46.090	1.225E+00	BI214
661.33	60.	23.27	1.23	5.940E-03	661.62	84.620	1.798E-01	CS137

727.23	50.	28.93	0.70	5.443E-03	727.17	11.800	1.151E+00	BI212
795.13	32.	24.26	1.52	5.020E-03				
795.13	32.	24.26	1.52	5.020E-03	795.76	85.400	1.139E-01	CS134
911.00	143.	11.19	1.73	4.447E-03	911.07	29.000	1.650E+00	AC228
968.66	48.	24.76	1.62	4.212E-03	968.90	17.460	9.755E-01	AC228
1118.89	68.	22.59	1.62	3.711E-03	1120.28	15.040	1.815E+00	BI214
1460.40	424.	5.05	1.99	2.943E-03	1460.75	10.700	2.006E+01	K40
1764.04	36.	17.74	2.03	2.481E-03	1764.51	15.920	1.365E+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	
148.81	74.72	351.	261.	0.131	35.65	1.005	BI-207	D
153.81	77.22	356.	421.	0.211	23.95	1.006	PB-214	D
179.65	90.03	240.	79.	0.040	89.23	1.016	PB-214	lD
477.06	238.66	106.	764.	0.382	12.27	1.122	PB-212	D
484.01	242.14	153.	124.	0.062	50.39	1.124	PB-214	lD
539.67	269.97	148.	55.	0.027	111.36	1.293	AC-228	
600.23	300.24	109.	48.	0.024	103.77	0.837	PB-212	
654.84	327.53	115.	48.	0.024	111.98	1.252	AC-228	
925.76	462.93	65.	33.	0.016	117.37	1.170	AC-228	s
1934.83	967.21	27.	105.	0.052	41.70	1.175	SB-124	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
AM-241	125.69	63.07	381.	84.	0.042	103.62	1.499
PB-212	149.11	74.77	868.	213.	0.106	62.32	1.499
PB-212	153.79	77.11	753.	321.	0.160	39.97	1.499D
PB-214	153.79	77.11	753.	321.	0.160	39.97	1.499D
EU-155	173.68	87.05	721.	139.	0.069	85.88	1.499
TH-234	185.60	93.01	645.	170.	0.085	67.62	1.499s
TH-234	185.57	93.00	616.	172.	0.086	65.46	1.499s
RA-226	371.99	186.17	337.	107.	0.054	78.10	1.499
PB-212	476.99	238.64	281.	574.	0.287	17.61	1.499
RA-224	481.70	241.00	382.	93.	0.047	93.99	1.123D
PB-214	590.28	295.27	161.	211.	0.106	32.77	1.499
AC-228	676.60	338.41	136.	158.	0.079	45.90	1.173
PB-214	703.60	351.90	84.	321.	0.160	20.70	1.499
TL-208	1020.79	510.43	75.	124.	0.062	46.06	0.855s
TL-208	1165.86	582.92	70.	206.	0.103	31.21	1.533s
BI-214	1218.22	609.09	44.	243.	0.122	23.91	1.167
CS-137	1322.74	661.33	48.	60.	0.030	69.82	1.228
BI-212	1454.62	727.23	50.	50.	0.025	86.78	0.703s
CS-134	1590.05	794.91	15.	33.	0.016	72.98	1.502
AC-228	1822.35	911.00	31.	143.	0.071	33.56	1.728s

Yankee Chemistry Spectrum name: 101F_4JAN2004_1745.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1937.73	968.66	47.	48.	0.024	74.27	1.616s
BI-214	2238.36	1118.89	42.	68.	0.034	67.77	1.624s
K-40	2921.81	1460.40	10.	424.	0.212	15.16	1.987
BI-214	3529.52	1764.04	2.	36.	0.018	53.22	2.033

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

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

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		2.7847E-01					
			477.56	2.785E-01	%(	1.068E+00 3.14E-01	G
K-40		2.0065E+01					
			1460.75	2.006E+01	(	8.256E-01 1.01E+00	G
MN-54		2.2443E-02					
			834.81	2.244E-02	%(	8.369E-02 2.43E-02	G
CO-57		-1.6984E-02					
			122.07	-1.698E-02	%(P	1.000E-01 2.98E-02	G K
			136.43	1.322E-01	%	7.773E-01 2.32E-01	G
CO-60		-1.9364E-02					
			1332.51	-1.936E-02	%(P	1.275E-01 3.12E-02	G K
			1173.23	-1.237E-03	% P	1.338E-01 3.53E-02	G K
Sr-85		-5.8293E-02					
			514.00	-5.829E-02	&(	1.486E-01 4.47E-02	G
Kr-85		-9.5460E+02					
			513.99	-9.546E+02	&(	2.434E+03 7.31E+02	G
Y-88		-1.4107E-02					
			1836.01	-1.411E-02	%(P	1.134E-01 2.92E-02	G K
			898.02	-1.450E-02	% P	1.212E-01 3.35E-02	G
NB-94		-2.4137E-03					
			871.10	-2.414E-03	%(	7.351E-02 1.99E-02	G K
			702.50	-2.391E-05	&	7.770E-02 2.14E-02	G K
Ag-108M		3.2042E-03					
			722.95	3.204E-03	&(	1.949E-01 5.68E-02	G K
			614.37	-2.829E-02	%	9.810E-02 2.89E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		433.93	-2.108E-04	%	7.249E-02	2.05E-02	G
CD-109	-2.7296E-01						
		88.04	-2.730E-01	%(	3.090E+00	9.23E-01	G
SN-113	4.9517E-03						
		391.71	4.952E-03	%(P	1.412E-01	4.05E-02	G K
		255.04	-2.049E-01	&	4.314E+00	1.27E+00	G
SB-125	-1.8377E-02						
		427.95	-1.838E-02	%(	2.499E-01	7.19E-02	G K
		600.77	7.354E-02	%	4.139E-01	1.19E-01	G
		636.15	1.633E-01	%	6.151E-01	1.79E-01	G
		463.51	2.343E-01	%	7.380E-01	2.19E-01	G
		176.29	-3.450E-01	%	1.151E+00	3.45E-01	G
I-131	4.9216E-02						
		364.48	4.922E-02	&(	1.556E+00	4.51E-01	G K
		636.97	-1.937E+00	&	1.710E+01	4.86E+00	G
		284.29	0.000E+00	%	2.061E+01	6.01E+00	G
CS-134	4.5219E-02						
		604.66	-1.789E-02	%(	9.651E-02	2.81E-02	G K
		795.76	1.173E-01	(	7.516E-02	2.85E-02	G
		569.29	2.573E-01	&	4.787E-01	1.47E-01	G
		801.84	-9.272E-03	&	1.008E+00	2.77E-01	G
CS-137	1.7977E-01						
		661.62	1.798E-01	(	1.035E-01	4.18E-02	G
CE-139	1.0980E-02						
		165.85	1.098E-02	%(P	1.038E-01	3.08E-02	G
EU-152	-3.6564E-02						
		121.78	-3.656E-02	%(	2.685E-01	8.00E-02	G K
		344.30	-1.605E-02	%	2.763E-01	8.03E-02	G
		1408.08	1.112E-01	%	4.415E-01	1.26E-01	G
		964.00	-9.790E-02	&	9.302E-01	2.67E-01	G
		1112.07	-1.713E-01	%	8.259E-01	2.37E-01	G
		778.90	-3.633E-03	&	7.471E-01	2.08E-01	G
EU-154	3.1885E-03						
		123.10	3.188E-03	%(	1.810E-01	5.35E-02	G K
		1274.80	-3.905E-02	%	3.085E-01	8.61E-02	G
		723.30	-1.496E-01	&	6.225E-01	1.83E-01	G
		1004.80	-9.262E-02	%	5.767E-01	1.64E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	3.3503E-01						
		86.45	3.350E-01	(	3.084E-01	9.59E-02	G K
		105.31	7.082E-03	%	3.719E-01	1.10E-01	G
HG-203	2.4616E-02						
		279.17	2.462E-02	%(P	1.354E-01	3.97E-02	G K
		72.87	-2.084E+00	%	3.860E+00	1.17E+00	G
		70.83	-4.008E-01	&	5.344E+00	1.59E+00	G
		82.50	6.126E-01	%	6.569E+00	1.95E+00	G
TL-208	5.3338E-01						
		583.14	5.334E-01	@(	1.082E-01	5.55E-02	G
		510.72	1.084E+00	+	3.752E-01	1.66E-01	G
PB-212	1.2746E+00						
		238.63	1.275E+00	(	1.794E-01	7.48E-02	G K
							Energy duplication
		77.11	1.587E+00	+	6.460E-01	2.11E-01	G
		74.81	1.994E+00	&	1.314E+00	4.14E-01	G
PB-214	1.2097E+00						
		351.99	1.179E+00	(	1.673E-01	8.13E-02	G K
		295.22	1.269E+00	(	3.712E-01	1.39E-01	G
							Energy duplication
		77.11	2.596E+00	+	1.057E+00	3.46E-01	G
		241.92	-5.811E-01	%	1.479E+00	4.47E-01	G
BI-212	1.1506E+00						
		727.17	1.151E+00	(	8.303E-01	3.33E-01	G K
		1620.56	4.363E-01	&	2.579E+00	6.84E-01	G
		785.42	2.466E+00	%	4.325E+00	1.34E+00	G
BI-214	1.2610E+00						
		609.32	1.225E+00	(	1.695E-01	9.76E-02	G K
		1764.51	1.365E+00	(	3.380E-01	2.42E-01	G
		1120.28	1.815E+00	+	8.786E-01	4.10E-01	G
RA-224	2.3100E+00						
		241.00	2.310E+00	(	2.318E+00	7.24E-01	G
RA-226	2.6257E+00						
		185.99	2.626E+00	(	2.158E+00	6.84E-01	G
AC-228	1.6709E+00						
		911.07	1.650E+00	@(	3.321E-01	1.85E-01	G K
		968.90	9.755E-01	&	7.019E-01	2.41E-01	G
		338.40	1.722E+00	(	6.247E-01	2.63E-01	G

Yankee Chemistry Spectrum name: 101F_4JAN2004_1745.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-1.7963E-01						
		236.00	-1.796E-01	%(	6.655E-01	1.99E-01	G K
		256.25	7.742E-03	&	9.265E-01	2.69E-01	G
PA-234	1.4094E-02						
		98.44	1.409E-02	%(	3.109E-01	9.22E-02	G K
		946.00	-3.733E-02	%	4.654E-01	1.30E-01	G
		131.28	1.236E-01	&	3.411E-01	1.03E-01	G
		94.67	-1.803E-01	&	6.074E-01	1.83E-01	G
		883.24	-5.021E-02	&	6.905E-01	1.91E-01	G
		926.70	-1.766E-01	%	9.356E-01	2.69E-01	G
		569.26	3.708E-01	&	6.894E-01	2.11E-01	G
TH-234	3.6167E+00						
		63.29	2.220E+00	%(	3.876E+00	1.18E+00	G K
		92.80	4.288E+00	(	2.956E+00	9.36E-01	G
		92.38	4.952E+00	(	3.537E+00	1.12E+00	G
AM-241	4.0319E-01						
		59.54	4.032E-01	&(P	4.499E-01	1.40E-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

Yankee Chemistry Spectrum name: 101F_4JAN2004_1745.An1

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	1.8347E-01	2.7847E-01	9.4202E-01	9.4215E-01	7.035E-01
K-40		2.0065E+01	2.0065E+01	3.0415E+00	3.2460E+00	
MN-54	#A	2.0897E-02	2.2443E-02	7.2756E-02	7.2767E-02	7.792E-02
CO-57	#B	-1.5638E-02	-1.6984E-02	1.0285E-01	1.0285E-01	9.212E-02
CO-60	#B	-1.9141E-02	-1.9364E-02	4.1686E-01	4.1686E-01	1.260E-01
Sr-85	#A	-4.1341E-02	-5.8293E-02	1.3398E-01	1.3402E-01	1.054E-01
Kr-85	#A	-9.5437E+02	-9.5460E+02	2.1941E+03	2.1948E+03	2.433E+03
Y-88	#B	-1.1446E-02	-1.4107E-02	1.1490E-01	1.1490E-01	9.199E-02
NB-94	#B	-2.4137E-03	-2.4137E-03	5.9574E-02	5.9574E-02	7.351E-02
Ag-108M	#B	3.2026E-03	3.2042E-03	1.7027E-01	1.7027E-01	1.948E-01
CD-109	#A	-2.5986E-01	-2.7296E-01	2.7698E+00	2.7698E+00	2.942E+00
SN-113	#B	4.0802E-03	4.9517E-03	1.2162E-01	1.2162E-01	1.163E-01
SB-125	#B	-1.7976E-02	-1.8377E-02	2.1560E-01	2.1560E-01	2.444E-01
I-131	#B	3.0800E-03	4.9216E-02	1.3524E+00	1.3524E+00	9.736E-02
CS-134	#B	4.3900E-02	4.5219E-02	3.3001E-02	3.3100E-02	9.369E-02
CS-137		1.7941E-01	1.7977E-01	1.2551E-01	1.2593E-01	
CE-139	#A	9.3377E-03	1.0980E-02	9.2390E-02	9.2392E-02	8.831E-02
EU-152	#B	-3.6389E-02	-3.6564E-02	2.4011E-01	2.4012E-01	2.672E-01
EU-154	#B	3.1657E-03	3.1885E-03	1.6065E-01	1.6065E-01	1.797E-01
EU-155	#	3.3093E-01	3.3503E-01	2.8772E-01	2.8832E-01	3.046E-01
HG-203	#B	1.5259E-02	2.4616E-02	1.1906E-01	1.1907E-01	8.395E-02
TL-208	#	5.3338E-01	5.3338E-01	1.6649E-01	1.6920E-01	
PB-212	#	1.2746E+00	1.2746E+00	2.2448E-01	2.3575E-01	1.794E-01
PB-214	#	1.2097E+00	1.2097E+00	2.3445E-01	2.4421E-01	1.673E-01
BI-212		1.1506E+00	1.1506E+00	9.9846E-01	1.0006E+00	
BI-214		1.2610E+00	1.2610E+00	3.0147E-01	3.0978E-01	
RA-224	A	2.3100E+00	2.3100E+00	2.1712E+00	2.1751E+00	
RA-226	#	2.6256E+00	2.6257E+00	2.0507E+00	2.0560E+00	2.158E+00
AC-228		1.6709E+00	1.6709E+00	4.7501E-01	4.8430E-01	
TH-227	#B	-1.7963E-01	-1.7963E-01	5.9657E-01	5.9666E-01	6.655E-01
PA-234	#B	1.4094E-02	1.4094E-02	2.7657E-01	2.7657E-01	3.109E-01
TH-234	#B	3.6167E+00	3.6167E+00	2.2328E+00	2.2417E+00	3.876E+00
AM-241	#A	4.0314E-01	4.0319E-01	4.1907E-01	4.1966E-01	4.499E-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

Yankee Chemistry Spectrum name: 101F_4JAN2004_1745.An1

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

Total Activity (269.6 to 1999.1 keV) 2.7169950E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 2.7170313E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_4JAN2005_1515.An1

Sample description
FSS-OOL-04-01-008-F SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_4JAN2005_1515.An1

Acquisition information
Start time: 04-Jan-2005 15:07:31
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: 1.0190E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.0190E+03) =
9.8135E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_4JAN2005_1515.An1

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	03-Dec-2004 13:38:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 19 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.3052

***** 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	273.	15.14	1.50	1.654E-02				
74.81	273.	15.14	1.50	1.654E-02	74.81	9.600	2.282E+00	PB212
77.03	300.	13.82	1.50	1.720E-02	77.11	10.700	2.163E+00	PB214
					77.11	17.500	1.322E+00	PB212
77.03	300.	13.82	1.50	1.720E-02	77.11	10.700	2.163E+00	PB214
					77.11	17.500	1.322E+00	PB212
87.15	111.	21.31	1.01	1.924E-02	86.45	32.740	2.386E-01	EU155
89.59	81.	27.93	1.02	1.956E-02				
93.23	124.	19.58	1.02	1.997E-02	92.38	2.570	3.219E+00	TH234
					92.80	3.000	2.752E+00	TH234
129.09	75.	37.06	1.14	2.110E-02				
186.51	102.	26.45	1.05	1.855E-02	185.99	3.280	2.224E+00	RA226
209.04	65.	31.57	0.92	1.723E-02				
238.66	650.	4.55	1.12	1.558E-02				
238.66	650.	4.55	1.12	1.558E-02	238.63	43.100	1.284E+00	PB212
241.58	124.	17.00	1.12	1.542E-02	241.00	3.900	2.734E+00	RA224
295.30	206.	10.43	0.90	1.292E-02	295.22	19.200	1.099E+00	PB214
300.42	43.	38.61	0.71	1.271E-02				
337.99	156.	15.88	1.17	1.136E-02	338.40	12.010	1.518E+00	AC228
351.71	355.	7.93	1.02	1.093E-02				
351.71	355.	7.93	1.02	1.093E-02	351.99	37.100	1.162E+00	PB214
511.08	99.	17.04	1.43	7.585E-03	510.72	22.500	7.718E-01	TL208
583.06	197.	9.86	1.29	6.685E-03	583.14	86.000	4.545E-01	TL208
609.05	251.	9.15	1.46	6.415E-03	609.32	46.090	1.127E+00	BI214
661.24	108.	16.33	0.91	5.941E-03	661.62	84.620	2.862E-01	CS137
727.07	41.	30.81	1.17	5.444E-03	727.17	11.800	8.383E-01	BI212

794.90	26.	30.06	1.50	5.016E-03	795.76	85.400	8.331E-02	CS134
910.51	100.	13.04	1.18	4.449E-03	911.07	29.000	1.023E+00	AC228
968.12	112.	14.41	1.82	4.215E-03	968.90	17.460	2.027E+00	AC228
1121.92	74.	19.72	2.15	3.711E-03	1120.28	15.040	1.763E+00	BI214
1460.27	474.	4.75	1.83	2.943E-03	1460.75	10.700	1.996E+01	K40
1763.97	32.	17.68	1.52	2.481E-03	1764.51	15.920	1.074E+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	
173.87	87.42	225.	111.	0.056	63.93	1.014	PB-214	lD
178.76	89.86	214.	81.	0.040	83.79	1.015	PB-214	lD
417.76	209.04	178.	65.	0.032	94.70	0.923	AC-228	
477.02	238.60	112.	650.	0.325	13.65	1.122	PB-212	D
600.60	300.42	103.	43.	0.022	115.83	0.710	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	149.19	74.81	719.	273.	0.137	45.42	1.499
PB-214	153.79	77.11	710.	300.	0.150	41.46	1.499D
PB-212	153.79	77.11	710.	300.	0.150	41.46	1.499D
TH-234	185.58	93.00	574.	139.	0.069	77.69	1.499s
TH-234	185.53	92.98	547.	142.	0.071	74.51	1.499s
RA-226	372.15	186.25	317.	106.	0.053	77.02	1.499s
PB-212	476.94	238.62	310.	534.	0.267	19.08	1.499
RA-224	481.70	241.00	337.	101.	0.050	82.87	1.123D
PB-214	590.33	295.29	138.	184.	0.092	34.99	1.499
AC-228	675.77	337.99	143.	156.	0.078	47.64	1.175s
PB-214	703.32	351.76	120.	285.	0.143	24.12	1.499
TL-208	1022.10	511.08	65.	99.	0.050	51.11	1.426s
TL-208	1166.13	583.06	60.	197.	0.098	29.57	1.289s
BI-214	1218.14	609.05	73.	251.	0.126	27.44	1.461s
CS-137	1322.56	661.24	64.	108.	0.054	49.00	0.907s
BI-212	1454.30	727.07	41.	41.	0.020	92.44	1.168
CS-134	1590.02	794.90	18.	26.	0.013	90.18	1.502
AC-228	1821.38	910.51	26.	100.	0.050	39.12	1.177
AC-228	1936.66	968.12	42.	112.	0.056	43.22	1.820
BI-214	2244.43	1121.92	38.	74.	0.037	59.15	2.148s
K-40	2921.56	1460.27	7.	474.	0.237	14.26	1.829
BI-214	3529.38	1763.97	0.	32.	0.016	53.03	1.516

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		1.2520E-01					
			477.56	1.252E-01	%(	9.541E-01 2.75E-01	G
K-40		1.9957E+01					
			1460.75	1.996E+01	(	6.408E-01 9.48E-01	G
MN-54		3.0983E-02					
			834.81	3.098E-02	%(	8.801E-02 2.61E-02	G
CO-57		1.2330E-02					
			122.07	1.233E-02	%(P	7.814E-02 2.33E-02	G K
			136.43	-8.739E-04	%	6.650E-01 1.96E-01	G
CO-60		-2.7227E-02					
			1332.51	-2.723E-02	&(P	1.141E-01 2.73E-02	G K
			1173.23	-6.519E-03	% P	1.144E-01 2.96E-02	G K
Sr-85		-4.0831E-02					
			514.00	-4.083E-02	%(	1.385E-01 4.12E-02	G
Kr-85		-6.6932E+02					
			513.99	-6.693E+02	%(	2.270E+03 6.76E+02	G
Y-88		-1.0640E-02					
			1836.01	-1.064E-02	&(P	1.308E-01 3.46E-02	G K
			898.02	-1.176E-02	% P	1.207E-01 3.36E-02	G
NB-94		7.4463E-03					
			871.10	7.446E-03	%(	7.379E-02 2.06E-02	G K
			702.50	8.779E-03	%	6.193E-02 1.75E-02	G K
Ag-108M		-3.0261E-02					
			722.95	-3.026E-02	%(	1.043E-01 3.08E-02	G K
			614.37	-2.041E-02	%	9.487E-02 2.78E-02	G
			433.93	-1.233E-02	%	7.482E-02 2.18E-02	G
CD-109		-2.4186E-02					
			88.04	-2.419E-02	%(	2.526E+00 7.51E-01	G
SN-113		-5.7674E-03					
			391.71	-5.767E-03	&(P	1.271E-01 3.64E-02	G K
			255.04	-4.172E-01	%	3.994E+00 1.18E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-3.1678E-02						
		427.95	-3.168E-02	&(	1.838E-01	5.31E-02	G K
		600.77	-4.563E-02	%	3.894E-01	1.11E-01	G
		636.15	-1.196E-01	%	6.540E-01	1.89E-01	G
		463.51	4.044E-01	%	6.846E-01	2.11E-01	G
		176.29	-1.634E-01	%	1.057E+00	3.14E-01	G
I-131	-3.0042E-01						
		364.48	-3.004E-01	%(	1.391E+00	4.11E-01	G K
		636.97	-1.008E+00	%	1.285E+01	3.58E+00	G
		284.29	-2.421E+00	%	1.762E+01	5.20E+00	G
CS-134	3.5186E-02						
		604.66	-6.919E-03	&(	2.322E-01	6.88E-02	G K
		795.76	8.331E-02	(	7.129E-02	2.50E-02	G
		569.29	8.944E-02	%	4.261E-01	1.23E-01	G
		801.84	-9.643E-03	%	8.582E-01	2.35E-01	G
CS-137	2.8617E-01						
		661.62	2.862E-01	(	1.056E-01	4.67E-02	G
CE-139	1.3625E-02						
		165.85	1.363E-02	%(P	9.240E-02	2.75E-02	G
EU-152	-4.0468E-04						
		121.78	-4.047E-04	%(	2.185E-01	6.46E-02	G K
		344.30	-6.214E-02	%	2.269E-01	6.73E-02	G
		1408.08	8.073E-02	%	3.990E-01	1.12E-01	G
		964.00	3.329E-01	&	8.666E-01	2.59E-01	G
		1112.07	-3.103E-03	&	7.005E-01	1.91E-01	G
		778.90	5.576E-02	%	5.762E-01	1.62E-01	G
EU-154	2.8866E-02						
		123.10	2.887E-02	%(	1.432E-01	4.27E-02	G K
		1274.80	5.739E-02	%	2.957E-01	8.43E-02	G
		723.30	-4.240E-02	%	4.358E-01	1.24E-01	G
		1004.80	1.091E-01	%	4.607E-01	1.32E-01	G
EU-155	-2.2859E-03						
		86.45	-2.286E-03	%(	2.912E-01	8.66E-02	G K
		105.31	5.327E-02	%	3.236E-01	9.66E-02	G
HG-203	2.0975E-02						
		279.17	2.097E-02	%(P	1.195E-01	3.50E-02	G K
		72.87	-4.736E-01	&	3.242E+00	9.72E-01	G
		70.83	-4.200E-01	%	5.188E+00	1.55E+00	G
		82.50	-1.984E+00	%	6.039E+00	1.82E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	4.5446E-01						
		583.14	4.545E-01	@(	8.952E-02	4.48E-02	G
		510.72	7.718E-01	+	3.119E-01	1.32E-01	G
PB-212	1.0547E+00						
		238.63	1.055E+00	(	1.674E-01	6.71E-02	G K
							Energy duplication
		77.11	1.322E+00	+	5.590E-01	1.83E-01	G
		74.81	2.282E+00	&	1.066E+00	3.46E-01	G
PB-214	9.5033E-01						
		351.99	9.329E-01	(	1.760E-01	7.50E-02	G K
		295.22	9.840E-01	(	3.076E-01	1.15E-01	G
							Energy duplication
		77.11	2.163E+00	+	9.143E-01	2.99E-01	G
		241.92	-8.346E-01	%	1.261E+00	3.86E-01	G
BI-212	8.3831E-01						
		727.17	8.383E-01	(	6.751E-01	2.58E-01	G K
		1620.56	4.897E-01	&	2.194E+00	5.97E-01	G
		785.42	1.788E+00	%	4.256E+00	1.28E+00	G
BI-214	1.1135E+00						
		609.32	1.127E+00	@(	1.906E-01	1.03E-01	G K
		1764.51	1.074E+00	(	2.474E-01	1.90E-01	G
		1120.28	1.763E+00	+	7.452E-01	3.48E-01	G
RA-224	2.2184E+00						
		241.00	2.218E+00	(	1.943E+00	6.13E-01	G
RA-226	2.3049E+00						
		185.99	2.305E+00	(	1.864E+00	5.92E-01	G
AC-228	1.0233E+00						
		911.07	1.023E+00	(	2.699E-01	1.33E-01	G K
		968.90	2.027E+00	+	5.908E-01	2.92E-01	G
		338.40	1.518E+00	+	5.685E-01	2.41E-01	G
TH-227	-3.8712E-01						
		236.00	-3.871E-01	%(	7.520E-01	2.28E-01	G K
		256.25	2.488E-02	%	9.835E-01	2.88E-01	G
PA-234	-4.2531E-02						
		98.44	-4.253E-02	%(	2.858E-01	8.53E-02	G K
		946.00	-6.424E-02	%	4.602E-01	1.31E-01	G
		131.28	-8.428E-02	%	3.410E-01	1.02E-01	G
		94.67	4.287E-03	%	4.012E-01	1.18E-01	G
		883.24	-9.957E-02	%	5.756E-01	1.62E-01	G
		926.70	2.020E-02	%	6.834E-01	1.86E-01	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.315E-01 %   6.126E-01 1.78E-01 G

TH-234       2.4715E+00
                           63.29 1.208E+00 %(  3.533E+00 1.06E+00 G K
                           92.80 3.146E+00  (  2.483E+00 7.81E-01 G
                           92.38 3.602E+00 &(  2.974E+00 9.33E-01 G

AM-241      -1.0965E-01
                           59.54-1.096E-01 %(P 5.175E-01 1.55E-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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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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	8.2575E-02	1.2520E-01	8.2577E-01	8.2580E-01	6.293E-01
K-40		1.9957E+01	1.9957E+01	2.8451E+00	3.0604E+00	
MN-54	#A	2.8854E-02	3.0983E-02	7.8286E-02	7.8306E-02	8.196E-02
CO-57	#B	1.1356E-02	1.2330E-02	6.9757E-02	6.9760E-02	7.196E-02
CO-60	#B	-2.6915E-02	-2.7227E-02	1.0587E+00	1.0587E+00	1.128E-01

Sr-85	#A	-2.8982E-02	-4.0831E-02	1.2369E-01	1.2372E-01	9.830E-02
Kr-85	#A	-6.6916E+02	-6.6932E+02	2.0274E+03	2.0278E+03	2.269E+03
Y-88	#B	-8.6378E-03	-1.0640E-02	1.4318E-01	1.4318E-01	1.062E-01
NB-94	#B	7.4462E-03	7.4463E-03	6.1689E-02	6.1690E-02	7.379E-02
Ag-108M	#B	-3.0246E-02	-3.0261E-02	9.2392E-02	9.2408E-02	1.043E-01
CD-109	#A	-2.3029E-02	-2.4186E-02	2.2538E+00	2.2538E+00	2.405E+00
SN-113	#B	-4.7547E-03	-5.7674E-03	3.5528E-01	3.5528E-01	1.048E-01
SB-125	#B	-3.0989E-02	-3.1678E-02	1.5943E-01	1.5944E-01	1.798E-01
I-131	#B	-1.8935E-02	-3.0042E-01	1.2329E+00	1.2330E+00	8.766E-02
CS-134	#B	3.4163E-02	3.5186E-02	3.1730E-02	3.1792E-02	2.254E-01
CS-137		2.8559E-01	2.8617E-01	1.4023E-01	1.4116E-01	
CE-139	#A	1.1592E-02	1.3625E-02	8.2415E-02	8.2419E-02	7.861E-02
EU-152	#B	-4.0275E-04	-4.0468E-04	1.9368E-01	1.9368E-01	2.175E-01
EU-154	#B	2.8660E-02	2.8866E-02	1.2811E-01	1.2812E-01	1.422E-01
EU-155	#B	-2.2580E-03	-2.2859E-03	2.5988E-01	2.5988E-01	2.876E-01
HG-203	#B	1.3018E-02	2.0975E-02	1.0494E-01	1.0495E-01	7.415E-02
TL-208	#	4.5446E-01	4.5446E-01	1.3438E-01	1.3681E-01	
PB-212	#	1.0547E+00	1.0547E+00	2.0129E-01	2.0993E-01	1.674E-01
PB-214	#	9.5033E-01	9.5033E-01	2.0194E-01	2.0896E-01	1.760E-01
BI-212		8.3831E-01	8.3831E-01	7.7497E-01	7.7642E-01	
BI-214		1.1135E+00	1.1135E+00	3.0554E-01	3.1195E-01	
RA-224		2.2184E+00	2.2184E+00	1.8385E+00	1.8428E+00	
RA-226	#	2.3048E+00	2.3049E+00	1.7752E+00	1.7800E+00	1.864E+00
AC-228		1.0233E+00	1.0233E+00	4.0032E-01	4.0447E-01	
TH-227	#B	-3.8712E-01	-3.8712E-01	6.8548E-01	6.8583E-01	7.520E-01
PA-234	#B	-4.2531E-02	-4.2531E-02	2.5580E-01	2.5581E-01	2.858E-01
TH-234	#B	2.4715E+00	2.4715E+00	1.8414E+00	1.8465E+00	3.533E+00
AM-241	#A	-1.0963E-01	-1.0965E-01	4.7448E-01	4.7452E-01	5.174E-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) 2.5890589E+01 pCi/gm
Total Decayed Activity (295.1 to 1999.1 keV) 2.5891167E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_4JAN2005_1630.An1

Sample description
FSS-OOL-04-01-024-F SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_4JAN2005_1630.An1

Acquisition information
Start time: 04-Jan-2005 16:25:21
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: 9.8800E+02
Activity scaling factor: 1.0000E+06/(1.0000E+00* 9.8800E+02) =
1.0121E+03
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_4JAN2005_1630.An1

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	06-Dec-2004 11:55:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2675

***** 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	147.	15.59	1.00	1.651E-02				
74.69	147.	15.59	1.00	1.651E-02	74.81	9.600	1.270E+00	PB212
77.10	174.	18.93	1.50	1.720E-02	77.11	10.700	1.291E+00	PB214
					77.11	17.500	7.892E-01	PB212
77.10	174.	18.93	1.50	1.720E-02	77.11	10.700	1.291E+00	PB214
					77.11	17.500	7.892E-01	PB212
86.66	71.	28.83	1.01	1.914E-02	86.45	32.740	1.563E-01	EU155
					88.04	3.790	1.380E+00	CD109
90.07	65.	29.40	1.02	1.960E-02				
93.13	87.	24.82	1.02	1.994E-02	92.38	2.570	2.325E+00	TH234
					92.80	3.000	1.987E+00	TH234
185.93	72.	26.44	1.18	1.859E-02				
185.93	72.	26.44	1.18	1.859E-02	185.99	3.280	1.616E+00	RA226
209.24	54.	35.80	1.01	1.722E-02				
238.64	422.	5.64	1.12	1.557E-02	236.00	11.200	3.277E+00	TH227
					238.63	43.100	8.593E-01	PB212
241.93	83.	18.03	1.12	1.540E-02	241.00	3.900	1.873E+00	RA224
295.34	138.	12.68	0.82	1.292E-02	295.22	19.200	7.620E-01	PB214
338.85	85.	19.88	1.09	1.134E-02	338.40	12.010	8.489E-01	AC228
351.91	243.	10.61	1.15	1.093E-02				
351.91	243.	10.61	1.15	1.093E-02	351.99	37.100	8.200E-01	PB214
462.62	26.	37.32	1.50	8.342E-03	463.51	10.000	PBC<MDA	SB125
510.61	63.	23.25	1.58	7.592E-03	510.72	22.500	5.021E-01	TL208
582.91	116.	14.26	1.33	6.687E-03	583.14	86.000	2.760E-01	TL208
609.22	167.	11.47	1.56	6.414E-03	609.32	46.090	7.728E-01	BI214
661.27	34.	26.94	1.50	5.937E-03	661.62	84.620	9.200E-02	CS137

910.74	63.	14.73	2.11	4.448E-03	911.07	29.000	6.704E-01	AC228
967.94	50.	26.08	1.76	4.212E-03	968.90	17.460	9.299E-01	AC228
1120.23	53.	22.11	1.93	3.711E-03	1120.28	15.040	1.304E+00	BI214
1460.24	328.	5.62	1.78	2.943E-03	1460.75	10.700	1.425E+01	K40

Yankee Chemistry Spectrum name: 101F_4JAN2005_1630.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1764.00	28.	18.90	2.00	2.481E-03	1764.51	15.920	9.695E-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	
172.91	86.77	172.	71.	0.035	86.50	1.013	BI-207	lD
179.72	90.17	153.	65.	0.033	88.21	1.016	PB-214	lD
418.15	209.24	130.	54.	0.027	107.41	1.012	AC-228	
476.98	238.62	72.	422.	0.211	16.93	1.121	PB-212	D
483.57	241.92	69.	83.	0.041	54.10	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	148.98	74.71	467.	119.	0.059	81.88	1.499
PB-214	153.79	77.11	454.	174.	0.087	56.80	1.499D
PB-212	153.79	77.11	454.	174.	0.087	56.80	1.499D
TH-234	185.23	92.83	393.	105.	0.052	85.53	1.499
TH-234	185.21	92.81	391.	101.	0.050	88.42	1.499
RA-226	371.73	186.04	184.	74.	0.037	84.88	1.499s
TH-227	477.07	238.69	147.	241.	0.120	28.80	1.499s
PB-212	476.96	238.63	180.	245.	0.123	30.13	1.499D
RA-224	483.67	241.98	222.	66.	0.033	102.90	1.499
PB-214	590.19	295.22	96.	121.	0.061	43.84	1.499
AC-228	677.48	338.85	68.	85.	0.042	59.65	1.094s
PB-214	703.58	351.89	61.	198.	0.099	27.09	1.499
SB-125	925.13	462.62	33.	26.	0.013	111.96	1.499s
TL-208	1021.16	510.61	48.	63.	0.031	69.74	1.579s
TL-208	1165.84	582.91	45.	116.	0.058	42.77	1.329
BI-214	1218.48	609.22	54.	167.	0.083	34.40	1.556
CS-137	1322.63	661.27	24.	34.	0.017	80.81	1.499s
AC-228	1821.83	910.74	10.	63.	0.032	44.20	2.114s
AC-228	1936.30	967.94	30.	50.	0.025	78.23	1.760
BI-214	2241.05	1120.23	20.	53.	0.027	66.33	1.926s
K-40	2921.50	1460.24	3.	328.	0.164	16.85	1.780
BI-214	3529.43	1764.00	0.	28.	0.014	56.69	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	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		0.0000E+00					
			477.56	0.000E+00	&(	7.663E-01 2.13E-01	G
K-40		1.4254E+01					
			1460.75	1.425E+01	(	4.625E-01 8.00E-01	G
MN-54		2.1857E-02					
			834.81	2.186E-02	&(	7.777E-02 2.26E-02	G
CO-57		2.3922E-03					
			122.07	2.392E-03	%(P	6.903E-02 2.03E-02	G K
			136.43	-1.237E-01	&	4.977E-01 1.48E-01	G
CO-60		-1.6938E-02					
			1332.51	-1.694E-02	%(P	9.746E-02 2.19E-02	G K
			1173.23	3.679E-03	% P	1.002E-01 2.55E-02	G K
Sr-85		-2.8337E-02					
			514.00	-2.834E-02	&(	1.125E-01 3.32E-02	G
Kr-85		-4.7938E+02					
			513.99	-4.794E+02	&(	1.901E+03 5.61E+02	G
Y-88		-4.8927E-03					
			1836.01	-4.893E-03	&(P	1.097E-01 2.75E-02	G K
			898.02	-3.125E-03	& P	1.135E-01 3.09E-02	G
NB-94		5.4856E-03					
			871.10	5.486E-03	%(	6.231E-02 1.70E-02	G K
			702.50	4.554E-03	%	6.811E-02 1.90E-02	G K
Ag-108M		0.0000E+00					
			722.95	0.000E+00	%(	1.224E-01 3.49E-02	G K
			614.37	-1.691E-02	&	9.174E-02 2.67E-02	G
			433.93	-8.425E-03	%	5.516E-02 1.58E-02	G
CD-109		-1.1434E-01					
			88.04	-1.143E-01	&(	1.868E+00 5.53E-01	G
SN-113		-3.4150E-03					
			391.71	-3.415E-03	%(P	1.125E-01 3.18E-02	G K
			255.04	-3.890E-01	%	2.915E+00 8.53E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.0839E-01						
		427.95	0.000E+00	%(	2.261E-01	6.43E-02	G K
		600.77	4.758E-03	%	2.745E-01	7.41E-02	G
		636.15	-7.483E-02	%	6.428E-01	1.83E-01	G
		463.51	4.292E-01	*(	4.932E-01	1.60E-01	G
		176.29	3.695E-02	&	8.323E-01	2.44E-01	G
I-131	1.6914E-01						
		364.48	1.691E-01	%(	6.945E-01	2.03E-01	G K
		636.97	-9.043E-01	%	1.072E+01	3.00E+00	G
		284.29	3.162E+00	%	8.902E+00	2.66E+00	G
CS-134	0.0000E+00						
		604.66	0.000E+00	%(	1.820E-01	5.34E-02	G K
		795.76	-2.791E-04	%	8.026E-02	2.17E-02	G
		569.29	0.000E+00	&	4.768E-01	1.34E-01	G
		801.84	2.387E-01	%	6.905E-01	2.03E-01	G
CS-137	9.1999E-02						
		661.62	9.200E-02	(	7.019E-02	2.48E-02	G
CE-139	-1.6812E-02						
		165.85	-1.681E-02	%(P	8.024E-02	2.39E-02	G
EU-152	4.7291E-03						
		121.78	4.729E-03	%(	2.032E-01	5.99E-02	G K
		344.30	7.395E-02	%	1.453E-01	4.43E-02	G
		1408.08	8.914E-02	%	3.216E-01	9.12E-02	G
		964.00	-9.986E-02	&	8.419E-01	2.42E-01	G
		1112.07	-1.180E-01	%	7.324E-01	2.08E-01	G
		778.90	1.847E-01	%	4.934E-01	1.46E-01	G
EU-154	-4.9525E-02						
		123.10	-4.952E-02	%(	1.359E-01	4.09E-02	G K
		1274.80	-2.995E-03	&	2.831E-01	7.65E-02	G
		723.30	0.000E+00	&	6.143E-01	1.76E-01	G
		1004.80	-1.171E-03	&	4.551E-01	1.22E-01	G
EU-155	7.8882E-02						
		86.45	7.888E-02	%(	2.367E-01	7.12E-02	G K
		105.31	9.119E-02	%	2.434E-01	7.33E-02	G
HG-203	3.4508E-02						
		279.17	3.451E-02	%(P	8.962E-02	2.65E-02	G K
		72.87	-8.884E-01	%	2.510E+00	7.57E-01	G
		70.83	-1.789E+00	%	4.159E+00	1.26E+00	G
		82.50	-1.480E+00	%	4.954E+00	1.49E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.7600E-01						
		583.14	2.760E-01	(	8.082E-02	3.93E-02	G
		510.72	5.021E-01	+	2.811E-01	1.17E-01	G
PB-212	4.9935E-01						
							Energy duplication
		238.63	4.994E-01	(	1.331E-01	5.02E-02	G K
							Energy duplication
		77.11	7.892E-01	+	4.634E-01	1.49E-01	G
		74.81	1.025E+00	&	8.913E-01	2.80E-01	G
PB-214	6.6814E-01						
		351.99	6.683E-01	(	1.319E-01	6.04E-02	G K
		295.22	6.678E-01	(	2.667E-01	9.76E-02	G
							Energy duplication
		77.11	1.291E+00	+	7.579E-01	2.44E-01	G
							Energy duplication
		241.92	7.851E-03	%	9.266E-01	2.72E-01	G
BI-212	3.9062E-01						
		727.17	3.906E-01	%(	5.976E-01	1.88E-01	G K
		1620.56	0.000E+00	%	2.948E+00	7.42E-01	G
		785.42	1.434E-01	%	4.525E+00	1.27E+00	G
BI-214	8.2331E-01						
		609.32	7.728E-01	(	1.710E-01	8.86E-02	G K
		1764.51	9.695E-01	(	2.552E-01	1.83E-01	G
		1120.28	1.304E+00	+	5.746E-01	2.88E-01	G
RA-224	1.4950E+00						
		241.00	1.495E+00	(	1.638E+00	5.13E-01	G
RA-226	1.6670E+00						
		185.99	1.667E+00	*(	1.478E+00	4.72E-01	G
AC-228	7.8454E-01						
		911.07	6.704E-01	*(	1.835E-01	9.87E-02	G K
		968.90	9.299E-01	(	5.251E-01	2.42E-01	G
		338.40	8.489E-01	@(	4.139E-01	1.69E-01	G
TH-227	1.8705E+00						
		236.00	1.870E+00	?(	4.595E-01	1.80E-01	G K
		256.25	-9.409E-02	%	7.788E-01	2.28E-01	G
PA-234	-1.9971E-02						
		98.44	-1.997E-02	%(	2.327E-01	6.88E-02	G K
		946.00	-5.474E-02	%	4.053E-01	1.14E-01	G
		131.28	5.182E-02	&	2.729E-01	8.12E-02	G
		94.67	-1.480E-01	%	4.304E-01	1.30E-01	G
		883.24	0.000E+00	%	4.186E-01	1.07E-01	G

926.70 1.409E-01 % 6.989E-01 1.99E-01 G

Yankee Chemistry Spectrum name: 101F_4JAN2005_1630.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		569.26	0.000E+00	&	6.887E-01	1.93E-01	G
TH-234	1.9864E+00						
		63.29	1.198E+00	%(	2.951E+00	8.91E-01	G K
		92.80	2.310E+00	&(	2.174E+00	6.81E-01	G
		92.38	2.805E+00	&(	2.548E+00	8.00E-01	G
AM-241	3.1178E-02						
		59.54	3.118E-02	%(P	4.138E-01	1.22E-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	0.0000E+00	0.0000E+00	6.3859E-01	6.3859E-01	5.246E-01
K-40		1.4254E+01	1.4254E+01	2.4010E+00	2.5325E+00	
MN-54	#A	2.0485E-02	2.1857E-02	6.7869E-02	6.7881E-02	7.289E-02
CO-57	#B	2.2195E-03	2.3922E-03	6.0914E-02	6.0914E-02	6.404E-02
CO-60	#B	-1.6761E-02	-1.6938E-02	2.6655E-01	2.6655E-01	9.644E-02

Sr-85	#A	-2.0742E-02	-2.8337E-02	9.9497E-02	9.9509E-02	8.233E-02
Kr-85	#A	-4.7927E+02	-4.7938E+02	1.6819E+03	1.6821E+03	1.901E+03
Y-88	#B	-4.0469E-03	-4.8927E-03	1.7185E-01	1.7186E-01	9.072E-02
NB-94	#B	5.4856E-03	5.4856E-03	5.0892E-02	5.0893E-02	6.231E-02
Ag-108M	#B	0.0000E+00	0.0000E+00	1.0466E-01	1.0466E-01	1.224E-01
CD-109	#A	-1.0935E-01	-1.1434E-01	1.6589E+00	1.6589E+00	1.787E+00
SN-113	#B	-2.8645E-03	-3.4150E-03	1.9647E+00	1.9647E+00	9.436E-02
SB-125	#B	1.0624E-01	1.0839E-01	1.2135E-01	1.2150E-01	2.216E-01
I-131	#B	1.3659E-02	1.6914E-01	6.0876E-01	6.0883E-01	5.608E-02
CS-134	#B	0.0000E+00	0.0000E+00	1.6019E-01	1.6019E-01	1.772E-01
CS-137	#	9.1830E-02	9.1999E-02	7.4344E-02	7.4526E-02	7.006E-02
CE-139	#A	-1.4512E-02	-1.6812E-02	7.2826E-02	7.2833E-02	6.926E-02
EU-152	#B	4.7085E-03	4.7291E-03	1.7977E-01	1.7977E-01	2.023E-01
EU-154	#B	-4.9203E-02	-4.9525E-02	1.2274E-01	1.2277E-01	1.350E-01
EU-155	#B	7.8006E-02	7.8882E-02	2.1372E-01	2.1377E-01	2.340E-01
HG-203	#B	2.2353E-02	3.4508E-02	7.9614E-02	7.9637E-02	5.805E-02
TL-208		2.7600E-01	2.7600E-01	1.1804E-01	1.1907E-01	
PB-212	#	4.9935E-01	4.9935E-01	1.5047E-01	1.5309E-01	1.331E-01
PB-214	#	6.6814E-01	6.6814E-01	1.7216E-01	1.7625E-01	1.319E-01
BI-212	#B	3.9062E-01	3.9062E-01	5.6257E-01	5.6300E-01	5.976E-01
BI-214		8.2331E-01	8.2331E-01	2.7300E-01	2.7693E-01	
RA-224	#A	1.4950E+00	1.4950E+00	1.5383E+00	1.5406E+00	1.638E+00
RA-226	#	1.6669E+00	1.6670E+00	1.4149E+00	1.4180E+00	1.478E+00
AC-228		7.8454E-01	7.8454E-01	2.8205E-01	2.8551E-01	
TH-227	#	1.8705E+00	1.8705E+00	5.3866E-01	5.4893E-01	4.595E-01
PA-234	#B	-1.9971E-02	-1.9971E-02	2.0641E-01	2.0641E-01	2.327E-01
TH-234	#B	1.9864E+00	1.9864E+00	1.6877E+00	1.6913E+00	2.951E+00
AM-241	#A	3.1174E-02	3.1178E-02	3.6749E-01	3.6749E-01	4.138E-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) 1.6137398E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.6137398E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_4JAN2005_1710.An1

Sample description
FSS-OOL-04-01-014-F SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_4JAN2005_1710.An1

Acquisition information
Start time: 04-Jan-2005 17:01:12
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: 1.3340E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.3340E+03) =
7.4963E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_4JAN2005_1710.An1

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	06-Dec-2004 11:31:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2242

***** 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
74.08	94.	30.50	1.00	1.645E-02	72.87	6.400	1.441E+00	HG203
					74.81	9.600	5.976E-01	PB212
77.35	294.	9.79	1.01	1.738E-02	77.11	10.700	1.618E+00	PB214
					77.11	17.500	9.891E-01	PB212
87.13	114.	22.15	1.01	1.924E-02	86.45	32.740	1.863E-01	EU155
89.62	71.	34.18	1.02	1.957E-02	88.04	3.790	1.032E+00	CD109
92.94	118.	20.50	1.02	1.994E-02	92.38	2.570	2.338E+00	TH234
					92.80	3.000	1.998E+00	TH234
185.85	99.	22.77	1.13	1.859E-02				
185.85	99.	22.77	1.13	1.859E-02	185.99	3.280	1.649E+00	RA226
209.40	42.	40.66	0.65	1.721E-02				
238.65	580.	4.94	1.12	1.558E-02				
238.65	580.	4.94	1.12	1.558E-02	238.63	43.100	8.755E-01	PB212
241.45	90.	20.58	1.12	1.543E-02	241.00	3.900	1.511E+00	RA224
269.72	56.	39.64	0.90	1.403E-02				
295.20	158.	12.95	1.05	1.292E-02				
295.20	158.	12.95	1.05	1.292E-02	295.22	19.200	6.448E-01	PB214
328.26	41.	36.38	0.89	1.169E-02				
338.44	130.	15.24	1.42	1.135E-02	338.40	12.010	9.661E-01	AC228
351.83	260.	8.26	1.10	1.093E-02				
351.83	260.	8.26	1.10	1.093E-02	351.99	37.100	6.498E-01	PB214
463.18	46.	23.81	0.73	8.348E-03				
463.18	46.	23.81	0.73	8.348E-03	463.51	10.000	5.699E-01	SB125
510.25	72.	21.72	1.80	7.597E-03				
510.25	72.	21.72	1.80	7.597E-03	510.72	22.500	4.271E-01	TL208
582.99	161.	10.97	1.56	6.686E-03				

582.99	161.	10.97	1.56	6.686E-03	583.14	86.000	2.837E-01	TL208
609.27	201.	8.96	1.57	6.413E-03	609.32	46.090	6.893E-01	BI214
661.65	32.	30.36	1.50	5.937E-03	661.62	84.620	6.516E-02	CS137
727.17	28.	31.39	1.38	5.443E-03	727.17	11.800	4.448E-01	BI212
911.04	114.	11.81	1.85	4.447E-03	911.07	29.000	8.956E-01	AC228
968.23	86.	14.62	1.70	4.215E-03	968.90	17.460	1.185E+00	AC228
1119.48	74.	21.54	1.06	3.713E-03	1120.28	15.040	1.343E+00	BI214
1460.31	483.	4.85	1.80	2.943E-03	1460.75	10.700	1.553E+01	K40
1764.17	27.	19.25	0.62	2.481E-03	1764.51	15.920	6.924E-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
178.81	89.93	262.	71.	0.036	102.54	1.015	PB-214 lD
418.48	209.40	142.	42.	0.021	121.99	0.646	AC-228 s
477.01	238.58	121.	580.	0.290	14.83	1.122	PB-212 D
539.17	269.72	168.	56.	0.028	118.92	0.898	AC-228 s
656.30	328.26	87.	41.	0.021	109.15	0.892	RH-106M 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	149.17	74.80	778.	170.	0.085	73.33	1.499
PB-214	153.79	77.11	662.	250.	0.125	47.54	1.499D
PB-212	153.79	77.11	662.	250.	0.125	47.54	1.499D
EU-155	173.84	87.13	724.	99.	0.049	119.72	1.499
TH-234	185.44	92.93	632.	142.	0.071	79.47	1.499s
TH-234	185.48	92.95	629.	124.	0.062	89.90	1.499s
RA-226	371.50	185.92	290.	105.	0.053	74.79	1.499
PB-212	476.86	238.58	265.	443.	0.221	21.14	1.499
RA-224	481.70	241.00	289.	76.	0.038	100.39	1.123D
PB-214	590.35	295.30	136.	136.	0.068	44.46	1.499
AC-228	676.66	338.44	105.	130.	0.065	45.72	1.419
PB-214	703.50	351.85	76.	247.	0.123	24.28	1.499
SB-125	925.79	462.95	44.	39.	0.019	87.28	1.499s
TL-208	1020.85	510.45	72.	58.	0.029	73.64	1.499s
TL-208	1166.27	583.13	47.	156.	0.078	30.45	1.499s
BI-214	1218.57	609.27	46.	201.	0.101	26.89	1.572
CS-137	1323.38	661.65	32.	32.	0.016	91.07	1.499
BI-212	1454.49	727.17	31.	26.	0.013	109.06	1.499D
AC-228	1822.43	911.04	28.	114.	0.057	35.42	1.853s
AC-228	1936.88	968.23	24.	86.	0.043	43.85	1.705
BI-214	2239.54	1119.48	45.	74.	0.037	64.61	1.064s
K-40	2921.63	1460.31	14.	483.	0.241	14.56	1.795
BI-214	3529.78	1764.17	0.	27.	0.014	57.74	0.619s

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		3.0558E-01					
			477.56	3.056E-01	%(	5.195E-01 1.61E-01	G
K-40		1.5528E+01					
			1460.75	1.553E+01	(	6.562E-01 7.54E-01	G
MN-54		4.2648E-03					
			834.81	4.265E-03	%(	5.959E-02 1.65E-02	G
CO-57		-1.2467E-02					
			122.07	-1.247E-02	%(P	6.647E-02 1.98E-02	G K
			136.43	7.985E-02	%	4.977E-01 1.48E-01	G
CO-60		-1.0087E-02					
			1332.51	-1.009E-02	%(P	7.428E-02 1.72E-02	G K
			1173.23	1.757E-02	% P	7.298E-02 1.96E-02	G K
Sr-85		-4.1264E-02					
			514.00	-4.126E-02	&(	9.838E-02 2.97E-02	G
Kr-85		-6.9711E+02					
			513.99	-6.971E+02	&(	1.662E+03 5.01E+02	G
Y-88		-1.2717E-03					
			1836.01	-1.272E-03	%(P	3.800E-02 5.16E-03	G K
			898.02	-1.374E-02	% P	8.709E-02 2.45E-02	G
NB-94		1.4671E-02					
			871.10	1.467E-02	%(	5.674E-02 1.64E-02	G K
			702.50	8.517E-03	%	5.170E-02 1.47E-02	G K
Ag-108M		-2.1506E-02					
			722.95	-2.151E-02	%(	7.498E-02 2.21E-02	G K
			614.37	-1.177E-02	&	5.902E-02 1.71E-02	G
			433.93	-3.441E-03	%	5.190E-02 1.49E-02	G
CD-109		5.3308E-01					
			88.04	5.331E-01	%(	1.897E+00 5.71E-01	G
SN-113		-2.4989E-04					
			391.71	-2.499E-04	&(P	7.567E-02 2.13E-02	G K
			255.04	4.455E-01	&	2.714E+00 8.02E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.0566E-01						
		427.95	-1.988E-02	%(	1.702E-01	4.92E-02	G K
		600.77	-8.638E-05	&	3.253E-01	9.16E-02	G
		636.15	0.000E+00	%	6.172E-01	1.75E-01	G
		463.51	4.772E-01	(	4.145E-01	1.39E-01	G
		176.29	2.229E-02	%	7.836E-01	2.31E-01	G
I-131	2.2816E-01						
		364.48	2.282E-01	%(	6.801E-01	2.03E-01	G K
		636.97	6.893E-02	%	1.045E+01	2.94E+00	G
		284.29	-3.229E-01	&	9.495E+00	2.76E+00	G
CS-134	0.0000E+00						
		604.66	0.000E+00	%(	1.635E-01	4.83E-02	G K
		795.76	0.000E+00	&	7.259E-02	2.00E-02	G
		569.29	1.510E-01	%	3.342E-01	1.01E-01	G
		801.84	1.493E-01	&	5.441E-01	1.57E-01	G
CS-137	6.5160E-02						
		661.62	6.516E-02	(	5.857E-02	1.98E-02	G
CE-139	2.2544E-02						
		165.85	2.254E-02	&(P	6.480E-02	1.95E-02	G
EU-152	-2.9769E-02						
		121.78	-2.977E-02	%(	1.853E-01	5.53E-02	G K
		344.30	6.153E-03	&	1.801E-01	5.21E-02	G
		1408.08	3.794E-02	%	3.359E-01	9.23E-02	G
		964.00	-2.946E-01	%	7.271E-01	2.19E-01	G
		1112.07	-1.216E-01	&	6.662E-01	1.92E-01	G
		778.90	-8.221E-02	%	4.990E-01	1.43E-01	G
EU-154	-2.3919E-02						
		123.10	-2.392E-02	&(	1.245E-01	3.72E-02	G K
		1274.80	1.627E-04	&	2.263E-01	6.16E-02	G
		723.30	1.762E-03	%	2.406E-01	6.54E-02	G
		1004.80	-9.742E-02	&	4.109E-01	1.19E-01	G
EU-155	1.6149E-01						
		86.45	1.615E-01	(	2.099E-01	6.44E-02	G K
		105.31	1.063E-01	%	2.363E-01	7.16E-02	G
HG-203	-6.8636E-03						
		279.17	-6.864E-03	&(P	9.996E-02	2.88E-02	G K
		72.87	6.618E-01	%	2.165E+00	6.52E-01	G
		70.83	1.534E+00	&	3.630E+00	1.10E+00	G
		82.50	-1.380E+00	%	4.764E+00	1.43E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.8895E-01						
		583.14	2.747E-01	@(	6.121E-02	2.79E-02	G
		510.72	3.434E-01	(	2.507E-01	8.43E-02	G
PB-212	6.6840E-01						
		238.63	6.684E-01	(	1.186E-01	4.71E-02	G K
							Energy duplication
		77.11	8.422E-01	+	4.124E-01	1.33E-01	G
		74.81	1.084E+00	&	8.464E-01	2.65E-01	G
PB-214	5.9677E-01						
		351.99	6.173E-01	(	1.085E-01	5.00E-02	G K
		295.22	5.571E-01	(	2.331E-01	8.26E-02	G
							Energy duplication
		77.11	1.377E+00	+	6.745E-01	2.18E-01	G
		241.92	-3.190E-01	%	8.017E-01	2.42E-01	G
BI-212	4.0611E-01						
							Energy duplication
		727.17	4.061E-01	(	4.515E-01	1.48E-01	G K
		1620.56	-7.228E-03	%	2.616E+00	6.82E-01	G
		785.42	3.685E-01	%	2.973E+00	8.42E-01	G
BI-214	6.9006E-01						
		609.32	6.893E-01	(	1.175E-01	6.18E-02	G K
		1764.51	6.924E-01	(	1.890E-01	1.33E-01	G
		1120.28	1.343E+00	+	6.166E-01	2.89E-01	G
RA-224	1.2845E+00						
		241.00	1.284E+00	(	1.377E+00	4.30E-01	G
RA-226	1.7458E+00						
		185.99	1.746E+00	(	1.365E+00	4.35E-01	G
AC-228	9.9636E-01						
		911.07	8.956E-01	@(	2.150E-01	1.06E-01	G K
		968.90	1.185E+00	(	3.518E-01	1.73E-01	G
		338.40	9.661E-01	(	3.750E-01	1.47E-01	G
TH-227	-1.1007E-01						
		236.00	-1.101E-01	%(	5.499E-01	1.64E-01	G K
		256.25	1.192E-01	&	6.877E-01	2.03E-01	G
PA-234	-3.3574E-02						
		98.44	-3.357E-02	%(	2.143E-01	6.39E-02	G K
		946.00	6.173E-02	%	2.836E-01	8.10E-02	G
		131.28	-1.050E-02	%	2.622E-01	7.78E-02	G
		94.67	-1.086E-01	&	4.000E-01	1.20E-01	G
		883.24	0.000E+00	%	6.071E-01	1.69E-01	G
		926.70	2.165E-01	%	6.224E-01	1.84E-01	G

Yankee Chemistry Spectrum name: 101F_4JAN2005_1710.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		569.26	2.181E-01	%	4.827E-01	1.46E-01	G
TH-234	1.7189E+00						
		63.29	7.021E-01	%(	2.742E+00	8.23E-01	G K
		92.80	2.106E+00	(	2.030E+00	6.31E-01	G
		92.38	2.810E+00	(	2.380E+00	7.44E-01	G
AM-241	-2.9511E-02						
		59.54	-2.951E-02	%(P	3.667E-01	1.09E-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	2.0910E-01	3.0558E-01	4.8269E-01	4.8300E-01	3.555E-01
K-40		1.5528E+01	1.5528E+01	2.2613E+00	2.4256E+00	
MN-54	#A	3.9969E-03	4.2648E-03	4.9578E-02	4.9578E-02	5.584E-02
CO-57	#B	-1.1565E-02	-1.2467E-02	6.7607E-02	6.7611E-02	6.166E-02
CO-60	#B	-9.9817E-03	-1.0087E-02	1.4929E-01	1.4929E-01	7.350E-02

Sr-85	#A	-3.0190E-02	-4.1264E-02	8.8957E-02	8.8987E-02	7.198E-02
Kr-85	#A	-6.9696E+02	-6.9711E+02	1.5028E+03	1.5034E+03	1.662E+03
Y-88	#B	-1.0516E-03	-1.2717E-03	7.6303E-03	7.6306E-03	3.142E-02
NB-94	#B	1.4671E-02	1.4671E-02	4.9283E-02	4.9290E-02	5.674E-02
Ag-108M	#B	-2.1497E-02	-2.1506E-02	6.6271E-02	6.6282E-02	7.494E-02
CD-109	#A	5.0978E-01	5.3308E-01	1.7117E+00	1.7120E+00	1.814E+00
SN-113	#B	-2.0956E-04	-2.4989E-04	7.9426E-02	7.9426E-02	6.346E-02
SB-125	#B	1.0356E-01	1.0566E-01	9.2216E-02	9.2409E-02	1.668E-01
I-131	#B	1.8359E-02	2.2816E-01	6.0828E-01	6.0842E-01	5.473E-02
CS-134	#B	0.0000E+00	0.0000E+00	1.4482E-01	1.4482E-01	1.592E-01
CS-137	#	6.5040E-02	6.5160E-02	5.9340E-02	5.9454E-02	5.846E-02
CE-139	#A	1.9456E-02	2.2544E-02	5.8462E-02	5.8476E-02	5.592E-02
EU-152	#B	-2.9639E-02	-2.9769E-02	1.6594E-01	1.6595E-01	1.844E-01
EU-154	#B	-2.3764E-02	-2.3919E-02	1.1152E-01	1.1153E-01	1.236E-01
EU-155	#A	1.5969E-01	1.6149E-01	1.9333E-01	1.9353E-01	2.076E-01
HG-203	#B	-4.4432E-03	-6.8636E-03	3.6155E+00	3.6155E+00	6.471E-02
TL-208	#	2.8895E-01	2.8895E-01	8.7981E-02	8.9483E-02	6.121E-02
PB-212	#	6.6840E-01	6.6840E-01	1.4127E-01	1.4623E-01	1.186E-01
PB-214	#	5.9677E-01	5.9677E-01	1.4489E-01	1.4877E-01	1.085E-01
BI-212	#A	4.0611E-01	4.0611E-01	4.4291E-01	4.4350E-01	4.515E-01
BI-214		6.9006E-01	6.9006E-01	1.8559E-01	1.8964E-01	
RA-224	A	1.2845E+00	1.2845E+00	1.2895E+00	1.2916E+00	
RA-226	#	1.7458E+00	1.7458E+00	1.3057E+00	1.3094E+00	1.365E+00
AC-228		9.9636E-01	9.9636E-01	2.4105E-01	2.4754E-01	
TH-227	#B	-1.1007E-01	-1.1007E-01	4.9224E-01	4.9228E-01	5.499E-01
PA-234	#B	-3.3574E-02	-3.3574E-02	1.9175E-01	1.9176E-01	2.143E-01
TH-234	#B	1.7189E+00	1.7189E+00	1.3661E+00	1.3694E+00	2.742E+00
AM-241	#A	-2.9508E-02	-2.9511E-02	3.4628E-01	3.4628E-01	3.666E-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) 1.8498512E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 1.8498512E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_4JAN2005_1825.An1

Sample description
FSS-OOL-04-01-020-F SOIL REPEAT

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_4JAN2005_1825.An1

Acquisition information
Start time: 04-Jan-2005 18:14:45
Live time: 2000
Real time: 2003
Dead time: 0.12 %
Detector ID: 1

Detector system
Det 101- DSPE-633

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

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

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

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

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 9.0700E+02
Activity scaling factor: 1.0000E+06/(1.0000E+00* 9.0700E+02) =
1.1025E+03
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_4JAN2005_1825.An1

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	03-Dec-2004 14:10:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2589

***** 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	281.	11.33	1.00	1.651E-02				
74.75	281.	11.33	1.00	1.651E-02	74.81	9.600	2.633E+00	PB212
77.05	336.	13.21	1.50	1.720E-02	77.11	10.700	2.723E+00	PB214
					77.11	17.500	1.665E+00	PB212
77.05	336.	13.21	1.50	1.720E-02	77.11	10.700	2.723E+00	PB214
					77.11	17.500	1.665E+00	PB212
87.25	106.	36.20	1.50	1.910E-02	86.45	32.740	PBC<MDA	EU155
92.95	116.	31.02	1.50	1.985E-02	92.38	2.570	3.399E+00	TH234
					92.80	3.000	2.905E+00	TH234
93.02	121.	29.03	1.50	1.989E-02	92.38	2.570	3.521E+00	TH234
					92.80	3.000	3.009E+00	TH234
186.07	196.	15.72	0.97	1.858E-02	185.99	3.280	4.803E+00	RA226
238.64	781.	4.08	1.12	1.558E-02				
238.64	781.	4.08	1.12	1.558E-02	238.63	43.100	1.733E+00	PB212
242.05	138.	14.80	1.12	1.540E-02	241.00	3.900	3.401E+00	RA224
243.31	78.	38.55	1.50	1.540E-02	241.92	7.470	PBC<MDA	PB214
269.12	62.	33.82	0.92	1.406E-02				
277.91	42.	41.54	1.15	1.366E-02				
295.11	233.	9.41	1.43	1.292E-02				
295.11	233.	9.41	1.43	1.292E-02	295.22	19.200	1.400E+00	PB214
300.20	49.	38.47	0.96	1.272E-02				
328.38	60.	37.30	0.64	1.168E-02				
338.33	129.	16.28	1.21	1.135E-02	338.40	12.010	1.410E+00	AC228
351.85	323.	7.69	1.14	1.093E-02				
351.85	323.	7.69	1.14	1.093E-02	351.99	37.100	1.189E+00	PB214
462.76	59.	24.90	0.93	8.355E-03				

462.76	59.	24.90	0.93	8.355E-03	463.51	10.000	1.081E+00	SB125
510.53	92.	19.31	1.07	7.593E-03	510.72	22.500	7.991E-01	TL208
582.97	214.	10.72	1.21	6.686E-03	583.14	86.000	5.546E-01	TL208
609.08	250.	8.75	1.32	6.415E-03	609.32	46.090	1.259E+00	BI214
661.39	88.	19.02	0.78	5.939E-03	661.62	84.620	2.603E-01	CS137
726.84	65.	26.33	0.84	5.445E-03	727.17	11.800	1.499E+00	BI212
770.71	56.	21.53	1.67	5.163E-03				
794.74	46.	31.98	1.11	5.022E-03				
794.74	46.	31.98	1.11	5.022E-03	795.76	85.400	1.630E-01	CS134
910.93	140.	11.81	1.29	4.447E-03	911.07	29.000	1.620E+00	AC228

Yankee Chemistry Spectrum name: 101F_4JAN2005_1825.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
968.23	108.	14.34	1.81	4.215E-03	968.90	17.460	2.188E+00	AC228
1120.21	64.	17.04	1.53	3.711E-03	1120.28	15.040	1.722E+00	BI214
1460.35	410.	5.22	1.92	2.943E-03	1460.75	10.700	1.940E+01	K40
1587.99	43.	15.25	1.08	2.731E-03				
1763.98	42.	15.43	2.00	2.481E-03	1764.51	15.920	1.584E+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	
476.99	238.59	116.	781.	0.390	12.23	1.122	PB-212	D
537.96	269.12	160.	62.	0.031	101.47	0.924	AC-228	s
600.15	300.20	129.	49.	0.025	106.95	0.964	PB-212	
656.53	328.38	152.	60.	0.030	111.89	0.636	RH-106M	s
1541.62	770.71	21.	63.	0.032	48.44	1.674	AC-228	sM
1589.70	794.74	46.	47.	0.023	76.07	1.112	AC-228	s
3177.16	1587.99	0.	43.	0.022	45.75	1.083	AC-228	s

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

This section based on library: 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	149.13	74.78	910.	249.	0.124	54.86	1.499
PB-214	153.79	77.11	818.	336.	0.168	39.62	1.499D
PB-212	153.79	77.11	818.	336.	0.168	39.62	1.499D
EU-155	174.08	87.25	687.	106.	0.053	108.59	1.499
TH-234	185.49	92.95	593.	116.	0.058	93.06	1.499
TH-234	185.62	93.02	552.	121.	0.060	87.09	1.499
RA-226	371.95	186.15	305.	135.	0.068	60.63	1.499s
PB-212	476.94	238.62	301.	554.	0.277	18.40	1.499
RA-224	481.70	241.00	333.	106.	0.053	78.81	1.123D
PB-214	486.32	243.31	417.	78.	0.039	115.65	1.499
PB-214	590.17	295.21	126.	238.	0.119	27.89	1.499s
AC-228	676.44	338.33	120.	129.	0.064	48.84	1.207s
PB-214	703.58	351.89	110.	292.	0.146	23.23	1.499
SB-125	925.57	462.84	65.	42.	0.021	94.11	1.499
TL-208	1020.99	510.53	71.	92.	0.046	57.94	1.072s
TL-208	1165.95	582.97	78.	214.	0.107	32.15	1.211
BI-214	1218.20	609.08	67.	250.	0.125	26.26	1.319

Yankee Chemistry Spectrum name: 101F_4JAN2005_1825.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CS-137	1322.88	661.39	59.	88.	0.044	57.07	0.784s
Ag-108M	1454.61	727.23	29.	41.	0.020	73.28	1.499s
BI-212	1453.84	726.84	62.	65.	0.032	78.98	0.838s
AC-228	1822.20	910.93	42.	140.	0.070	35.42	1.289s
AC-228	1936.88	968.23	33.	108.	0.054	43.03	1.806s
BI-214	2241.01	1120.21	22.	64.	0.032	51.11	1.528
K-40	2921.72	1460.35	12.	410.	0.205	15.66	1.921
BI-214	3529.40	1763.98	0.	42.	0.021	46.29	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		-2.0328E-01						
			477.56	-2.033E-01	%(	1.044E+00	3.04E-01	G
K-40		1.9402E+01						
			1460.75	1.940E+01	(	8.922E-01	1.01E+00	G
MN-54		1.5771E-02						
			834.81	1.577E-02	%(	9.378E-02	2.67E-02	G
CO-57		-7.8671E-03						
			122.07	-7.867E-03	%(P	8.703E-02	2.58E-02	G K
			136.43	5.500E-03	%	7.586E-01	2.24E-01	G
CO-60		5.1541E-03						
			1332.51	5.154E-03	%(P	1.100E-01	2.74E-02	G K
			1173.23	-1.169E-02	% P	1.110E-01	2.72E-02	G K
Sr-85		-3.9224E-02						
			514.00	-3.922E-02	%(	1.434E-01	4.25E-02	G
Kr-85		-6.4217E+02						
			513.99	-6.422E+02	%(	2.347E+03	6.96E+02	G
Y-88		-2.7535E-02						
			1836.01	-2.753E-02	%(P	1.382E-01	3.79E-02	G K
			898.02	-3.464E-04	% P	9.411E-02	2.47E-02	G
NB-94		-5.2621E-03						
			871.10	-5.262E-03	&(	8.683E-02	2.41E-02	G K
			702.50	2.015E-02	&	7.266E-02	2.12E-02	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	1.2248E-01						
		722.95	1.225E-01	?(	8.376E-02	2.99E-02	G K
		614.37	6.023E-03	&	8.160E-02	2.30E-02	G
		433.93	1.325E-03	%	9.657E-02	2.78E-02	G
CD-109	1.1176E+00						
		88.04	1.118E+00	%(	2.623E+00	7.94E-01	G
SN-113	4.9143E-02						
		391.71	4.914E-02	%(P	9.631E-02	2.92E-02	G K
		255.04	1.027E-02	&	4.363E+00	1.28E+00	G
SB-125	1.7327E-01						
		427.95	-2.543E-02	&(	2.970E-01	8.63E-02	G K
		600.77	1.836E-01	%	3.894E-01	1.18E-01	G
		636.15	1.709E-02	%	6.171E-01	1.70E-01	G
		463.51	7.614E-01	(	7.340E-01	2.39E-01	G
		176.29	9.025E-03	%	1.116E+00	3.28E-01	G
I-131	-1.4469E-01						
		364.48	-1.447E-01	%(	1.443E+00	4.20E-01	G K
		636.97	-4.077E+00	%	1.896E+01	5.52E+00	G
		284.29	-9.457E-01	&	1.980E+01	5.79E+00	G
CS-134	5.1826E-03						
		604.66	5.183E-03	&(	2.732E-01	8.10E-02	G K
		795.76	-3.821E-03	%	1.288E-01	3.63E-02	G
		569.29	1.759E-01	%	5.189E-01	1.54E-01	G
		801.84	-1.045E-01	%	1.094E+00	3.09E-01	G
CS-137	2.6030E-01						
		661.62	2.603E-01	(	1.148E-01	4.95E-02	G
CE-139	-6.8069E-04						
		165.85	-6.807E-04	%(P	1.027E-01	3.02E-02	G
EU-152	-2.6524E-02						
		121.78	-2.652E-02	&(	2.459E-01	7.31E-02	G K
		344.30	5.107E-02	%	2.769E-01	8.15E-02	G
		1408.08	1.711E-01	%	3.972E-01	1.19E-01	G
		964.00	2.694E-01	%	8.754E-01	2.59E-01	G
		1112.07	8.131E-02	&	7.882E-01	2.20E-01	G
		778.90	-1.642E-01	%	6.069E-01	1.76E-01	G
EU-154	-2.5749E-02						
		123.10	-2.575E-02	%(	1.829E-01	5.45E-02	G K
		1274.80	-3.918E-02	%	3.698E-01	1.04E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	-1.483E-02	&	8.909E-01	2.59E-01	G
		1004.80	-1.003E-01	&	6.153E-01	1.76E-01	G
EU-155	2.5639E-01						
		86.45	2.564E-01	(	3.011E-01	9.28E-02	G K
		105.31	1.359E-01	%	3.601E-01	1.09E-01	G
HG-203	-3.1423E-02						
		279.17	-3.142E-02	&(P	1.548E-01	4.52E-02	G K
		72.87	-7.856E-01	%	3.936E+00	1.18E+00	G
		70.83	-3.109E-02	&	6.750E+00	2.01E+00	G
		82.50	-2.988E+00	%	7.601E+00	2.30E+00	G
TL-208	5.5464E-01						
		583.14	5.546E-01	(	1.137E-01	5.94E-02	G
		510.72	7.991E-01	+	3.672E-01	1.54E-01	G
PB-212	1.2298E+00						
		238.63	1.230E+00	(	1.853E-01	7.54E-02	G K
							Energy duplication
		77.11	1.665E+00	+	6.732E-01	2.20E-01	G
		74.81	2.334E+00	&	1.345E+00	4.27E-01	G
PB-214	1.0647E+00						
		351.99	1.075E+00	(	1.896E-01	8.32E-02	G K
		295.22	1.430E+00	+	3.304E-01	1.33E-01	G
							Energy duplication
		77.11	2.723E+00	+	1.101E+00	3.60E-01	G
		241.92	1.015E+00	(	1.268E+00	3.91E-01	G
BI-212	1.4986E+00						
		727.17	1.499E+00	(	9.168E-01	3.94E-01	G K
		1620.56	1.708E-02	%	3.243E+00	8.20E-01	G
		785.42	2.023E+00	%	4.379E+00	1.33E+00	G
BI-214	1.2592E+00						
		609.32	1.259E+00	(	2.062E-01	1.10E-01	G K
		1764.51	1.584E+00	+	2.780E-01	2.44E-01	G
		1120.28	1.722E+00	+	6.624E-01	2.93E-01	G
RA-224	2.6159E+00						
		241.00	2.616E+00	(	2.171E+00	6.87E-01	G
RA-226	3.3004E+00						
		185.99	3.300E+00	*(	2.055E+00	6.67E-01	G
AC-228	1.5584E+00						
		911.07	1.620E+00	(	3.794E-01	1.91E-01	G K
		968.90	2.188E+00	+	5.972E-01	3.14E-01	G
		338.40	1.410E+00	@(	5.876E-01	2.29E-01	G

Yankee Chemistry Spectrum name: 101F_4JAN2005_1825.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-4.1123E-01						
		236.00	-4.112E-01	%(	9.019E-01	2.73E-01	G K
		256.25	5.247E-02	&	1.118E+00	3.28E-01	G
PA-234	-7.5677E-02						
		98.44	-7.568E-02	%(	2.943E-01	8.82E-02	G K
		946.00	-2.623E-02	%	4.814E-01	1.34E-01	G
		131.28	-3.287E-02	&	3.663E-01	1.09E-01	G
		94.67	-1.414E-01	&	5.623E-01	1.69E-01	G
		883.24	0.000E+00	%	7.051E-01	1.92E-01	G
		926.70	-1.208E-01	%	8.304E-01	2.35E-01	G
		569.26	2.533E-01	%	7.474E-01	2.22E-01	G
TH-234	2.3528E+00						
		63.29	1.159E+00	%(	4.073E+00	1.22E+00	G K
		92.80	3.009E+00	(	2.801E+00	8.74E-01	G
		92.38	3.399E+00	&(	3.394E+00	1.05E+00	G
AM-241	-5.3574E-04						
		59.54	-5.357E-04	%(P	5.670E-01	1.68E-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

Yankee Chemistry Spectrum name: 101F_4JAN2005_1825.An1

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	-1.3389E-01	-2.0328E-01	9.1128E-01	9.1135E-01	6.876E-01
K-40		1.9402E+01	1.9402E+01	3.0382E+00	3.2300E+00	
MN-54	#A	1.4684E-02	1.5771E-02	8.0167E-02	8.0172E-02	8.731E-02
CO-57	#B	-7.2435E-03	-7.8671E-03	1.0452E-01	1.0452E-01	8.013E-02
CO-60	#B	5.0948E-03	5.1541E-03	8.2146E-02	8.2147E-02	1.087E-01
Sr-85	#A	-2.7810E-02	-3.9224E-02	1.2755E-01	1.2757E-01	1.017E-01
Kr-85	#A	-6.4202E+02	-6.4217E+02	2.0882E+03	2.0885E+03	2.347E+03
Y-88	#B	-2.2338E-02	-2.7535E-02	1.3053E-01	1.3054E-01	1.121E-01
NB-94	#B	-5.2621E-03	-5.2621E-03	7.2173E-02	7.2174E-02	8.683E-02
Ag-108M	#	1.2242E-01	1.2248E-01	8.9753E-02	9.0020E-02	8.372E-02
CD-109	#A	1.0640E+00	1.1176E+00	2.3812E+00	2.3820E+00	2.497E+00
SN-113	#B	4.0488E-02	4.9143E-02	8.7617E-02	8.7661E-02	7.934E-02
SB-125	#B	1.6949E-01	1.7327E-01	1.6307E-01	1.6337E-01	2.905E-01
I-131	#B	-9.0355E-03	-1.4469E-01	1.2597E+00	1.2597E+00	9.012E-02
CS-134	#B	5.0314E-03	5.1826E-03	2.4300E-01	2.4300E-01	2.653E-01
CS-137		2.5977E-01	2.6030E-01	1.4855E-01	1.4927E-01	
CE-139	#A	-5.7879E-04	-6.8069E-04	1.4448E-01	1.4448E-01	8.729E-02
EU-152	#B	-2.6396E-02	-2.6524E-02	2.1924E-01	2.1924E-01	2.447E-01
EU-154	#B	-2.5564E-02	-2.5749E-02	1.6343E-01	1.6343E-01	1.816E-01
EU-155	#A	2.5326E-01	2.5639E-01	2.7840E-01	2.7877E-01	2.975E-01
HG-203	#B	-1.9471E-02	-3.1423E-02	2.8276E-01	2.8276E-01	9.595E-02
TL-208		5.5464E-01	5.5464E-01	1.7832E-01	1.8106E-01	
PB-212	#	1.2298E+00	1.2298E+00	2.2632E-01	2.3674E-01	1.853E-01
PB-214	#	1.0647E+00	1.0647E+00	2.4730E-01	2.5451E-01	1.896E-01
BI-212		1.4986E+00	1.4986E+00	1.1836E+00	1.1866E+00	
BI-214		1.2592E+00	1.2592E+00	3.3073E-01	3.3830E-01	
RA-224		2.6159E+00	2.6159E+00	2.0615E+00	2.0668E+00	
RA-226	#	3.3002E+00	3.3004E+00	2.0012E+00	2.0098E+00	2.055E+00
AC-228	#	1.5584E+00	1.5584E+00	4.7009E-01	4.7827E-01	
TH-227	#B	-4.1123E-01	-4.1123E-01	8.1961E-01	8.1994E-01	9.019E-01
PA-234	#B	-7.5677E-02	-7.5677E-02	2.6456E-01	2.6460E-01	2.943E-01
TH-234	#B	2.3528E+00	2.3528E+00	2.0491E+00	2.0532E+00	4.073E+00
AM-241	#A	-5.3567E-04	-5.3574E-04	1.2674E+00	1.2674E+00	5.669E-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

Yankee Chemistry Spectrum name: 101F_4JAN2005_1825.An1

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

Total Activity (268.6 to 1999.1 keV) 2.7148760E+01 pCi/gm
Total Decayed Activity (268.6 to 1999.1 keV) 2.7149288E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_4JAN2005_1900.An1

Sample description
FSS-OOL-04-01-009-F SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_4JAN2005_1
900.An1

Acquisition information
Start time: 04-Jan-2005 18:50:52
Live time: 2000
Real time: 2002
Dead time: 0.12 %
Detector ID: 1

Detector system
Det 101- DSPE-633

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

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

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

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

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.4870E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4870E+03) =
6.7249E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_4JAN2005_1900.An1

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	03-Dec-2004 07:45:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1499

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.76	213.	14.28	1.00	1.651E-02	74.81	9.600	1.221E+00	PB212
77.05	320.	9.77	1.01	1.717E-02	77.11	17.500	9.648E-01	PB212
					77.11	10.700	1.578E+00	PB214
92.90	111.	24.09	1.02	1.994E-02	92.38	2.570	1.977E+00	TH234
					92.80	3.000	1.690E+00	TH234
185.67	134.	23.56	1.20	1.860E-02				
185.67	134.	23.56	1.20	1.860E-02	185.99	3.280	1.998E+00	RA226
238.67	625.	4.74	1.12	1.557E-02	238.63	43.100	8.456E-01	PB212
241.35	98.	21.35	1.12	1.543E-02	241.00	3.900	1.473E+00	RA224
					241.92	7.470	7.713E-01	PB214
270.12	75.	28.98	1.30	1.401E-02				
295.28	184.	11.07	1.29	1.292E-02	295.22	19.200	6.741E-01	PB214
338.03	115.	18.76	1.12	1.136E-02	338.40	12.010	7.654E-01	AC228
351.83	357.	7.95	1.29	1.093E-02	351.99	37.100	8.007E-01	PB214
462.81	27.	37.59	0.83	8.354E-03				
462.81	27.	37.59	0.83	8.354E-03	463.51	10.000	3.008E-01	SB125
510.68	57.	23.77	1.50	7.590E-03	510.72	22.500	3.033E-01	TL208
582.87	163.	11.64	1.55	6.687E-03				
582.87	163.	11.64	1.55	6.687E-03	583.14	86.000	2.574E-01	TL208
609.05	238.	7.81	1.31	6.415E-03	609.32	46.090	7.333E-01	BI214
727.06	56.	25.36	0.92	5.444E-03				
727.06	56.	25.36	0.92	5.444E-03	727.17	11.800	7.867E-01	BI212
860.28	25.	36.88	0.92	4.678E-03				
911.03	129.	13.92	1.57	4.447E-03	911.07	29.000	9.070E-01	AC228
968.69	101.	15.89	1.74	4.213E-03	968.90	17.460	1.253E+00	AC228
1460.40	608.	4.22	1.75	2.943E-03	1460.75	10.700	1.756E+01	K40

1764.31	40.	15.81	1.92	2.481E-03	1764.51	15.920	9.202E-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	
539.96	270.12	159.	75.	0.038	86.95	1.304	AC-228	
925.51	462.81	38.	27.	0.014	112.77	0.834	CS-138	l
1720.86	860.28	24.	25.	0.013	110.63	0.923	TL-208	s

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

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.19	74.81	311.	213.	0.107	40.68	1.005D
PB-212	153.79	77.11	327.	256.	0.128	32.02	1.006A
TH-234	185.55	92.99	725.	133.	0.066	89.93	1.499s
TH-234	185.52	92.97	703.	136.	0.068	86.60	1.499s
RA-226	371.63	185.99	376.	122.	0.061	72.82	1.499
PB-212	476.96	238.63	128.	625.	0.312	14.26	1.122D
RA-224	483.18	241.74	459.	80.	0.040	119.07	1.499
PB-214	483.54	241.92	141.	110.	0.055	53.93	1.124D
PB-214	590.31	295.28	110.	184.	0.092	33.21	1.286
AC-228	675.84	338.03	129.	115.	0.057	56.27	1.124
PB-214	703.46	351.83	145.	357.	0.179	23.85	1.285
TL-208	1021.31	510.68	63.	57.	0.028	71.30	1.499s
TL-208	1166.07	583.03	66.	157.	0.078	32.50	1.499
BI-214	1218.13	609.05	44.	238.	0.119	23.44	1.311
BI-212	1454.16	727.00	47.	39.	0.019	89.42	1.499s
AC-228	1822.41	911.03	49.	129.	0.064	41.76	1.572s
AC-228	1937.79	968.69	41.	101.	0.051	47.68	1.739
K-40	2921.81	1460.40	14.	608.	0.304	12.65	1.750
BI-214	3530.05	1764.31	0.	40.	0.020	47.43	1.915

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		-7.1684E-02					
			477.56	-7.168E-02	&(	8.375E-01 2.43E-01	G
K-40		1.7564E+01					
			1460.75	1.756E+01	(	5.724E-01 7.41E-01	G
MN-54		-1.1030E-02					
			834.81	-1.103E-02	&(	6.662E-02 1.91E-02	G
CO-57		-1.6954E-03					
			122.07	-1.695E-03	%(P	6.028E-02 1.78E-02	G K
			136.43	8.691E-02	%	4.948E-01 1.48E-01	G
CO-60		-1.7589E-03					
			1332.51	-1.759E-03	%(P	7.061E-02 1.74E-02	G K
			1173.23	-5.024E-03	% P	1.062E-01 2.91E-02	G K
Sr-85		-5.6163E-02					
			514.00	-5.616E-02	%(	1.055E-01 3.21E-02	G
Kr-85		-9.1661E+02					
			513.99	-9.166E+02	%(	1.722E+03 5.25E+02	G
Y-88		-1.0103E-02					
			1836.01	-1.010E-02	%(P	7.384E-02 1.93E-02	G K
			898.02	-6.703E-03	% P	7.864E-02 2.17E-02	G
NB-94		9.5922E-03					
			871.10	9.592E-03	&(	5.201E-02 1.48E-02	G K
			702.50	-7.186E-04	%	5.674E-02 1.59E-02	G K
Ag-108M		-1.4568E-02					
			722.95	-1.457E-02	&(	7.655E-02 2.23E-02	G K
			614.37	6.795E-03	&	5.523E-02 1.58E-02	G
			433.93	-4.575E-03	%	5.448E-02 1.58E-02	G
CD-109		-7.9168E-02					
			88.04	-7.917E-02	&(	1.869E+00 5.57E-01	G
SN-113		-5.5526E-03					
			391.71	-5.553E-03	%(P	9.293E-02 2.67E-02	G K
			255.04	0.000E+00	%	2.609E+00 7.62E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	5.4554E-02						
		427.95	5.455E-02	%(	1.166E-01	3.53E-02	G K
		600.77	5.438E-02	%	3.051E-01	8.86E-02	G
		636.15	-4.447E-03	&	4.827E-01	1.36E-01	G
		463.51	3.105E-01	%	4.254E-01	1.34E-01	G
		176.29	7.880E-04	%	5.824E-01	1.70E-01	G
I-131	-1.5672E-01						
		364.48	-1.567E-01	%(	9.772E-01	2.87E-01	G K
		636.97	2.716E+00	&	1.087E+01	3.17E+00	G
		284.29	-3.634E-01	&	1.281E+01	3.75E+00	G
CS-134	-4.7430E-03						
		604.66	-4.743E-03	%(	1.678E-01	4.98E-02	G K
		795.76	0.000E+00	%	8.380E-02	2.36E-02	G
		569.29	-1.929E-02	%	3.496E-01	9.97E-02	G
		801.84	1.675E-01	&	6.812E-01	1.98E-01	G
CS-137	1.7265E-02						
		661.62	1.727E-02	%(	6.466E-02	1.90E-02	G
CE-139	-1.0747E-02						
		165.85	-1.075E-02	%(P	6.835E-02	2.04E-02	G
EU-152	-1.8689E-02						
		121.78	-1.869E-02	%(	1.603E-01	4.77E-02	G K
		344.30	3.383E-02	%	1.491E-01	4.40E-02	G
		1408.08	4.051E-02	%	2.423E-01	6.63E-02	G
		964.00	2.119E-01	%	4.605E-01	1.39E-01	G
		1112.07	1.107E-01	%	5.517E-01	1.59E-01	G
		778.90	-6.737E-03	%	4.276E-01	1.19E-01	G
EU-154	-9.5830E-05						
		123.10	-9.583E-05	%(	1.215E-01	3.60E-02	G K
		1274.80	-1.297E-07	%	2.050E-01	5.58E-02	G
		723.30	-2.611E-02	%	3.464E-01	9.93E-02	G
		1004.80	0.000E+00	&	3.597E-01	9.87E-02	G
EU-155	0.0000E+00						
		86.45	0.000E+00	%(	2.167E-01	6.45E-02	G K
		105.31	5.767E-02	%	2.378E-01	7.13E-02	G
HG-203	4.1975E-03						
		279.17	4.198E-03	%(P	8.472E-02	2.45E-02	G K
		72.87	-8.535E-01	%	2.337E+00	7.06E-01	G
		70.83	9.381E-01	&	3.993E+00	1.20E+00	G
		82.50	9.338E-01	%	4.778E+00	1.43E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.5921E-01						
		583.14	2.477E-01	(	6.401E-02	2.68E-02	G
		510.72	3.033E-01	*(	2.117E-01	7.21E-02	G
PB-212	8.7999E-01						
		238.63	8.457E-01	(	7.513E-02	4.02E-02	G K
							Energy duplication
		77.11	7.724E-01	}	2.627E-01	8.25E-02	G
		74.81	1.220E+00	+	4.858E-01	1.65E-01	G
PB-214	7.7068E-01						
		351.99	8.007E-01	(	1.319E-01	6.36E-02	G K
		295.22	6.741E-01	(	1.890E-01	7.46E-02	G
							Energy duplication
		77.11	0.000E+00	}	6.263E-01	0.00E+00	G
		241.92	8.699E-01	(	4.583E-01	1.56E-01	G
BI-212	5.4539E-01						
		727.17	5.454E-01	@(	4.890E-01	1.63E-01	G K
		1620.56	7.488E-01	%	1.872E+00	5.57E-01	G
		785.42	8.106E-01	%	2.693E+00	7.91E-01	G
BI-214	7.3333E-01						
		609.32	7.333E-01	(	1.028E-01	5.73E-02	G K
		1764.51	9.202E-01	+	1.695E-01	1.45E-01	G
		1120.28	2.103E-01	%	5.342E-01	1.60E-01	G
RA-224	1.2007E+00						
		241.00	1.201E+00	(	1.547E+00	4.77E-01	G
RA-226	1.8159E+00						
		185.99	1.816E+00	(	1.388E+00	4.41E-01	G
AC-228	1.0370E+00						
		911.07	9.070E-01	@(	2.497E-01	1.26E-01	G K
		968.90	1.253E+00	(	4.004E-01	1.99E-01	G
		338.40	7.654E-01	-	3.712E-01	1.43E-01	G
TH-227	-3.0168E-01						
		236.00	-3.017E-01	%(	5.911E-01	1.80E-01	G K
		256.25	-4.005E-02	%	6.729E-01	1.98E-01	G
PA-234	1.1864E-02						
		98.44	1.186E-02	%(	2.201E-01	6.55E-02	G K
		946.00	0.000E+00	&	4.414E-01	1.25E-01	G
		131.28	0.000E+00	%	2.500E-01	7.41E-02	G
		94.67	-1.107E-03	&	3.625E-01	1.08E-01	G
		883.24	1.035E-01	%	4.482E-01	1.29E-01	G
		926.70	1.111E-01	%	4.622E-01	1.33E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-2.875E-02 %   5.036E-01 1.44E-01 G

TH-234       1.6777E+00
                           63.29 9.216E-01 %(  2.625E+00 7.92E-01 G K
                           92.80 2.072E+00  (  1.923E+00 5.98E-01 G
                           92.38 2.365E+00  (  2.284E+00 7.09E-01 G

AM-241      -3.6804E-02
                           59.54-3.680E-02 &(P 3.330E-01 9.91E-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	-4.7035E-02	-7.1684E-02	7.2889E-01	7.2890E-01	5.495E-01
K-40		1.7564E+01	1.7564E+01	2.2220E+00	2.4336E+00	
MN-54	#A	-1.0263E-02	-1.1030E-02	5.7422E-02	5.7425E-02	6.199E-02
CO-57	#B	-1.5598E-03	-1.6954E-03	1.3255E-01	1.3255E-01	5.546E-02
CO-60	#B	-1.7385E-03	-1.7589E-03	6.3226E-02	6.3226E-02	6.979E-02

Sr-85	#A	-3.9696E-02	-5.6163E-02	9.6441E-02	9.6494E-02	7.458E-02
Kr-85	#A	-9.1639E+02	-9.1661E+02	1.5740E+03	1.5748E+03	1.722E+03
Y-88	#B	-8.1803E-03	-1.0103E-02	7.3183E-02	7.3185E-02	5.979E-02
NB-94	#B	9.5922E-03	9.5922E-03	4.4456E-02	4.4460E-02	5.201E-02
Ag-108M	#B	-1.4561E-02	-1.4568E-02	6.6982E-02	6.6987E-02	7.651E-02
CD-109	#A	-7.5334E-02	-7.9168E-02	1.6718E+00	1.6718E+00	1.778E+00
SN-113	#B	-4.5666E-03	-5.5526E-03	1.7779E-01	1.7779E-01	7.642E-02
SB-125	#B	5.3354E-02	5.4554E-02	1.0600E-01	1.0604E-01	1.141E-01
I-131	#B	-9.5427E-03	-1.5672E-01	8.6112E-01	8.6117E-01	5.950E-02
CS-134	#B	-4.6034E-03	-4.7430E-03	1.4934E-01	1.4934E-01	1.629E-01
CS-137	#A	1.7230E-02	1.7265E-02	5.6931E-02	5.6939E-02	6.453E-02
CE-139	#A	-9.1247E-03	-1.0747E-02	6.2167E-02	6.2170E-02	5.803E-02
EU-152	#B	-1.8599E-02	-1.8689E-02	1.4319E-01	1.4320E-01	1.595E-01
EU-154	#B	-9.5138E-05	-9.5830E-05	1.0803E-01	1.0803E-01	1.207E-01
EU-155	#B	0.0000E+00	0.0000E+00	1.9363E-01	1.9363E-01	2.140E-01
HG-203	#B	2.5897E-03	4.1975E-03	7.3640E-02	7.3640E-02	5.227E-02
TL-208	#	2.5921E-01	2.5921E-01	8.4250E-02	8.5514E-02	6.401E-02
PB-212		8.7999E-01	8.7999E-01	1.2546E-01	1.3496E-01	
PB-214		7.7068E-01	7.7068E-01	1.7387E-01	1.7924E-01	
BI-212	#	5.4539E-01	5.4539E-01	4.8767E-01	4.8864E-01	4.890E-01
BI-214		7.3333E-01	7.3333E-01	1.7189E-01	1.7681E-01	
RA-224	#A	1.2007E+00	1.2007E+00	1.4296E+00	1.4313E+00	1.547E+00
RA-226	#	1.8159E+00	1.8159E+00	1.3224E+00	1.3264E+00	1.388E+00
AC-228		1.0370E+00	1.0370E+00	3.2866E-01	3.3384E-01	
TH-227	#B	-3.0168E-01	-3.0168E-01	5.3860E-01	5.3887E-01	5.911E-01
PA-234	#B	1.1864E-02	1.1864E-02	1.9650E-01	1.9650E-01	2.201E-01
TH-234	#B	1.6777E+00	1.6777E+00	1.4529E+00	1.4559E+00	2.625E+00
AM-241	#A	-3.6799E-02	-3.6804E-02	3.0997E-01	3.0998E-01	3.329E-01

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

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

Total Activity (269.6 to 1999.1 keV) 2.0985043E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 2.0985043E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

YAEC Chemistry Lab Spectrum name: 101F_11JAN2005_1920.An1

Sample description
Detector 101 FSS-OOL-04-01-022-F SOIL

Spectrum Filename: C:\GammaVision\Spectra\101F_11JAN2005_1920.An1

Acquisition information
Start time: 11-Jan-2005 19:12:23
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: 1.3840E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.3840E+03) =
7.2254E+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	15-Dec-2004 13:35:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2066

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.76	348.	9.47	1.00	1.654E-02	74.81	9.600	2.139E+00	PB212
75.83	175.	1.98	1.50	1.720E-02	74.81	9.600	PBC<MDA	PB212
					77.11	10.700	2.889E-01	PB214
					77.11	17.500	1.766E-01	PB212
77.06	428.	7.24	1.01	1.720E-02	77.11	17.500	1.534E+00	PB212
87.14	177.	16.71	1.01	1.920E-02	86.45	32.740	2.792E-01	EU155
89.79	119.	23.66	1.02	1.955E-02	88.04	3.790	1.660E+00	CD109
93.09	155.	18.53	1.02	1.993E-02	92.38	2.570	2.973E+00	TH234
					92.80	3.000	2.541E+00	TH234
185.98	130.	22.68	1.36	1.858E-02	185.99	3.280	2.083E+00	RA226
209.07	104.	28.80	1.03	1.723E-02				
238.66	941.	3.76	1.12	1.558E-02	238.63	43.100	1.369E+00	PB212
241.72	145.	16.59	1.12	1.541E-02	241.00	3.900	2.346E+00	RA224
					241.92	7.470	1.229E+00	PB214
269.70	114.	20.26	1.25	1.403E-02				
277.77	126.	21.28	1.57	1.366E-02				
277.77	126.	21.28	1.57	1.366E-02	279.17	81.500	1.593E-01	HG203
295.06	255.	11.47	1.21	1.293E-02	295.22	19.200	1.003E+00	PB214
300.01	63.	34.00	1.31	1.273E-02				
327.72	68.	30.87	1.18	1.171E-02				
338.14	211.	13.17	1.28	1.136E-02	338.40	12.010	1.513E+00	AC228
351.90	356.	7.58	1.17	1.093E-02	351.99	37.100	8.567E-01	PB214
462.78	48.	34.00	0.76	8.354E-03				
462.78	48.	34.00	0.76	8.354E-03	463.51	10.000	5.724E-01	SB125
510.54	122.	18.74	0.88	7.593E-03	510.72	22.500	6.986E-01	TL208
582.99	285.	7.42	1.49	6.686E-03	583.14	86.000	4.837E-01	TL208
609.08	286.	8.10	1.33	6.415E-03	609.32	46.090	9.452E-01	BI214

661.39	33.	32.20	1.50	5.937E-03	661.62	84.620	6.425E-02	CS137
727.28	84.	18.87	1.39	5.442E-03	727.17	11.800	1.283E+00	BI212
794.54	63.	22.20	0.71	5.023E-03				
794.54	63.	22.20	0.71	5.023E-03	795.76	85.400	1.463E-01	CS134
860.57	45.	27.57	1.69	4.677E-03				
910.82	167.	10.35	1.22	4.448E-03	911.07	29.000	1.265E+00	AC228
967.87	123.	15.74	1.40	4.216E-03	968.90	17.460	1.633E+00	AC228

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1120.18	43.	26.38	2.06	3.711E-03	1120.28	15.040	7.453E-01	BI214
1460.34	659.	4.06	1.98	2.943E-03	1460.75	10.700	2.044E+01	K40
1619.54	16.	25.00	1.00	2.682E-03	1620.56	2.750	2.118E+00	BI212
1764.09	44.	15.08	0.85	2.481E-03	1764.51	15.920	1.088E+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	
173.85	87.15	348.	177.	0.088	50.12	1.014	PB-214	lD
179.16	89.81	340.	119.	0.060	70.98	1.016	PB-214	lD
417.82	209.07	332.	104.	0.052	86.40	1.029	AC-228	
539.12	269.70	170.	114.	0.057	60.79	1.249	AC-228	s
555.27	277.77	201.	128.	0.064	54.04	1.575	NP-239	s
599.76	300.01	170.	63.	0.031	101.99	1.306	PB-212	
655.22	327.72	152.	68.	0.034	92.62	1.183	AC-228	s
1721.44	860.57	36.	45.	0.023	82.71	1.689	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	149.19	74.81	369.	348.	0.174	28.42	1.005D
PB-214	153.79	77.11	569.	175.	0.088	5.95	1.499A
PB-212	153.79	77.11	429.	428.	0.214	21.73	1.006A
TH-234	185.50	92.96	918.	145.	0.072	92.34	1.499
RA-226	371.61	185.98	336.	130.	0.065	68.04	1.364s
PB-212	476.96	238.63	157.	941.	0.471	11.29	1.122D
RA-224	482.62	241.46	513.	128.	0.064	79.58	1.499s
PB-214	483.54	241.92	180.	130.	0.065	51.14	1.124D
PB-214	589.87	295.06	214.	255.	0.127	34.42	1.208s
AC-228	676.07	338.14	194.	211.	0.106	39.50	1.277
PB-214	703.60	351.90	142.	356.	0.178	22.73	1.166
SB-125	925.25	462.68	87.	43.	0.022	101.87	1.499s
TL-208	1021.02	510.54	112.	122.	0.061	56.23	0.880s
TL-208	1165.98	582.99	67.	285.	0.142	22.25	1.491
BI-214	1218.19	609.08	76.	286.	0.143	24.29	1.334
CS-137	1322.87	661.39	40.	33.	0.017	96.59	1.499
BI-212	1454.71	727.28	55.	84.	0.042	56.61	1.385

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CS-134	1589.87	794.82	23.	32.	0.016	84.05	1.502s
AC-228	1821.99	910.82	44.	167.	0.083	31.06	1.220
AC-228	1936.16	967.87	63.	123.	0.062	47.23	1.397
BI-214	2240.95	1120.18	36.	43.	0.021	79.15	2.065s
K-40	2921.69	1460.34	17.	659.	0.330	12.18	1.981
BI-212	3240.31	1619.54	0.	16.	0.008	75.00	0.999s
BI-214	3529.61	1764.09	0.	44.	0.022	45.23	0.850s

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

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

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.0966E-01					
			477.56	1.097E-01	%(	7.696E-01 2.24E-01 G	
K-40		2.0443E+01					
			1460.75	2.044E+01	(	6.764E-01 8.30E-01 G	
MN-54		1.4159E-02					
			834.81	1.416E-02	%(	6.576E-02 1.90E-02 G	
CO-57		4.4862E-03					
			122.07	4.486E-03	&(P	6.289E-02 1.87E-02 G K	
			136.43	-1.322E-01	&	5.928E-01 1.78E-01 G	
CO-60		-9.0296E-03					
			1332.51	-9.030E-03	&(P	8.405E-02 2.09E-02 G K	
			1173.23	-6.057E-03	% P	1.041E-01 2.81E-02 G K	
Sr-85		-1.7236E-02					
			514.00	-1.724E-02	&(	9.896E-02 2.91E-02 G	
Kr-85		-2.9746E+02					
			513.99	-2.975E+02	&(	1.708E+03 5.03E+02 G	
Y-88		7.9985E-03					
			1836.01	7.999E-03	%(P	7.356E-02 1.92E-02 G K	
			898.02	-1.591E-02	& P	9.459E-02 2.69E-02 G	
NB-94		0.0000E+00					
			871.10	0.000E+00	%(	7.859E-02 2.21E-02 G K	
			702.50	-1.865E-02	%	7.105E-02 2.09E-02 G K	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-2.3047E-02						
		722.95	-2.305E-02	&(	9.642E-02	2.85E-02	G K
		614.37	-2.496E-03	&	3.690E-02	1.00E-02	G
		433.93	-1.548E-02	&	5.827E-02	1.72E-02	G
CD-109	-2.3523E-02						
		88.04	-2.352E-02	%(	2.191E+00	6.54E-01	G
SN-113	1.2640E-02						
		391.71	1.264E-02	%(P	9.917E-02	2.89E-02	G K
		255.04	-4.016E-02	&	3.047E+00	8.95E-01	G
SB-125	1.0322E-01						
		427.95	-3.664E-02	&(	1.989E-01	5.85E-02	G K
		600.77	-6.765E-02	%	3.880E-01	1.13E-01	G
		636.15	2.147E-01	%	4.828E-01	1.46E-01	G
		463.51	5.172E-01	@(	5.500E-01	1.76E-01	G
		176.29	3.784E-01	%	8.159E-01	2.47E-01	G
I-131	1.6881E-01						
		364.48	1.688E-01	%(	6.284E-01	1.86E-01	G K
		636.97	-1.493E+00	&	9.549E+00	2.77E+00	G
		284.29	8.464E-01	%	8.788E+00	2.58E+00	G
CS-134	2.9592E-02						
		604.66	-9.216E-03	%(	7.171E-02	2.08E-02	G K
		795.76	7.395E-02	@(	5.910E-02	2.07E-02	G
		569.29	1.634E-01	%	3.474E-01	1.05E-01	G
		801.84	8.987E-02	%	6.474E-01	1.83E-01	G
CS-137	6.4250E-02						
		661.62	6.425E-02	(	6.262E-02	2.07E-02	G
CE-139	-1.0793E-04						
		165.85	-1.079E-04	&(P	8.626E-02	2.56E-02	G
EU-152	-3.5251E-02						
		121.78	-3.525E-02	&(	1.642E-01	4.91E-02	G K
		344.30	-2.142E-02	&	2.210E-01	6.49E-02	G
		1408.08	9.805E-02	&	3.111E-01	9.05E-02	G
		964.00	-1.014E-02	%	7.684E-01	2.20E-01	G
		1112.07	2.130E-01	%	6.128E-01	1.82E-01	G
		778.90	0.000E+00	&	6.336E-01	1.80E-01	G
EU-154	-1.6957E-02						
		123.10	-1.696E-02	%(	1.441E-01	4.30E-02	G K
		1274.80	7.523E-02	%	2.523E-01	7.41E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	-1.156E-01	&	4.485E-01	1.33E-01	G
		1004.80	-4.514E-02	&	5.022E-01	1.43E-01	G
EU-155	3.3598E-03						
		86.45	3.360E-03	&(	2.470E-01	7.37E-02	G K
		105.31	7.649E-02	%	2.924E-01	8.79E-02	G
HG-203	-9.5493E-03						
		279.17	-9.549E-03	&(P	1.048E-01	3.05E-02	G K
		72.87	-1.771E+00	%	2.660E+00	8.11E-01	G
		70.83	1.171E-01	%	5.712E+00	1.71E+00	G
		82.50	-1.586E+00	%	5.231E+00	1.58E+00	G
TL-208	4.8373E-01						
		583.14	4.837E-01	(	6.949E-02	3.59E-02	G
		510.72	6.986E-01	+	2.972E-01	1.31E-01	G
PB-212	1.4170E+00						
		238.63	1.369E+00	(	8.882E-02	5.15E-02	G K
							Energy duplication
		77.11	1.390E+00	}	3.218E-01	1.01E-01	G
		74.81	2.139E+00	+	5.672E-01	2.03E-01	G
PB-214	9.2947E-01						
		351.99	8.567E-01	(	1.405E-01	6.49E-02	G K
		295.22	1.003E+00	@(	2.791E-01	1.15E-01	G
							Energy duplication
		77.11	9.295E-01	}	6.041E-01	1.84E-02	G
		241.92	1.102E+00	(	5.538E-01	1.88E-01	G
BI-212	1.2831E+00						
		727.17	1.283E+00	(	5.647E-01	2.42E-01	G K
		1620.56	2.118E+00	+	9.758E-01	5.29E-01	G
		785.42	1.653E+00	%	3.310E+00	1.01E+00	G
BI-214	9.8172E-01						
		609.32	9.452E-01	(	1.431E-01	7.65E-02	G K
		1764.51	1.088E+00	(	1.822E-01	1.64E-01	G
		1120.28	7.453E-01	-	5.393E-01	1.97E-01	G
RA-224	2.0752E+00						
		241.00	2.075E+00	?(	1.754E+00	5.51E-01	G
RA-226	2.0826E+00						
		185.99	2.083E+00	(	1.412E+00	4.72E-01	G
AC-228	1.4256E+00						
		911.07	1.265E+00	(	2.546E-01	1.31E-01	G K
		968.90	1.633E+00	(	5.270E-01	2.57E-01	G
		338.40	1.513E+00	(	4.841E-01	1.99E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-1.8233E-01						
		236.00	-1.823E-01	%(	6.262E-01	1.88E-01	G K
		256.25	-1.042E-02	%	8.323E-01	2.45E-01	G
PA-234	1.1627E-03						
		98.44	1.163E-03	%(	2.363E-01	7.02E-02	G K
		946.00	4.245E-02	%	2.763E-01	7.77E-02	G
		131.28	-5.642E-02	&	3.114E-01	9.33E-02	G
		94.67	-1.164E-01	%	4.462E-01	1.34E-01	G
		883.24	-5.737E-04	%	4.832E-01	1.32E-01	G
		926.70	-9.726E-03	%	6.878E-01	1.93E-01	G
		569.26	2.369E-01	%	5.026E-01	1.52E-01	G
TH-234	1.6953E+00						
		63.29	1.180E+00	%(	3.105E+00	9.38E-01	G K
		92.80	2.365E+00	(	2.354E+00	7.28E-01	G
		92.38	0.000E+00	%	2.781E+00	8.28E-01	G
AM-241	-1.7571E-02						
		59.54	-1.757E-02	&(P	4.364E-01	1.30E-01	G

(- This peak used in the nuclide activity average.

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

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

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

- -

***** 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	7.7005E-02	1.0966E-01	6.7195E-01	6.7198E-01	5.405E-01
K-40		2.0443E+01	2.0443E+01	2.4901E+00	2.7450E+00	
MN-54	#A	1.3328E-02	1.4159E-02	5.7009E-02	5.7015E-02	6.190E-02
CO-57	#B	4.1832E-03	4.4862E-03	5.6001E-02	5.6002E-02	5.864E-02
CO-60	#B	-8.9415E-03	-9.0296E-03	1.6595E-01	1.6595E-01	8.323E-02
Sr-85	#A	-1.2882E-02	-1.7236E-02	8.7355E-02	8.7361E-02	7.396E-02
Kr-85	#A	-2.9740E+02	-2.9746E+02	1.5076E+03	1.5077E+03	1.707E+03
Y-88	#B	6.7004E-03	7.9985E-03	5.7535E-02	5.7537E-02	6.162E-02
NB-94	#B	0.0000E+00	0.0000E+00	6.6348E-02	6.6348E-02	7.859E-02
Ag-108M	#B	-2.3037E-02	-2.3047E-02	8.5351E-02	8.5361E-02	9.638E-02
CD-109	#A	-2.2564E-02	-2.3523E-02	1.9614E+00	1.9614E+00	2.102E+00
SN-113	#B	1.0728E-02	1.2640E-02	8.6789E-02	8.6792E-02	8.417E-02
SB-125	#B	1.0132E-01	1.0322E-01	1.0515E-01	1.0532E-01	1.953E-01
I-131	#B	1.6133E-02	1.6881E-01	5.5912E-01	5.5920E-01	6.005E-02
CS-134	#B	2.8860E-02	2.9592E-02	2.4874E-02	2.4930E-02	6.994E-02
CS-137	#	6.4140E-02	6.4250E-02	6.2062E-02	6.2168E-02	6.251E-02
CE-139	#A	-9.4084E-05	-1.0793E-04	1.8730E+00	1.8730E+00	7.519E-02
EU-152	#B	-3.5108E-02	-3.5251E-02	1.4733E-01	1.4735E-01	1.636E-01
EU-154	#B	-1.6854E-02	-1.6957E-02	1.2906E-01	1.2906E-01	1.432E-01
EU-155	#B	3.3250E-03	3.3598E-03	2.2107E-01	2.2107E-01	2.444E-01
HG-203	#B	-6.3680E-03	-9.5493E-03	5.2954E-01	5.2954E-01	6.987E-02
TL-208		4.8373E-01	4.8373E-01	1.0762E-01	1.1104E-01	
PB-212		1.4170E+00	1.4170E+00	1.5997E-01	1.7889E-01	
PB-214		9.2947E-01	9.2947E-01	2.0356E-01	2.1022E-01	
BI-212		1.2831E+00	1.2831E+00	7.2638E-01	7.2999E-01	
BI-214		9.8172E-01	9.8172E-01	2.3845E-01	2.4482E-01	
RA-224	#	2.0752E+00	2.0752E+00	1.6515E+00	1.6557E+00	1.754E+00
RA-226		2.0825E+00	2.0826E+00	1.4169E+00	1.4218E+00	
AC-228		1.4256E+00	1.4256E+00	3.2770E-01	3.3746E-01	
TH-227	#B	-1.8233E-01	-1.8233E-01	5.6454E-01	5.6464E-01	6.262E-01
PA-234	#B	1.1627E-03	1.1627E-03	2.1047E-01	2.1047E-01	2.363E-01
TH-234	#B	1.6953E+00	1.6953E+00	1.5655E+00	1.5683E+00	3.105E+00
AM-241	#A	-1.7569E-02	-1.7571E-02	4.2804E-01	4.2804E-01	4.363E-01

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

H - Halflife limit exceeded

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

Total Activity (269.6 to 1999.1 keV) 2.9046612E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 2.9046677E+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_12DEC2004_1835.An1

Sample description
Detector 101 FSS-OOL-04-01-005-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\101F_12DEC2004_1835.An1

Acquisition information
Start time: 15-Dec-2004 18:30:32
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: YAEC_OperatingSpectrumRevA.Lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: wan32 G53W2.06
Start channel: 100 (50.23keV)
Stop channel: 4048 (2023.09keV)
Peak rejection level: 100.000%
Peak search sensitivity: 3
Sample Size: 1.5180E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5180E+03) =
6.5876E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	best method (based on spectrum).

YAEC Chemistry Lab Spectrum name: 101F_12DEC2004_1835.An1

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

Corrections	Status	Comments
Decay correct to date:	YES	03-Dec-2004 11:10:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

Energy Calibration
Normalized diff: 0.1330

********** 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	
174.13	87.25	204.	95.	0.048	70.51	1.014	PB-214	D
179.53	89.96	194.	73.	0.037	88.02	1.016	PB-214	D
404.14	202.22	53.	36.	0.018	98.78	1.096	U-235	D
540.30	270.29	69.	56.	0.028	80.98	1.305	AC-228	s
656.02	328.12	36.	20.	0.010	143.87	0.561	AC-228	s
925.02	462.56	29.	32.	0.016	101.50	1.096	CS-138	s

s - Peak fails shape tests.
D - Peak area deconvoluted.

This section based on library: YAEC_OperatingSpectrumRevA.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
AM-241	118.64	59.54	97.	11.	0.006	370.97	0.994D
TH-234	126.14	63.29	179.	37.	0.019	160.83	0.996D
TA-182	136.03	68.24	112.	44.	0.022	141.13	1.521s
HG-203	145.31	72.87	148.	27.	0.014	196.37	1.003D
PB-212	149.19	74.81	209.	136.	0.068	51.99	1.005D
BI-207	149.51	74.97	323.	22.	0.011	350.82	1.005D
PB-214	153.79	77.11	208.	284.	0.142	27.93	1.006D
PB-212	153.79	77.11	252.	0.	0.000	90.33	0.552D
CE-144	159.81	80.12	171.	22.	0.011	261.75	1.009D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-155	172.48	86.45	229.	0.	0.000	0.00	1.013D
NP-237	172.56	86.49	216.	13.	0.007	479.00	1.013D
CD-109	175.66	88.04	291.	17.	0.009	428.59	1.014D
TH-234	184.34	92.38	297.	0.	0.000	0.00	1.017D
TH-234	185.18	92.80	178.	112.	0.056	58.16	1.018D
NP-237	191.32	95.87	171.	13.	0.006	435.14	1.020D
Cm-243	198.69	99.55	133.	0.	0.000	0.00	0.803D
Cm-243	207.11	103.76	146.	0.	0.000	0.00	0.625D
EU-155	210.21	105.31	189.	30.	0.015	201.11	1.027D
TE-132	224.98	112.69	180.	84.	0.042	121.85	1.324s
TE-132	232.20	116.30	85.	0.	0.000	0.00	0.849D
Cm-243	234.28	117.34	176.	69.	0.034	151.43	0.718s
EU-152	243.16	121.78	133.	37.	0.019	139.23	1.038D
CO-57	243.74	122.07	171.	0.	0.000	0.00	1.039D
EU-154	245.80	123.10	119.	13.	0.007	363.46	1.039D
CE-144	266.67	133.53	89.	14.	0.007	305.44	1.047D
CO-57	272.48	136.43	118.	12.	0.006	408.56	1.049D
U-235	287.14	143.76	125.	32.	0.016	155.68	1.054D
CE-141	290.52	145.45	151.	20.	0.010	263.64	1.055D
TE-131	299.07	149.72	145.	0.	0.000	0.00	1.058D
U-235	326.34	163.35	129.	16.	0.008	304.24	1.068D
CE-139	331.34	165.85	140.	9.	0.005	550.26	1.070D
SB-125	357.00	178.68	104.	18.	0.009	250.55	0.000s
U-235	371.10	185.72	181.	149.	0.075	7.75	1.084A
RA-226	371.64	185.99	126.	0.	0.000	4771.79	1.812A
U-235	410.29	205.31	91.	7.	0.004	552.66	1.098D
TE-132	454.02	227.16	90.	40.	0.020	180.62	1.157s
TH-227	471.70	236.00	92.	37.	0.019	119.37	1.120D
PB-212	476.96	238.63	64.	475.	0.237	15.52	1.122D
RA-224	481.70	241.00	52.	51.	0.025	73.53	1.851A
PB-214	483.54	241.92	117.	47.	0.024	12.32	1.124A
SN-113	507.56	253.93	52.	28.	0.014	177.17	1.833s
TH-227	512.21	256.25	65.	0.	0.000	0.00	1.134
Cm-243	554.93	277.60	58.	28.	0.014	127.88	1.149D
HG-203	558.07	279.17	85.	0.	0.000	715.27	1.150D
J-131	565.17	282.72	65.	17.	0.009	243.46	0.497s
PB-214	590.18	295.22	70.	115.	0.058	45.31	1.252s
CR-51	640.42	320.33	34.	9.	0.005	297.21	1.213
AC-228	676.59	338.40	34.	100.	0.050	40.79	0.968
EU-152	690.69	345.45	37.	10.	0.005	305.30	0.589s
PB-214	703.70	351.95	62.	154.	0.077	34.09	1.047
J-131	730.00	365.10	14.	1.	0.001	1407.12	0.000s
SN-113	784.45	392.31	26.	6.	0.003	311.34	0.628s
SB-125	853.60	426.87	29.	22.	0.011	141.73	0.801s
Ag-108M	867.53	433.83	15.	10.	0.005	193.79	0.642s
TE-131	904.95	452.53	32.	10.	0.005	282.64	1.121
SB-125	926.92	463.51	29.	0.	0.000	0.00	1.096D
TE-131	986.26	493.17	9.	4.	0.002	355.54	0.921

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TL-208	1021.38	510.72	39.	47.	0.024	71.12	1.311D
Kr-85	1027.92	513.99	41.	1.	0.001	2177.69	1.313D
CS-134	1140.18	570.09	13.	24.	0.012	100.91	0.659s
BI-207	1139.50	569.75	22.	0.	0.000	0.00	1.351
TL-208	1165.98	582.99	20.	126.	0.063	32.25	1.374
SB-125	1201.57	600.77	12.	0.	0.000	0.00	1.372D
CS-134	1209.35	604.66	24.	1.	0.001	1647.47	1.374D
BI-214	1218.68	609.32	34.	128.	0.064	32.91	1.378D
Ag-108M	1228.78	614.37	8.	0.	0.000	0.00	0.459D
SB-125	1272.36	636.15	14.	0.	0.000	0.00	0.637D
J-131	1271.68	635.81	18.	13.	0.006	190.38	0.577s
AG-110M	1315.58	657.75	14.	5.	0.002	365.29	1.410D
CS-137	1323.33	661.62	19.	79.	0.040	41.03	1.413D
NB-94	1404.77	702.32	12.	13.	0.007	151.33	0.700s
Ag-108M	1446.05	722.95	12.	2.	0.001	732.21	1.454D
EU-154	1446.75	723.30	18.	0.	0.000	0.00	1.454D
BI-212	1454.49	727.17	20.	32.	0.016	80.38	1.457D
EU-152	1554.62	777.20	10.	13.	0.007	145.34	0.583s
BI-212	1571.76	785.77	7.	8.	0.004	175.95	1.033
CS-134	1592.47	796.12	26.	0.	0.000	0.00	1.503
CS-134	1604.00	801.88	3.	0.	0.000	0.00	0.000s
CO-58	1619.50	809.63	5.	2.	0.001	501.25	0.999s
MN-54	1669.95	834.84	7.	14.	0.007	128.83	0.652s
MN-56	1693.08	846.40	6.	2.	0.001	496.56	0.687s
NB-94	1741.32	870.51	9.	6.	0.003	277.35	0.571s
AG-110M	1765.30	882.49	13.	12.	0.006	176.70	0.763s
Y-88	1796.38	898.02	10.	3.	0.001	412.71	0.452s
AC-228	1821.73	910.69	14.	76.	0.038	43.72	1.271
AG-110M	1876.64	938.13	4.	2.	0.001	503.62	0.542s
EU-152	1928.41	964.00	24.	7.	0.004	314.88	1.612D
AC-228	1938.21	968.90	20.	60.	0.030	49.94	1.616D
EU-154	2009.33	1004.44	18.	9.	0.004	269.49	1.193
BI-207	2127.20	1063.34	12.	5.	0.002	344.67	0.956s
FE-59	2199.28	1099.36	8.	12.	0.006	150.00	0.553s
EU-152	2224.72	1112.07	14.	4.	0.002	391.71	1.708D
ZN-65	2231.62	1115.52	14.	3.	0.002	516.00	1.710D
BI-214	2241.15	1120.28	12.	18.	0.009	105.41	1.713D
TA-182	2243.15	1121.28	25.	0.	0.000	0.00	1.714D
TE-131	2295.12	1147.25	10.	6.	0.003	289.91	0.818s
CO-60	2347.34	1173.34	13.	25.	0.013	68.22	0.566s
TA-182	2374.75	1187.04	16.	10.	0.005	236.84	0.518s
TA-182	2444.00	1221.64	7.	0.	0.000	1014.89	0.000s
EU-154	2556.67	1277.94	6.	4.	0.002	374.44	0.467s
FE-59	2585.00	1292.10	5.	4.	0.002	263.12	0.000s
CO-60	2667.39	1333.27	8.	5.	0.002	112.45	0.658s
AG-110M	2770.67	1384.87	1.	0.	0.000	360.56	0.393s
EU-152	2817.62	1408.34	1.	1.	0.000	509.90	0.750s
K-40	2922.21	1460.60	8.	412.	0.206	15.23	1.553

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	3242.00	1620.38	0.	0.	0.000	335.41	0.200s
BI-214	3528.88	1763.72	0.	27.	0.014	57.74	0.874s
MN-56	3621.00	1809.75	0.	7.	0.004	113.39	1.499s
Y-88	3672.00	1835.23	1.	0.	0.000	335.41	0.200s

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 microCi	Peak Energy keV	Peak Activity microCi	Peak Code	Peak MDA Value microCi	Comments
K-40		1.7705E-02	1460.75	1.771E-02	(	6.641E-04	G
CR-51		1.0525E-04	320.07	1.052E-04	(	3.423E-04	G
MN-54		3.8442E-05	834.81	3.844E-05	@(	4.312E-05	G
MN-56		0.0000E+00	846.60	0.000E+00	%	4.017E-05	G
			1811.20	1.436E-04	&	1.512E-04	G
FE-59		6.1028E-05	1099.22	7.608E-05	@(	1.007E-04	G
			1291.56	4.135E-05	?(	1.219E-04	G
CO-57		0.0000E+00	122.07	0.000E+00	} P	4.755E-05	G
			136.43	0.000E+00	%	3.252E-04	G
CO-58		0.0000E+00	810.75	0.000E+00	&	3.617E-05	G
CO-60		5.7835E-05	1332.51	1.918E-05	(P	6.895E-05	G
			1173.23	9.654E-05	*(P	7.301E-05	G
Cm-243		1.9917E-04	277.60	1.992E-04	(	2.701E-04	G
			117.00	4.086E-04	}	3.821E-04	G
			103.76	0.000E+00	?	1.675E-04	G
			99.55	0.000E+00	!	2.609E-04	G
ZN-65		0.0000E+00	1115.52	0.000E+00	%	1.430E-04	G
Kr-85		0.0000E+00	513.99	0.000E+00	%	1.352E+00	G
Y-88		0.0000E+00	1836.01	0.000E+00	% P	4.191E-05	G
			898.02	0.000E+00	% P	5.600E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	2.3911E-05	871.10	1.655E-05	?(		4.950E-05	G
		702.50	3.127E-05	(		4.535E-05	G
Ag-108M	0.0000E+00	722.95	0.000E+00	}		5.129E-05	G
		614.37	0.000E+00	?		3.635E-05	G
		433.93	1.746E-05			3.473E-05	G
AG-110M	0.0000E+00	657.75	0.000E+00	%		4.764E-05	G
		884.67	4.741E-05	&		8.017E-05	G
		937.48	0.000E+00	%		1.110E-04	G
		1384.27	0.000E+00	%		1.326E-04	G
CD-109	0.0000E+00	88.04	0.000E+00	%		1.516E-03	G
SN-113	0.0000E+00	391.71	0.000E+00	%	P	5.636E-05	G
		255.04	1.219E-03	&		1.616E-03	G
SB-125	1.2581E-04	427.95	1.097E-04	&(		1.415E-04	G
		600.77	0.000E+00	!		2.131E-04	G
		636.15	0.000E+00	}		3.947E-04	G
		463.51	0.000E+00	&		4.528E-04	G
		176.29	2.017E-04	&(		5.629E-04	G
TE-131	0.0000E+00	149.72	0.000E+00	!		5.632E-05	G
		452.32	8.971E-05	$		2.512E-04	G
		1146.96	4.121E-04	?		1.334E-03	G
		492.66	0.000E+00	%		5.978E-04	G
TE-132	9.6808E-05	228.16	3.784E-05	&(		4.438E-05	G
		116.30	0.000E+00	}		1.499E-03	G
		111.76	2.918E-03	&(		2.266E-03	G
J-131	0.0000E+00	364.48	0.000E+00	&		3.174E-05	G
		636.97	3.829E-04	}		6.850E-04	G
		284.29	2.835E-04	&		6.717E-04	G
CS-134	0.0000E+00	604.66	0.000E+00	%		5.447E-05	G
		795.76	0.000E+00			8.351E-05	G
		569.29	3.073E-04	}		2.499E-04	G
		801.84	0.000E+00	?		3.350E-04	G
CS-137	2.1341E-04	661.62	2.134E-04	(		6.221E-05	G
CE-139	0.0000E+00	165.85	0.000E+00	%	P	4.955E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-141	2.7813E-05	145.45	2.781E-05	(	8.164E-05		G
CE-144	0.0000E+00	133.53	0.000E+00	%	2.784E-04		G
		80.12	1.030E-03		2.998E-03		G
EU-152	0.0000E+00	121.78	8.189E-05	}	1.231E-04		G
		344.30	0.000E+00	&	1.398E-04		G
		1408.08	0.000E+00	%	1.696E-04		G
		964.00	0.000E+00	%	5.588E-04		G
		1112.07	0.000E+00	%	5.316E-04		G
		778.90	2.645E-04	&	3.549E-04		G
EU-154	0.0000E+00	123.10	0.000E+00	%	8.454E-05		G
		1274.80	0.000E+00	&	1.566E-04		G
		723.30	0.000E+00	}	2.819E-04		G
		1004.80	1.631E-04	?	4.265E-04		G
EU-155	8.9785E-05	86.45	0.000E+00	}	1.583E-04		G
		105.31	8.979E-05	$(	1.989E-04		G
TA-182	1.3889E-04	67.75	1.060E-04	(	1.242E-04		G
		1121.28	0.000E+00	%	2.708E-04		G
		1221.42	0.000E+00	%	2.112E-04		G
		1189.05	2.215E-04	&(	5.045E-04		G
HG-203	0.0000E+00	279.17	0.000E+00	% P	5.560E-05		G
		72.87	3.645E-04		7.879E-04		G
TL-208	3.1180E-04	583.14	2.958E-04	(	5.556E-05		G
		510.72	3.730E-04	(	2.513E-04		G
PB-212	9.5612E-04	238.63	9.561E-04	(	8.071E-05		G
		77.11	0.000E+00	}	3.442E-04		Energy duplication
		74.81	1.156E-03	}	5.967E-04		G
PB-214	5.5310E-04	351.99	5.151E-04	(	1.309E-04		G
		295.22	6.265E-04	(	2.272E-04		G
		77.11	2.086E-03	}	5.131E-04		Energy duplication
		241.92	5.531E-04	}	6.236E-04		G
BI-207	0.0000E+00	569.67	0.000E+00	}	4.957E-05		G
		1063.62	0.000E+00	%	8.522E-05		G
		74.97	0.000E+00	}	1.824E-04		G
BI-212	7.3161E-04	727.17	6.676E-04	(	4.985E-04		G
		1620.56	0.000E+00	%	1.350E-03		G
		785.42	1.109E-03	?(	1.963E-03		G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-214	5.8392E-04	609.32	5.839E-04	(	1.372E-04		G
		1764.51	9.236E-04	+	2.521E-04		G
		1120.28	4.446E-04	-	4.505E-04		G
RA-224	1.1428E-03	241.00	1.143E-03	}(	1.713E-03		G
RA-226	0.0000E+00	185.99	0.000E+00	}	1.363E-03		G
AC-228	9.2918E-04	911.07	7.965E-04	(	2.111E-04		G
		968.90	1.103E-03	(	4.322E-04		G
		338.40	9.963E-04	(	2.982E-04		G
TH-227	2.8663E-04	236.00	2.866E-04	(	3.634E-04		G
		256.25	0.000E+00		5.456E-04		G
TH-234	1.1491E-03	63.29	1.149E-03	(	2.016E-03		G
		92.80	2.528E-03	}	1.471E-03		G
		92.38	0.000E+00	}	2.199E-03		G
U-235	2.0091E-04	185.72	2.009E-04	}	8.806E-05		G
		143.76	2.009E-04	(	3.401E-04		G
		205.31	0.000E+00	%	7.754E-04		G
		163.35	0.000E+00	%	8.052E-04		G
NP-237	0.0000E+00	86.49	0.000E+00	}	3.843E-04		G
		95.87	0.000E+00	%	1.440E-03		G
AM-241	0.0000E+00	59.54	0.000E+00	%	P 2.114E-04		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
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

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
K-40		1.1663E+01	1.1663E+01	1.7768E+00	1.8951E+00
CR-51	A	6.9334E-02	9.4337E-02	2.8038E-01	2.8043E-01
MN-54	#A	2.5324E-02	2.6026E-02	3.3529E-02	3.3561E-02
MN-56	<	2.65E-02	>12 Halflives		
FE-59	#A	4.0203E-02	4.8573E-02	7.2860E-02	7.2912E-02
CO-57	<	2.1420E-01	2.2108E-01		
CO-58	<	2.3827E-02	2.6879E-02		
CO-60	#A	3.8099E-02	3.8269E-02	3.3192E-02	3.3263E-02
Cm-243	A	1.3121E-01	1.3130E-01	1.6791E-01	1.6807E-01
ZN-65	<	9.4216E-02	9.7570E-02		
Kr-85	<	8.9072E+02	8.9080E+02		
Y-88	<	2.7611E-02	2.9912E-02		
NB-94	A	1.5752E-02	1.5752E-02	2.3837E-02	2.3853E-02
Ag-108M	<	2.3946E-02	2.3951E-02		
AG-110M	<	3.1381E-02	3.2470E-02		
CD-109	<	9.9899E-01	1.0180E+00		
SN-113	<	3.7127E-02	3.9983E-02		
SB-125	A	8.2880E-02	8.3582E-02	1.1846E-01	1.1855E-01
TE-131	<	3.71E-02	>12 Halflives		
TE-132	#	6.3773E-02	8.8283E-01	9.6175E-01	9.6305E-01
J-131	<	2.0906E-02	6.0398E-02		
CS-134	<	3.5881E-02	3.6290E-02		
CS-137		1.4059E-01	1.4069E-01	5.7723E-02	5.8268E-02
CE-139	<	3.2639E-02	3.4728E-02		
CE-141	A	1.8322E-02	2.3844E-02	6.2864E-02	6.2877E-02
CE-144	<	1.8343E-01	1.8902E-01		
EU-152	<	9.2115E-02	9.2285E-02		
EU-154	<	5.5691E-02	5.5844E-02		
EU-155	A	5.9147E-02	5.9426E-02	1.1951E-01	1.1955E-01
TA-182		9.1494E-02	9.8538E-02	1.3584E-01	1.3595E-01
HG-203	<	3.6625E-02	4.3983E-02		
TL-208		2.0540E-01	>12 Halflives	6.6241E-02	6.7250E-02
PB-212		6.2986E-01	>12 Halflives	9.7750E-02	1.0403E-01
PB-214		3.6436E-01	>12 Halflives	1.0330E-01	1.0533E-01
BI-207	<	5.6141E-02	5.6176E-02		

BI-212		4.8195E-01	>12 Halflives	3.8740E-01	3.8836E-01
BI-214		3.8466E-01	>12 Halflives	1.2660E-01	1.2845E-01
RA-224	#	7.5285E-01	7.7420E+00	6.6055E+03	5.7092E+00
AC-228		6.1211E-01	>12 Halflives	1.5896E-01	1.6268E-01
TH-227	A	1.8882E-01	2.9943E-01	3.5743E-01	3.5783E-01
TH-234	A	7.5698E-01	1.0784E+00	1.7344E+00	1.7355E+00
U-235	A	1.3235E-01	1.3235E-01	2.0604E-01	2.0617E-01
NP-237	<	9.4833E-01	9.4833E-01		
AM-241	<	1.3929E-01	1.3930E-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 2023.1 keV) 1.4270541E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 2.2558828E+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_12DEC2004_1855.An1

Sample description
Detector 101 FSS OOL-04-01-012-F

Spectrum Filename: C:\GammaVision\Spectra\101F_12DEC2004_1855.An1

Acquisition information

Start time:	21-Dec-2004 18:50:29
Live time:	2000
Real time:	2002
Dead time:	0.12 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration

Filename:	D1_1LSa.Clb

Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

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

Efficiency Calibration

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

Library Files

Main analysis library:	YAEC_OperatingSpectrumRevA.Lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters

Analysis engine:	wan32 G53W2.06
Start channel:	100 (50.23keV)
Stop channel:	4048 (2023.09keV)
Peak rejection level:	100.000%
Peak search sensitivity:	3
Sample Size:	1.7040E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.7040E+03) = 5.8685E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	best method (based on spectrum).

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

Corrections	Status	Comments
Decay correct to date:	YES	06-Dec-2004 10:56:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

Energy Calibration
Normalized diff: 0.1107

********** 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	
174.15	87.30	292.	154.	0.077	53.01	1.014	PB-214	D
179.79	90.12	361.	137.	0.068	64.19	1.016	PB-214	D
185.90	93.18	448.	137.	0.069	70.36	1.018	U-235	D
258.03	129.24	218.	51.	0.026	129.60	1.044	AC-228	D
308.10	154.23	180.	73.	0.036	115.73	0.942	XE-138	
418.21	209.25	179.	99.	0.050	64.76	1.101	AC-228	D
540.56	270.42	130.	167.	0.083	60.71	1.202	AC-228	s
600.60	300.42	94.	80.	0.040	91.30	1.067	PB-212	s
1589.61	794.53	20.	38.	0.019	70.15	1.502	AC-228	D

s - Peak fails shape tests.
D - Peak area deconvoluted.

This section based on library: YAEC_OperatingSpectrumRevA.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
AM-241	118.64	59.54	344.	20.	0.010	403.70	0.994D
TH-234	126.14	63.29	380.	57.	0.029	149.79	0.997D
TA-182	135.92	68.18	255.	12.	0.006	751.87	0.557s
HG-203	145.31	72.87	450.	50.	0.025	183.62	1.003D
PB-212	149.19	74.81	387.	357.	0.179	28.25	1.005D
BI-207	149.51	74.97	590.	0.	0.000	0.00	0.000D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PB-214	153.79	77.11	426.	536.	0.268	20.87	1.006D
PB-212	153.79	77.11	690.	0.	0.000	303.91	0.000D
CE-144	159.81	80.12	222.	0.	0.000	0.00	1.533D
EU-155	172.48	86.45	332.	0.	0.000	0.00	1.013D
NP-237	172.56	86.49	332.	0.	0.000	0.00	1.013D
CD-109	175.66	88.04	497.	0.	0.000	0.00	1.014D
TH-234	184.34	92.38	503.	84.	0.042	117.50	1.017D
TH-234	185.18	92.80	585.	0.	0.000	0.00	1.018D
NP-237	191.32	95.87	355.	0.	0.000	0.00	1.020D
Cm-243	198.69	99.55	313.	50.	0.025	156.12	1.023D
Cm-243	207.11	103.76	368.	14.	0.007	581.20	1.026D
EU-155	210.21	105.31	329.	45.	0.022	176.77	1.027D
TE-132	223.00	111.70	118.	10.	0.005	500.41	0.500s
TE-132	232.20	116.30	262.	0.	0.000	0.00	0.552D
Cm-243	232.88	116.64	262.	52.	0.026	200.71	0.552s
EU-152	243.16	121.78	196.	32.	0.016	191.74	1.039D
CO-57	243.74	122.07	225.	3.	0.001	1569.57	1.039D
EU-154	245.80	123.10	282.	37.	0.018	201.50	1.040D
CE-144	266.67	133.53	283.	0.	0.000	0.00	1.047D
CO-57	272.48	136.43	290.	31.	0.016	237.41	1.049D
U-235	287.14	143.76	295.	21.	0.010	354.71	1.055D
CE-141	290.52	145.45	257.	28.	0.014	251.39	1.056D
TE-131	299.07	149.72	295.	49.	0.024	156.32	1.059D
U-235	326.34	163.35	172.	11.	0.005	538.51	1.068D
CE-139	331.34	165.85	228.	28.	0.014	237.50	1.070D
SB-125	355.78	178.07	220.	86.	0.043	125.01	1.411s
U-235	371.10	185.72	344.	0.	0.000	0.00	1.084A
RA-226	371.64	185.99	234.	150.	0.075	49.61	1.235A
U-235	410.29	205.31	111.	7.	0.004	606.22	1.098D
TE-132	456.00	228.16	69.	0.	0.000	0.00	0.000s
TH-227	471.70	236.00	150.	16.	0.008	333.08	1.120D
PB-212	476.96	238.63	192.	878.	0.439	12.14	1.122D
RA-224	481.70	241.00	175.	59.	0.030	102.69	2.015A
PB-214	483.54	241.92	199.	111.	0.056	7.86	1.124A
SN-113	509.79	255.04	60.	0.	0.000	0.00	0.397D
TH-227	513.06	256.67	82.	4.	0.002	832.00	0.475s
Cm-243	554.93	277.60	126.	35.	0.017	145.23	1.149D
HG-203	558.07	279.17	128.	6.	0.003	448.50	1.150D
J-131	569.48	284.87	77.	30.	0.015	194.04	0.882
PB-214	590.32	295.28	150.	268.	0.134	29.99	1.108
CR-51	640.38	320.30	60.	34.	0.017	151.18	0.730s
AC-228	676.53	338.37	120.	171.	0.086	38.87	1.150
EU-152	686.48	343.34	45.	21.	0.010	202.53	0.625s
PB-214	703.73	351.97	92.	367.	0.184	20.20	1.307
J-131	728.53	364.36	42.	17.	0.009	240.03	1.162
SN-113	783.00	391.58	19.	0.	0.000	0.00	0.000s
SB-125	856.34	428.24	50.	30.	0.015	181.66	0.668s
Ag-108M	870.41	435.27	46.	20.	0.010	171.13	1.664s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TE-131	900.07	450.09	82.	17.	0.009	286.19	0.420s
SB-125	925.62	462.86	57.	40.	0.020	101.32	1.053
TE-131	984.65	492.36	26.	6.	0.003	380.79	1.340
TL-208	1021.38	510.72	84.	63.	0.031	72.38	1.311D
Kr-85	1027.92	513.99	74.	1.	0.000	4159.46	1.313D
CS-134	1139.90	569.95	25.	7.	0.004	323.56	0.297s
BI-207	1140.27	570.13	32.	0.	0.000	0.00	1.351
TL-208	1166.22	583.11	68.	248.	0.124	26.58	1.184
SB-125	1201.57	600.77	24.	2.	0.001	1225.94	1.372D
CS-134	1209.35	604.66	38.	0.	0.000	0.00	1.374D
BI-214	1218.68	609.32	35.	339.	0.170	17.86	1.378D
Ag-108M	1228.78	614.37	38.	3.	0.001	990.59	1.381D
SB-125	1272.36	636.15	30.	0.	0.000	0.00	1.396
J-131	1277.62	638.78	35.	39.	0.020	95.97	2.979s
AG-110M	1315.58	657.75	24.	3.	0.001	772.43	1.410D
CS-137	1323.33	661.62	44.	13.	0.007	228.88	1.413D
NB-94	1410.44	705.16	33.	13.	0.007	225.52	0.666s
Ag-108M	1446.05	722.95	32.	3.	0.001	822.40	1.454D
EU-154	1446.75	723.30	37.	0.	0.000	0.00	1.454D
BI-212	1454.49	727.17	30.	58.	0.029	56.50	1.457D
EU-152	1556.46	778.12	21.	8.	0.004	291.68	0.527s
BI-212	1570.00	784.89	24.	2.	0.001	894.65	0.000s
CS-134	1591.75	795.76	58.	0.	0.000	0.00	1.502D
CS-134	1603.91	801.84	20.	3.	0.002	600.19	1.506D
CO-58	1620.95	810.36	24.	14.	0.007	198.72	0.629s
MN-54	1665.74	832.74	28.	24.	0.012	133.82	0.472s
MN-56	1695.42	847.57	30.	11.	0.005	274.09	0.918s
NB-94	1739.00	869.35	12.	6.	0.003	273.86	0.167s
AG-110M	1770.22	884.95	13.	11.	0.006	167.72	0.576s
Y-88	1795.97	897.82	15.	6.	0.003	261.86	0.649s
AC-228	1822.42	911.03	37.	169.	0.085	31.24	1.340
AG-110M	1879.54	939.58	40.	14.	0.007	265.92	1.083
EU-152	1928.41	964.00	36.	26.	0.013	114.65	1.612D
AC-228	1938.21	968.90	35.	72.	0.036	49.74	1.616D
EU-154	2011.00	1005.27	7.	1.	0.001	1017.35	0.000s
BI-207	2125.64	1062.56	28.	23.	0.011	139.06	0.589s
FE-59	2201.45	1100.44	12.	8.	0.004	231.17	0.534s
EU-152	2224.72	1112.07	22.	11.	0.006	201.45	1.708D
ZN-65	2231.62	1115.52	34.	12.	0.006	231.15	1.710D
BI-214	2241.15	1120.28	24.	61.	0.030	51.55	1.713D
TA-182	2243.15	1121.28	76.	0.	0.000	0.00	1.714D
TE-131	2297.83	1148.60	20.	16.	0.008	161.86	1.538
CO-60	2344.06	1171.71	34.	2.	0.001	291.55	0.750s
TA-182	2376.99	1188.16	22.	5.	0.003	446.86	0.582s
TA-182	2440.20	1219.75	42.	17.	0.009	221.12	0.464s
EU-154	2548.34	1273.78	8.	10.	0.005	160.07	1.232s
FE-59	2582.67	1290.93	9.	6.	0.003	277.35	0.615s
CO-60	2661.24	1330.19	12.	7.	0.004	126.52	0.607s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AG-110M	2771.22	1385.15	6.	11.	0.005	146.87	0.814s
EU-152	2817.16	1408.11	5.	14.	0.007	114.43	0.811s
K-40	2922.09	1460.54	19.	642.	0.321	12.55	1.953
BI-212	3240.58	1619.68	0.	12.	0.006	86.60	1.083s
BI-214	3529.23	1763.90	2.	37.	0.019	53.17	1.182s
MN-56	3622.00	1810.25	0.	0.	0.000	0.00	0.000s
Y-88	3673.00	1835.73	0.	1.	0.000	300.00	0.500s

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 microCi	Peak Energy keV	Peak Activity microCi	Peak Code	Peak MDA Value microCi	Comments
K-40		2.7556E-02	1460.75	2.756E-02	(	9.882E-04	G
CR-51		3.9612E-04	320.07	3.961E-04	(	4.438E-04	G
MN-54		6.7039E-05	834.81	6.704E-05	&(	7.719E-05	G
MN-56		3.1640E-05	846.60	3.164E-05	&(	8.121E-05	G
			1811.20	0.000E+00	?	1.512E-04	G
FE-59		5.2170E-05	1099.22	5.072E-05	&(	1.195E-04	G
			1291.56	5.407E-05	?(	1.617E-04	G
CO-57		1.9008E-04	122.07	0.000E+00	} P	5.423E-05	G
			136.43	1.901E-04	(	4.993E-04	G
CO-58		3.8566E-05	810.75	3.857E-05	*(	7.035E-05	G
CO-60		3.0476E-05	1332.51	3.048E-05	&(P	7.932E-05	G
			1173.23	0.000E+00	& P	1.133E-04	G
Cm-243		2.3913E-04	277.60	2.477E-04	(	3.895E-04	G
			117.00	3.109E-04	}	4.631E-04	G
			103.76	0.000E+00	%	2.614E-04	G
			99.55	2.307E-04	$(	3.933E-04	G
ZN-65		8.3178E-05	1115.52	8.318E-05	(	2.147E-04	G
Kr-85		0.0000E+00	513.99	0.000E+00	%	1.784E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Y-88	0.0000E+00	1836.01	0.000E+00	% P		4.191E-05	G
		898.02	1.979E-05	? P		6.588E-05	G
NB-94	2.4398E-05	871.10	1.752E-05	&(		5.507E-05	G
		702.50	3.127E-05	&(		7.091E-05	G
Ag-108M	0.0000E+00	722.95	0.000E+00	}		7.935E-05	G
		614.37	0.000E+00	%		7.413E-05	G
		433.93	3.464E-05	&		5.827E-05	G
AG-110M	0.0000E+00	657.75	0.000E+00	%		6.127E-05	G
		884.67	4.538E-05	?		7.886E-05	G
		937.48	1.272E-04	&		2.923E-04	G
		1384.27	1.979E-04			2.541E-04	G
CD-109	0.0000E+00	88.04	0.000E+00	!		1.967E-03	G
SN-113	0.0000E+00	391.71	0.000E+00	? P		4.950E-05	G
		255.04	0.000E+00	%		1.720E-03	G
SB-125	3.7214E-04	427.95	1.518E-04	*(		1.805E-04	G
		600.77	0.000E+00	%		2.900E-04	G
		636.15	0.000E+00	}		5.531E-04	G
		463.51	6.480E-04	&(		6.139E-04	G
		176.29	9.693E-04	&(		8.058E-04	G
TE-131	1.2788E-04	149.72	4.646E-05	(		7.928E-05	G
		452.32	1.476E-04	&(		3.899E-04	G
		1146.96	1.186E-03	&(		1.771E-03	G
		492.66	0.000E+00	%		9.409E-04	G
TE-132	0.0000E+00	228.16	0.000E+00	?		3.918E-05	G
		116.30	0.000E+00	}		2.567E-03	G
		111.76	0.000E+00	%		1.856E-03	G
J-131	5.9636E-05	364.48	2.678E-05	(		5.184E-05	G
		636.97	1.179E-03	}		9.152E-04	G
		284.29	5.003E-04	&(		7.271E-04	G
CS-134	0.0000E+00	604.66	0.000E+00	!		6.739E-05	G
		795.76	0.000E+00	!		1.205E-04	G
		569.29	0.000E+00	}		3.331E-04	G
		801.84	0.000E+00	%		7.274E-04	G
CS-137	3.5401E-05	661.62	3.540E-05	(		9.028E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-139	2.3696E-05	165.85	2.370E-05	(P	6.266E-05		G
CE-141	3.7874E-05	145.45	3.787E-05	(	1.056E-04		G
CE-144	0.0000E+00	133.53	0.000E+00	!	4.829E-04		G
		80.12	0.000E+00	&	3.401E-03		G
EU-152	2.6076E-04	121.78	7.038E-05	}	1.484E-04		G
		344.30	9.417E-05	&(	1.523E-04		G
		1408.08	3.005E-04	(	2.678E-04		G
		964.00	5.677E-04	(	6.726E-04		G
		1112.07	2.942E-04	(	6.541E-04		G
		778.90	1.627E-04	&(	4.896E-04		G
EU-154	8.3471E-05	123.10	5.767E-05	(	1.280E-04		G
		1274.80	1.129E-04	&(	1.840E-04		G
		723.30	0.000E+00	}	3.895E-04		G
		1004.80	0.000E+00	%	2.830E-04		G
EU-155	1.3411E-04	86.45	0.000E+00	}	1.894E-04		G
		105.31	1.341E-04	$(	2.600E-04		G
TA-182	0.0000E+00	67.75	0.000E+00	%	1.837E-04		G
		1121.28	0.000E+00	%	4.512E-04		G
		1221.42	2.436E-04	&	4.716E-04		G
		1189.05	0.000E+00	&	5.689E-04		G
HG-203	0.0000E+00	279.17	0.000E+00	% P	6.767E-05		G
		72.87	6.688E-04		1.349E-03		G
TL-208	5.6638E-04	583.14	5.842E-04	(	9.637E-05		G
		510.72	4.984E-04	(	3.594E-04		G
PB-212	1.7669E-03	238.63	1.767E-03	(	1.353E-04		G
		77.11	0.000E+00	}	5.616E-04		Energy duplication
		74.81	3.040E-03	}	8.031E-04		G
PB-214	1.3050E-03	351.99	1.225E-03	(	1.578E-04		G
		295.22	1.460E-03	(	3.257E-04		G
		77.11	3.932E-03	}	7.263E-04		Energy duplication
		241.92	1.305E-03	}	8.034E-04		G
BI-207	1.0322E-04	569.67	0.000E+00	}	5.865E-05		G
		1063.62	1.032E-04	&(	1.240E-04		G
		74.97	0.000E+00	}	2.446E-04		G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-212	1.2148E-03	727.17	1.215E-03	(	5.964E-04		G
		1620.56	2.199E-03	+	1.350E-03		G
		785.42	0.000E+00	%	3.431E-03		G
BI-214	1.5323E-03	609.32	1.552E-03	(	1.377E-04		G
		1764.51	1.266E-03	-	3.181E-04		G
		1120.28	1.472E-03	(	6.200E-04		G
RA-224	1.3253E-03	241.00	1.325E-03	}(	2.434E-03		G
RA-226	3.3343E-03	185.99	3.334E-03	}(	1.553E-03		G
AC-228	1.7501E-03	911.07	1.773E-03	(	3.248E-04		G
		968.90	1.321E-03	-	5.571E-04		G
		338.40	1.695E-03	(	5.329E-04		G
TH-227	0.0000E+00	236.00	0.000E+00	%	4.590E-04		G
		256.25	0.000E+00	%	6.101E-04		G
TH-234	1.7718E-03	63.29	1.772E-03	(	2.895E-03		G
		92.80	0.000E+00	}	2.613E-03		G
		92.38	2.233E-03	}	2.840E-03		G
U-235	0.0000E+00	185.72	0.000E+00	}	1.200E-04		G
		143.76	0.000E+00	%	5.141E-04		G
		205.31	0.000E+00	%	8.520E-04		G
		163.35	0.000E+00	%	9.260E-04		G
NP-237	0.0000E+00	86.49	0.000E+00	}	4.732E-04		G
		95.87	0.000E+00	%	2.047E-03		G
AM-241	0.0000E+00	59.54	0.000E+00	%	P 3.886E-04		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
K-40		1.6171E+01	1.6171E+01	2.0293E+00	2.2255E+00
CR-51	#A	2.3247E-01	3.4115E-01	5.1575E-01	5.1611E-01
MN-54	#A	3.9342E-02	4.0704E-02	5.4472E-02	5.4520E-02
MN-56	#A	1.8568E-02	>12 Halflives	5.0893E-02	5.0904E-02
FE-59	A	3.0616E-02	3.8750E-02	6.9953E-02	6.9988E-02
CO-57	A	1.1155E-01	1.1603E-01	2.7546E-01	2.7554E-01
CO-58	#A	2.2633E-02	2.6299E-02	5.2261E-02	5.2282E-02
CO-60	A	1.7885E-02	1.7984E-02	4.3231E-02	4.3243E-02
Cm-243	A	1.4033E-01	1.4046E-01	1.4975E-01	1.4996E-01
ZN-65	A	4.8814E-02	5.0988E-02	1.1786E-01	1.1789E-01
Kr-85	<	1.0471E+03	1.0472E+03		
Y-88	<	2.4597E-02	2.7176E-02		
NB-94	#A	1.4318E-02	1.4318E-02	2.5398E-02	2.5411E-02
Ag-108M	<	4.3501E-02	4.3511E-02		
AG-110M	<	3.5957E-02	3.7519E-02		
CD-109	<	1.1543E+00	1.1817E+00		
SN-113	<	2.9050E-02	3.1859E-02		
SB-125		2.1839E-01	2.2070E-01	1.7853E-01	1.7896E-01
TE-131		7.5047E-02	>12 Halflives	9.1071E-02	9.1166E-02
TE-132	<	2.2992E-02	6.0704E-01		
J-131		3.4998E-02	1.3122E-01	2.0250E-01	2.0264E-01
CS-134	<	3.9546E-02	4.0107E-02		
CS-137	A	2.0775E-02	2.0796E-02	4.7597E-02	4.7611E-02
CE-139	A	1.3906E-02	1.5023E-02	3.5862E-02	3.5872E-02
CE-141	A	2.2227E-02	3.0859E-02	7.7579E-02	7.7597E-02
CE-144	<	2.8339E-01	2.9419E-01		
EU-152	C	1.5303E-01	1.5338E-01	1.3474E-01	1.3501E-01
EU-154	A	4.8985E-02	4.9153E-02	6.3246E-02	6.3305E-02
EU-155	A	7.8701E-02	7.9164E-02	1.3993E-01	1.4000E-01
TA-182	<	1.0780E-01	1.1823E-01		

HG-203	<	3.9715E-02	4.9889E-02

TL-208		3.3238E-01	>12 Halflives	8.8347E-02	9.0321E-02
PB-212		1.0369E+00	>12 Halflives	1.2585E-01	1.3882E-01
PB-214		7.6582E-01	>12 Halflives	1.3847E-01	1.4507E-01
BI-207	#A	6.0573E-02	6.0620E-02	8.4300E-02	8.4370E-02
BI-212		7.1293E-01	>12 Halflives	4.0283E-01	4.0484E-01
BI-214		8.9926E-01	>12 Halflives	1.6064E-01	1.6849E-01
RA-224	#	7.7773E-01	1.4180E+01	1.9047E+04	1.4583E+01
RA-226	#	1.9567E+00	1.9568E+00	1.1942E+03	9.7696E-01
AC-228		1.0271E+00	>12 Halflives	2.5611E-01	2.6260E-01
TH-227	<	2.6936E-01	4.7837E-01		
TH-234	A	1.0398E+00	1.6160E+00	2.4205E+00	2.4222E+00
U-235	<	3.0172E-01	3.0172E-01		
NP-237	<	1.2013E+00	1.2013E+00		
AM-241	<	2.2806E-01	2.2807E-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 2023.1 keV) 2.1254892E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 3.5470905E+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_14DEC2004_0738.An1

Sample description
FSS-OOL-04-01-003-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\101F_14DEC2004_0738.An1

Acquisition information

Start time:	14-Dec-2004 07:40:26
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:	YAEC_OperatingSpectrumRevA.Lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters

Analysis engine:	wan32 G53W2.06
Start channel:	100 (50.23keV)
Stop channel:	4048 (2023.09keV)
Peak rejection level:	100.000%
Peak search sensitivity:	3
Sample Size:	1.6870E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.6870E+03) = 5.9277E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	best method (based on spectrum).

YAEC Chemistry Lab Spectrum name: 101F_14DEC2004_0738.An1

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

Corrections	Status	Comments
Decay correct to date:	YES	06-Dec-2004 11:51:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

Energy Calibration
Normalized diff: 0.1677

********** 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	
173.61	87.05	247.	95.	0.047	76.86	1.014	PB-214	D
179.51	90.00	219.	89.	0.044	77.45	1.016	PB-214	D
418.30	209.26	112.	72.	0.036	71.65	1.101	AC-228	D
539.54	269.91	75.	77.	0.038	89.44	1.326	AC-228	s
599.37	299.80	62.	36.	0.018	106.98	1.164	TH-227	D
655.78	328.00	46.	52.	0.026	93.25	1.354	AC-228	s
817.52	408.84	35.	45.	0.023	79.67	1.024	CS-138	s

s - Peak fails shape tests.
D - Peak area deconvoluted.

This section based on library: YAEC_OperatingSpectrumRevA.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
AM-241	118.64	59.54	149.	56.	0.028	99.93	0.994D
TH-234	126.14	63.29	174.	79.	0.040	78.24	0.996D
TA-182	134.48	67.46	237.	12.	0.006	565.14	0.825
HG-203	145.31	72.87	236.	71.	0.036	98.41	1.003D
PB-212	149.19	74.81	301.	176.	0.088	47.49	1.005D
BI-207	149.51	74.97	338.	0.	0.000	0.00	0.000D
PB-214	153.79	77.11	282.	305.	0.152	29.00	1.006D
PB-212	153.79	77.11	230.	0.	0.000	43.13	0.905D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CE-144	159.81	80.12	244.	18.	0.009	372.38	1.009D
EU-155	172.48	86.45	275.	28.	0.014	253.42	1.013D
NP-237	172.56	86.49	303.	0.	0.000	0.00	1.013D
CD-109	175.66	88.04	309.	42.	0.021	185.11	1.014D
TH-234	184.34	92.38	371.	0.	0.000	0.00	1.017D
TH-234	185.18	92.80	231.	131.	0.065	55.97	1.018D
NP-237	191.32	95.87	212.	13.	0.006	490.52	1.020D
Cm-243	198.69	99.55	224.	11.	0.005	593.94	1.023D
Cm-243	207.11	103.76	224.	0.	0.000	0.00	1.026D
EU-155	210.21	105.31	214.	38.	0.019	170.58	1.027D
TE-132	223.00	111.70	82.	16.	0.008	288.22	0.500s
TE-132	232.20	116.30	125.	0.	0.000	0.00	1.386D
Cm-243	233.86	117.13	125.	36.	0.018	181.33	1.386s
EU-152	243.16	121.78	202.	0.	0.000	0.00	1.039D
CO-57	243.74	122.07	167.	35.	0.017	158.54	1.039D
EU-154	245.80	123.10	248.	5.	0.002	1396.84	1.040D
CE-144	267.65	134.02	176.	0.	0.000	0.00	1.047
CO-57	271.91	136.15	216.	43.	0.022	244.78	0.977s
U-235	287.14	143.76	161.	43.	0.021	133.46	1.054D
CE-141	290.52	145.45	167.	27.	0.013	211.79	1.055D
TE-131	299.07	149.72	213.	18.	0.009	349.14	1.058D
U-235	326.34	163.35	122.	6.	0.003	800.33	1.068D
CE-139	331.34	165.85	137.	43.	0.021	125.13	1.070D
SB-125	350.04	175.20	149.	18.	0.009	324.92	0.893
U-235	371.10	185.72	204.	209.	0.105	5.76	1.084A
RA-226	371.64	185.99	136.	0.	0.000	4947.73	1.011A
U-235	410.29	205.31	63.	19.	0.010	188.85	1.098D
TE-132	457.41	228.86	115.	34.	0.017	237.42	0.793s
TH-227	471.70	236.00	80.	16.	0.008	250.62	1.120D
PB-212	476.96	238.63	99.	570.	0.285	14.59	1.122D
RA-224	481.70	241.00	108.	43.	0.021	113.23	1.946A
PB-214	483.54	241.92	150.	62.	0.031	10.18	1.124A
SN-113	509.79	255.04	80.	0.	0.000	0.00	0.618D
TH-227	510.43	255.36	80.	30.	0.015	207.36	0.618s
Cm-243	554.93	277.60	64.	37.	0.019	102.87	1.149D
HG-203	558.07	279.17	82.	20.	0.010	159.54	1.150D
J-131	568.46	284.36	38.	40.	0.020	108.30	1.523s
PB-214	590.19	295.22	69.	133.	0.067	37.06	1.161D
CR-51	641.49	320.86	57.	18.	0.009	211.15	0.427s
AC-228	676.39	338.30	64.	102.	0.051	49.62	1.051
EU-152	686.00	343.11	32.	2.	0.001	1563.12	0.000s
PB-214	703.62	351.91	77.	219.	0.109	28.64	0.908
J-131	725.43	362.81	33.	12.	0.006	243.19	0.592s
SN-113	784.00	392.08	30.	0.	0.000	0.00	0.000s
SB-125	855.40	427.77	35.	8.	0.004	343.35	0.563s
Ag-108M	865.21	432.67	40.	14.	0.007	222.00	0.831
TE-131	903.39	451.75	35.	21.	0.011	155.17	0.713s
SB-125	925.72	462.91	27.	33.	0.017	86.43	1.099

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TE-131	984.56	492.32	11.	2.	0.001	576.58	0.640s
TL-208	1021.38	510.72	43.	52.	0.026	68.25	1.311D
Kr-85	1027.92	513.99	50.	1.	0.001	2091.04	1.313D
CS-134	1138.58	569.29	20.	0.	0.000	0.00	0.754D
BI-207	1138.26	569.13	20.	10.	0.005	219.93	0.754s
TL-208	1166.02	583.00	28.	188.	0.094	26.32	1.539s
SB-125	1201.57	600.77	29.	6.	0.003	433.67	1.372D
CS-134	1209.35	604.66	24.	11.	0.005	210.09	1.374D
BI-214	1218.68	609.32	20.	155.	0.078	27.06	1.378D
Ag-108M	1228.78	614.37	23.	0.	0.000	0.00	1.168D
SB-125	1273.58	636.76	20.	12.	0.006	191.49	0.945
J-131	1274.00	636.97	18.	0.	0.000	0.00	0.903D
AG-110M	1315.58	657.75	21.	5.	0.002	438.08	1.410D
CS-137	1323.33	661.62	27.	49.	0.025	61.40	1.413D
NB-94	1405.53	702.70	18.	15.	0.007	163.07	0.612s
Ag-108M	1446.05	722.95	18.	2.	0.001	925.83	1.454D
EU-154	1446.75	723.30	23.	0.	0.000	0.00	1.454D
BI-212	1454.49	727.17	26.	38.	0.019	74.52	1.457D
EU-152	1559.00	779.40	11.	1.	0.001	1179.16	0.000s
BI-212	1569.72	784.75	15.	10.	0.005	193.79	1.500
CS-134	1591.75	795.76	22.	19.	0.010	124.82	1.502D
CS-134	1603.91	801.84	26.	3.	0.002	726.00	1.506D
CO-58	1624.32	812.04	11.	10.	0.005	192.48	0.489s
MN-54	1670.00	834.87	7.	0.	0.000	0.00	0.000s
MN-56	1692.00	845.86	4.	2.	0.001	519.62	0.214s
NB-94	1742.00	870.85	6.	1.	0.001	994.99	0.000s
AG-110M	1768.08	883.88	10.	6.	0.003	264.13	0.577s
Y-88	1798.02	898.84	11.	7.	0.003	232.38	0.579s
AC-228	1822.00	910.82	11.	87.	0.043	37.48	1.566
AG-110M	1872.89	936.26	8.	3.	0.002	435.89	0.882s
EU-152	1928.41	964.00	20.	0.	0.000	0.00	2.205D
AC-228	1938.43	969.01	26.	49.	0.025	70.63	1.577s
EU-154	2010.00	1004.77	2.	0.	0.000	0.00	0.000s
BI-207	2126.00	1062.74	15.	5.	0.003	385.17	0.625s
FE-59	2194.83	1097.14	16.	8.	0.004	262.34	0.602s
EU-152	2224.72	1112.07	15.	0.	0.000	0.00	1.708D
ZN-65	2231.62	1115.52	25.	1.	0.000	2327.60	1.710D
BI-214	2241.15	1120.28	35.	15.	0.007	185.14	1.713D
TA-182	2243.15	1121.28	47.	0.	0.000	9020.77	1.713D
TE-131	2298.30	1148.84	15.	12.	0.006	178.56	0.725s
CO-60	2344.57	1171.96	35.	4.	0.002	278.57	0.962s
TA-182	2379.00	1189.16	5.	0.	0.000	854.40	0.000s
TA-182	2443.58	1221.44	12.	5.	0.002	344.67	0.829s
EU-154	2542.76	1271.00	21.	9.	0.004	322.66	0.526s
FE-59	2583.62	1291.41	5.	1.	0.000	927.36	0.750s
CO-60	2664.20	1331.67	10.	9.	0.004	99.23	0.583s
AG-110M	2769.00	1384.04	0.	3.	0.002	173.21	0.500s
EU-152	2816.92	1407.99	0.	16.	0.008	75.00	0.999s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
K-40	2921.82	1460.40	8.	451.	0.226	14.58	2.114
BI-212	3234.50	1616.64	0.	7.	0.004	113.39	0.999s
BI-214	3528.38	1763.47	0.	23.	0.012	62.55	2.040
MN-56	3621.00	1809.75	0.	3.	0.002	173.21	0.500s
Y-88	3672.00	1835.23	0.	0.	0.000	0.00	0.000s

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 microCi	Peak Energy keV	Peak Activity microCi	Peak Code	Peak MDA Value microCi	Comments
K-40		1.9358E-02	1460.75	1.936E-02	(	6.820E-04	G
CR-51		2.0667E-04	320.07	2.067E-04	&(	4.351E-04	G
MN-54		0.0000E+00	834.81	0.000E+00	%	4.312E-05	G
MN-56		0.0000E+00	846.60	0.000E+00	%	3.287E-05	G
			1811.20	6.154E-05	&	1.512E-04	G
FE-59		5.3888E-05	1099.22	5.389E-05	&(	1.372E-04	G
			1291.56	0.000E+00	%	1.285E-04	G
CO-57		2.6173E-04	122.07	2.610E-05	} P	4.698E-05	G
			136.43	2.617E-04	@(	4.334E-04	G
CO-58		2.7547E-05	810.75	2.755E-05	&(	5.004E-05	G
CO-60		3.7538E-05	1332.51	3.754E-05	(P	7.435E-05	G
			1173.23	0.000E+00	& P	1.148E-04	G
Cm-243		2.6483E-04	277.60	2.648E-04	(	2.822E-04	G
			117.00	2.132E-04	}	3.245E-04	G
			103.76	0.000E+00	!	2.057E-04	G
			99.55	0.000E+00	%	3.349E-04	G
ZN-65		0.0000E+00	1115.52	0.000E+00	%	1.844E-04	G
Kr-85		0.0000E+00	513.99	0.000E+00	%	1.480E+00	G
Y-88		0.0000E+00	1836.01	0.000E+00	? P	4.191E-05	G
			898.02	2.139E-05	& P	5.866E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
NB-94	0.0000E+00	871.10	0.000E+00	%	4.126E-05	G
		702.50	3.528E-05		5.452E-05	G
Ag-108M	0.0000E+00	722.95	0.000E+00	}	6.135E-05	G
		614.37	0.000E+00	!	5.925E-05	G
		433.93	2.365E-05	&	5.438E-05	G
AG-110M	0.0000E+00	657.75	0.000E+00	%	5.785E-05	G
		884.67	2.642E-05	&	7.238E-05	G
		937.48	0.000E+00	&	1.443E-04	G
		1384.27	5.396E-05	?	1.326E-04	G
CD-109	7.6847E-04	88.04	7.685E-04	(	1.562E-03	G
SN-113	0.0000E+00	391.71	0.000E+00	% P	6.076E-05	G
		255.04	0.000E+00	!	1.967E-03	G
SB-125	0.0000E+00	427.95	0.000E+00	%	1.532E-04	G
		600.77	0.000E+00	%	3.164E-04	G
		636.15	2.351E-04	}	4.614E-04	G
		463.51	5.373E-04		4.350E-04	G
		176.29	0.000E+00	&	6.685E-04	G
TE-131	0.0000E+00	149.72	0.000E+00	%	6.769E-05	G
		452.32	1.838E-04	?	2.623E-04	G
		1146.96	9.241E-04	&	1.540E-03	G
		492.66	0.000E+00	%	6.373E-04	G
TE-132	4.2527E-05	228.16	3.216E-05	&(	4.983E-05	G
		116.30	0.000E+00	}	1.799E-03	G
		111.76	5.384E-04	?(	1.564E-03	G
J-131	6.3968E-05	364.48	1.838E-05	&(	4.665E-05	G
		636.97	0.000E+00	}	6.795E-04	G
		284.29	6.754E-04	(	5.274E-04	G
CS-134	4.0612E-05	604.66	2.352E-05	(	5.477E-05	G
		795.76	6.015E-05	$(	7.740E-05	G
		569.29	0.000E+00	}	2.982E-04	G
		801.84	0.000E+00	%	8.216E-04	G
CS-137	1.3306E-04	661.62	1.331E-04	(	7.185E-05	G
CE-139	3.6473E-05	165.85	3.647E-05	(P	4.913E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-141	3.6686E-05	145.45	3.669E-05	(	8.579E-05		G
CE-144	0.0000E+00	133.53	0.000E+00		3.847E-04		G
		80.12	0.000E+00	%	3.554E-03		G
EU-152	0.0000E+00	121.78	0.000E+00	}	1.506E-04		G
		344.30	0.000E+00	&	1.313E-04		G
		1408.08	3.354E-04		1.545E-04		G
		964.00	0.000E+00	!	5.159E-04		G
		1112.07	0.000E+00	%	5.468E-04		G
		778.90	0.000E+00	%	3.671E-04		G
EU-154	0.0000E+00	123.10	0.000E+00	%	1.202E-04		G
		1274.80	0.000E+00	&	2.782E-04		G
		723.30	0.000E+00	}	3.143E-04		G
		1004.80	0.000E+00	?	1.750E-04		G
EU-155	1.1316E-04	86.45	6.150E-05	}	1.728E-04		G
		105.31	1.132E-04	$(	2.113E-04		G
TA-182	0.0000E+00	67.75	0.000E+00	%	1.773E-04		G
		1121.28	0.000E+00	%	3.597E-04		G
		1221.42	0.000E+00	%	2.701E-04		G
		1189.05	0.000E+00	%	2.979E-04		G
HG-203	9.1363E-05	279.17	2.444E-05	(P	5.474E-05		G
		72.87	9.436E-04	(	9.868E-04		G
TL-208	4.3511E-04	583.14	4.419E-04	@(	6.434E-05		G
		510.72	4.090E-04	(	2.641E-04		G
PB-212	1.1474E-03	238.63	1.147E-03	(	9.877E-05		G
		77.11	0.000E+00	}	3.294E-04		Energy duplication
		74.81	1.499E-03	}	7.109E-04		G
PB-214	7.2876E-04	351.99	7.302E-04	(	1.454E-04		G
		295.22	7.260E-04	(	2.255E-04		G
		77.11	2.239E-03	}	5.944E-04		Energy duplication
		241.92	7.288E-04	}	7.031E-04		G
BI-207	0.0000E+00	569.67	2.118E-05	}	4.699E-05		G
		1063.62	0.000E+00	&	9.292E-05		G
		74.97	0.000E+00	}	1.865E-04		G
BI-212	9.5182E-04	727.17	8.029E-04	(	5.554E-04		G
		1620.56	1.283E-03	&(	1.350E-03		G
		785.42	1.376E-03	?(	2.737E-03		G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-214	7.2969E-04	609.32	7.100E-04	(	1.087E-04		G
		1764.51	7.868E-04	(	2.521E-04		G
		1120.28	3.619E-04	-	7.337E-04		G
RA-224	9.5762E-04	241.00	9.576E-04	}(	1.888E-03		G
RA-226	0.0000E+00	185.99	0.000E+00	}	1.265E-03		G
AC-228	9.3026E-04	911.07	9.117E-04	(	1.904E-04		G
		968.90	9.065E-04	*(	4.836E-04		G
		338.40	1.010E-03	(	3.969E-04		G
TH-227	2.2941E-04	236.00	1.220E-04	(	3.410E-04		G
		256.25	4.064E-04	&(	6.013E-04		G
TH-234	2.4522E-03	63.29	2.452E-03	(	1.986E-03		G
		92.80	2.957E-03	}	1.667E-03		G
		92.38	0.000E+00	}	2.449E-03		G
U-235	2.8174E-04	185.72	2.817E-04	}	9.320E-05		G
		143.76	2.668E-04	(	3.842E-04		G
		205.31	3.151E-04	(	6.536E-04		G
		163.35	0.000E+00	%	7.852E-04		G
NP-237	0.0000E+00	86.49	0.000E+00	}	4.527E-04		G
		95.87	0.000E+00	%	1.597E-03		G
AM-241	2.4479E-04	59.54	2.448E-04	(P	2.595E-04		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
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

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

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***** 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
K-40		1.1475E+01	1.1475E+01	1.6728E+00	1.7941E+00
CR-51	#A	1.2251E-01	1.4901E-01	3.1463E-01	3.1474E-01
MN-54	<	2.5560E-02	2.6008E-02		
MN-56	<	1.95E-02	>12 Halflives		
FE-59	#A	3.1943E-02	3.6026E-02	9.4511E-02	9.4533E-02
CO-57	A	1.5514E-01	1.5829E-01	3.8747E-01	3.8757E-01
CO-58	A	1.6329E-02	1.7630E-02	3.3935E-02	3.3949E-02
CO-60	A	2.2251E-02	2.2314E-02	3.8319E-02	3.8340E-02
Cm-243	A	1.5698E-01	1.5706E-01	1.6156E-01	1.6181E-01
ZN-65	<	1.0933E-01	1.1179E-01		
Kr-85	<	8.7705E+02	8.7710E+02		
Y-88	<	2.4845E-02	2.6142E-02		
NB-94	<	2.4455E-02	2.4455E-02		
Ag-108M	<	3.5123E-02	3.5128E-02		
AG-110M	<	3.4291E-02	3.5044E-02		
CD-109	A	4.5552E-01	4.6101E-01	8.5335E-01	8.5374E-01
SN-113	<	3.6016E-02	3.7754E-02		
SB-125	<	9.0839E-02	9.1327E-02		
TE-131	<	4.01E-02	>12 Halflives		
TE-132	#A	2.5209E-02	1.3407E-01	2.5031E-01	2.5043E-01
J-131	C	3.7918E-02	7.4451E-02	8.0628E-02	8.0738E-02
CS-134	A	2.4073E-02	2.4247E-02	2.9627E-02	2.9659E-02
CS-137		7.8872E-02	7.8911E-02	4.8455E-02	4.8660E-02
CE-139	A	2.1620E-02	2.2490E-02	2.8234E-02	2.8263E-02
CE-141	A	2.1746E-02	2.5712E-02	5.4457E-02	5.4476E-02
CE-144	<	2.2804E-01	2.3244E-01		
EU-152	<	7.7818E-02	7.7909E-02		
EU-154	<	7.1265E-02	7.1390E-02		
EU-155	A	6.7075E-02	6.7277E-02	1.1476E-01	1.1482E-01
TA-182	<	1.0507E-01	1.1015E-01		
HG-203	C	5.4157E-02	6.0844E-02	5.9877E-02	5.9976E-02
TL-208		2.5792E-01	>12 Halflives	6.7878E-02	6.9425E-02
PB-212		6.8012E-01	>12 Halflives	9.9201E-02	1.0638E-01
PB-214		4.3199E-01	>12 Halflives	1.0117E-01	1.0407E-01
BI-207	<	5.5082E-02	5.5104E-02		

BI-212		5.6421E-01	>12 Halflives	4.2043E-01	4.2164E-01
BI-214		4.3254E-01	>12 Halflives	1.1704E-01	1.1957E-01
RA-224	#	5.6765E-01	2.4989E+00	3.6579E+03	2.8331E+00
AC-228		5.5143E-01	>12 Halflives	1.7297E-01	1.7575E-01
TH-227	A	1.3599E-01	1.8232E-01	2.9653E-01	2.9671E-01
TH-234		1.4536E+00	1.8205E+00	1.4243E+00	1.4279E+00
U-235	A	1.6701E-01	1.6701E-01	1.9310E-01	1.9332E-01
NP-237	<	9.4644E-01	9.4644E-01		
AM-241	A	1.4510E-01	1.4511E-01	1.4568E-01	1.4590E-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 2023.1 keV) 1.5235208E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 1.7777746E+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_14DEC2004_1600.An1

Sample description
Detector 101 FSS-OOL-04-01-001-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\101F_14DEC2004_1600.An1

Acquisition information

Start time:	14-Dec-2004 15:53:49
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:	YAEC_OperatingSpectrumRevA.Lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters

Analysis engine:	wan32 G53W2.06
Start channel:	100 (50.23keV)
Stop channel:	4048 (2023.09keV)
Peak rejection level:	100.000%
Peak search sensitivity:	3
Sample Size:	1.9000E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.9000E+03) = 5.2632E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	best method (based on spectrum).

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

Corrections	Status	Comments
Decay correct to date:	YES	06-Dec-2004 13:55:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

Energy Calibration
Normalized diff: 0.1486

********** 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	
167.69	84.10	272.	69.	0.035	107.39	1.011	TA-182	D
173.75	87.13	307.	102.	0.051	78.44	1.014	PB-214	D
179.32	89.91	259.	81.	0.040	90.74	1.016	PB-214	D
418.52	209.71	136.	77.	0.038	72.94	1.101	NP-239	D
539.70	269.99	92.	63.	0.032	108.90	1.216	AC-228	s
601.09	300.67	85.	57.	0.029	125.33	0.976	PB-212	s
654.07	327.15	44.	89.	0.045	65.28	1.146	AC-228	s

s - Peak fails shape tests.
D - Peak area deconvoluted.

This section based on library: YAEC_OperatingSpectrumRevA.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
AM-241	118.64	59.54	238.	17.	0.008	395.95	0.994D
TH-234	126.14	63.29	177.	69.	0.035	88.85	0.996D
TA-182	134.48	67.46	163.	8.	0.004	654.65	0.397s
HG-203	145.31	72.87	374.	26.	0.013	315.67	1.003D
PB-212	149.19	74.81	336.	200.	0.100	44.31	1.005D
BI-207	149.51	74.97	274.	0.	0.000	0.00	0.728D
PB-214	153.79	77.11	337.	318.	0.159	29.77	1.006D
PB-212	153.79	77.11	555.	0.	0.000	2830.19	0.000D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CE-144	159.81	80.12	120.	0.	0.000	0.00	0.640D
EU-155	172.48	86.45	392.	17.	0.009	487.55	1.013D
NP-237	172.56	86.49	409.	0.	0.000	0.00	1.013D
CD-109	175.66	88.04	383.	34.	0.017	247.04	1.014D
TH-234	184.34	92.38	385.	39.	0.019	219.31	1.017D
TH-234	185.18	92.80	318.	104.	0.052	78.10	1.018D
NP-237	191.32	95.87	258.	35.	0.017	204.11	1.020D
Cm-243	198.69	99.55	213.	26.	0.013	249.28	1.023D
Cm-243	207.11	103.76	259.	28.	0.014	253.46	1.026D
EU-155	210.21	105.31	216.	61.	0.031	108.31	1.027D
TE-132	223.00	111.70	76.	24.	0.012	179.86	0.500s
TE-132	232.20	116.30	242.	16.	0.008	431.43	1.035D
Cm-243	233.60	117.00	241.	9.	0.005	719.66	1.035D
EU-152	243.16	121.78	135.	5.	0.003	921.20	1.038D
CO-57	243.74	122.07	134.	6.	0.003	651.16	1.039D
EU-154	245.80	123.10	130.	10.	0.005	493.21	1.039D
CE-144	266.67	133.53	157.	18.	0.009	308.73	1.047D
CO-57	272.48	136.43	201.	16.	0.008	379.26	1.049D
U-235	287.14	143.76	172.	1.	0.001	4207.33	1.054D
CE-141	290.52	145.45	225.	7.	0.003	926.98	1.055D
TE-131	299.07	149.72	244.	17.	0.008	404.70	1.058D
U-235	326.34	163.35	141.	1.	0.000	7800.05	1.068D
CE-139	331.34	165.85	188.	15.	0.007	397.82	1.070D
SB-125	354.01	177.18	98.	34.	0.017	173.36	0.657s
U-235	371.10	185.72	239.	0.	0.000	0.00	1.084A
RA-226	371.64	185.99	152.	95.	0.048	62.95	1.660A
U-235	410.29	205.31	105.	17.	0.009	263.53	1.098D
TE-132	456.74	228.52	66.	14.	0.007	312.00	0.543s
TH-227	471.70	236.00	167.	15.	0.008	365.63	1.120D
PB-212	476.96	238.63	120.	653.	0.327	13.73	1.121D
RA-224	481.70	241.00	148.	49.	0.025	113.17	0.740A
PB-214	483.54	241.92	159.	63.	0.031	11.40	1.124A
SN-113	509.79	255.04	57.	21.	0.010	169.24	1.133D
TH-227	512.21	256.25	91.	17.	0.009	244.18	1.134D
Cm-243	554.93	277.60	66.	29.	0.015	131.01	1.149D
HG-203	558.07	279.17	84.	0.	0.000	0.00	1.150D
J-131	566.97	283.62	42.	16.	0.008	248.05	0.670s
PB-214	590.01	295.13	108.	144.	0.072	44.26	0.878
CR-51	639.00	319.62	19.	0.	0.000	0.00	0.000s
AC-228	676.21	338.21	50.	139.	0.069	35.62	1.120
EU-152	687.62	343.92	45.	24.	0.012	205.97	2.103s
PB-214	703.53	351.87	76.	214.	0.107	28.17	0.978
J-131	728.00	364.10	28.	3.	0.001	831.37	0.000s
SN-113	784.25	392.21	34.	2.	0.001	830.66	0.619s
SB-125	854.72	427.43	52.	20.	0.010	188.89	1.271s
Ag-108M	866.00	433.07	16.	4.	0.002	443.32	0.241s
TE-131	901.10	450.61	40.	17.	0.009	196.25	0.682s
SB-125	926.55	463.33	42.	40.	0.020	96.63	0.844

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TE-131	980.69	490.39	33.	19.	0.009	166.68	0.520s
TL-208	1021.38	510.72	61.	70.	0.035	59.82	1.311D
Kr-85	1027.92	513.99	43.	2.	0.001	1701.57	1.313D
CS-134	1142.36	571.18	23.	8.	0.004	281.68	0.507s
BI-207	1139.34	569.67	41.	0.	0.000	0.00	1.351
TL-208	1166.24	583.12	46.	158.	0.079	33.08	1.251
SB-125	1201.57	600.77	26.	14.	0.007	177.02	1.372D
CS-134	1209.35	604.66	29.	15.	0.007	176.92	1.374D
BI-214	1218.68	609.32	19.	192.	0.096	23.73	1.378D
Ag-108M	1228.78	614.37	21.	0.	0.000	0.00	0.473D
SB-125	1272.44	636.19	28.	20.	0.010	157.94	0.876s
J-131	1274.00	636.97	17.	0.	0.000	0.00	1.630D
AG-110M	1315.58	657.75	23.	5.	0.002	441.60	1.410D
CS-137	1323.33	661.62	29.	95.	0.047	39.10	1.413D
NB-94	1405.68	702.77	15.	13.	0.007	168.00	0.565s
Ag-108M	1446.05	722.95	30.	1.	0.000	2428.51	1.454D
EU-154	1446.75	723.30	28.	4.	0.002	583.05	1.454D
BI-212	1454.49	727.17	16.	34.	0.017	72.77	1.457D
EU-152	1553.52	776.66	28.	13.	0.006	236.12	0.459s
BI-212	1570.99	785.39	24.	22.	0.011	143.02	0.693s
CS-134	1591.50	795.64	13.	3.	0.002	444.97	0.646s
CS-134	1603.91	801.84	31.	0.	0.000	0.00	1.506
CO-58	1620.67	810.21	5.	1.	0.001	679.15	0.875s
MN-54	1673.00	836.37	15.	6.	0.003	301.66	0.631s
MN-56	1691.08	845.40	18.	13.	0.007	188.89	0.503s
NB-94	1742.50	871.10	2.	0.	0.000	0.00	0.583s
AG-110M	1768.92	884.30	7.	4.	0.002	281.69	0.467s
Y-88	1795.00	897.33	5.	0.	0.000	0.00	0.167s
AC-228	1822.11	910.88	16.	126.	0.063	32.36	1.928s
AG-110M	1875.00	937.31	8.	1.	0.000	1197.91	0.562s
EU-152	1928.41	964.00	30.	32.	0.016	88.35	1.612D
AC-228	1938.21	968.90	25.	69.	0.034	47.45	1.616D
EU-154	2010.98	1005.26	5.	8.	0.004	173.21	0.546s
BI-207	2128.67	1064.07	4.	0.	0.000	0.00	0.467s
FE-59	2197.00	1098.22	10.	4.	0.002	367.42	0.000s
EU-152	2224.72	1112.07	22.	6.	0.003	333.88	1.708D
ZN-65	2231.62	1115.52	21.	8.	0.004	269.63	1.710D
BI-214	2241.15	1120.28	24.	16.	0.008	147.12	1.713D
TA-182	2243.15	1121.28	37.	0.	0.000	0.00	1.713D
TE-131	2295.00	1147.19	6.	1.	0.001	994.99	0.000s
CO-60	2346.59	1172.97	20.	2.	0.001	229.41	1.414s
TA-182	2376.21	1187.77	5.	4.	0.002	263.12	0.888s
TA-182	2447.00	1223.14	20.	12.	0.006	210.55	0.458s
EU-154	2548.33	1273.78	10.	8.	0.004	231.17	1.268
FE-59	2583.73	1291.47	8.	8.	0.004	204.94	0.801s
CO-60	2664.97	1332.06	12.	14.	0.007	92.47	0.623s
AG-110M	2768.37	1383.73	1.	4.	0.002	213.01	0.440s
EU-152	2816.25	1407.65	0.	8.	0.004	106.07	1.249s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
K-40	2921.77	1460.38	17.	478.	0.239	14.63	1.925
BI-212	3243.67	1621.22	0.	3.	0.002	173.21	0.750s
BI-214	3530.58	1764.57	0.	19.	0.009	68.82	1.874
MN-56	3622.00	1810.25	0.	2.	0.001	212.13	0.500s
Y-88	3674.20	1836.33	0.	5.	0.002	134.16	0.749s

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 microCi	Peak Energy keV	Peak Activity microCi	Peak Code	Peak MDA Value microCi	Comments
K-40		2.0516E-02	1460.75	2.052E-02	(	9.410E-04	G
CR-51		0.0000E+00	320.07	0.000E+00	?	2.643E-04	G
MN-54		0.0000E+00	834.81	0.000E+00	&	5.782E-05	G
MN-56		3.8176E-05	846.60	3.739E-05	&(	6.466E-05	G
			1811.20	4.103E-05	?(	1.512E-04	G
FE-59		0.0000E+00	1099.22	0.000E+00	&	1.106E-04	G
			1291.56	7.156E-05		1.476E-04	G
CO-57		0.0000E+00	122.07	0.000E+00	} P	4.224E-05	G
			136.43	0.000E+00	%	4.185E-04	G
CO-58		0.0000E+00	810.75	0.000E+00	%	3.520E-05	G
CO-60		5.7309E-05	1332.51	5.731E-05	(P	8.121E-05	G
			1173.23	0.000E+00	% P	9.020E-05	G
Cm-243		1.6146E-04	277.60	2.056E-04	(	2.871E-04	G
			117.00	0.000E+00	}	4.442E-04	G
			103.76	7.854E-05	-	2.207E-04	G
			99.55	1.183E-04	(	3.271E-04	G
ZN-65		5.6314E-05	1115.52	5.631E-05	(	1.725E-04	G
Kr-85		0.0000E+00	513.99	0.000E+00	%	1.391E+00	G
Y-88		2.7033E-05	1836.01	2.703E-05	?(P	4.191E-05	G
			898.02	0.000E+00	? P	4.124E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	0.0000E+00	871.10	0.000E+00	?		2.716E-05	G
		702.50	3.127E-05	?		4.993E-05	G
Ag-108M	0.0000E+00	722.95	0.000E+00	}		7.709E-05	G
		614.37	0.000E+00	?		5.654E-05	G
		433.93	0.000E+00	&		3.558E-05	G
AG-110M	0.0000E+00	657.75	0.000E+00	%		6.004E-05	G
		884.67	1.761E-05	?		5.991E-05	G
		937.48	0.000E+00	%		1.468E-04	G
		1384.27	6.595E-05	?		1.455E-04	G
CD-109	6.3365E-04	88.04	6.336E-04	(		1.732E-03	G
SN-113	0.0000E+00	391.71	0.000E+00	%	P	6.412E-05	G
		255.04	9.141E-04			1.684E-03	G
SB-125	2.2759E-04	427.95	9.869E-05	*(		1.846E-04	G
		600.77	1.558E-04	(		3.002E-04	G
		636.15	3.886E-04	}		5.376E-04	G
		463.51	6.480E-04	?(		5.331E-04	G
		176.29	3.754E-04	&(		5.460E-04	G
TE-131	0.0000E+00	149.72	0.000E+00	%		7.233E-05	G
		452.32	1.476E-04	&		2.794E-04	G
		1146.96	0.000E+00	%		1.058E-03	G
		492.66	6.635E-04	&		1.053E-03	G
TE-132	0.0000E+00	228.16	0.000E+00	%		3.837E-05	G
		116.30	0.000E+00	}		2.470E-03	G
		111.76	8.510E-04	?		1.510E-03	G
J-131	0.0000E+00	364.48	0.000E+00	%		4.334E-05	G
		636.97	0.000E+00	}		6.627E-04	G
		284.29	2.585E-04	&		5.518E-04	G
CS-134	3.1154E-05	604.66	3.115E-05	(		6.003E-05	G
		795.76	0.000E+00	%		6.087E-05	G
		569.29	1.067E-04	}		3.188E-04	G
		801.84	0.000E+00			8.945E-04	G
CS-137	2.5530E-04	661.62	2.553E-04	(		7.488E-05	G
CE-139	0.0000E+00	165.85	0.000E+00	%	P	5.710E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-141	0.0000E+00	145.45	0.000E+00	%		9.898E-05	G
CE-144	0.0000E+00	133.53	0.000E+00	%		3.641E-04	G
		80.12	0.000E+00	&		2.531E-03	G
EU-152	2.6694E-04	121.78	0.000E+00	}		1.241E-04	G
		344.30	1.076E-04	*(		1.523E-04	G
		1408.08	1.677E-04	?(		1.545E-04	G
		964.00	7.116E-04	(		6.140E-04	G
		1112.07	0.000E+00	%		6.502E-04	G
		778.90	2.611E-04	&(		5.582E-04	G
EU-154	0.0000E+00	123.10	0.000E+00	%		8.819E-05	G
		1274.80	9.183E-05	&		2.003E-04	G
		723.30	0.000E+00	}		3.433E-04	G
		1004.80	1.506E-04	?		2.471E-04	G
EU-155	1.8320E-04	86.45	0.000E+00	}		2.052E-04	G
		105.31	1.832E-04	(		2.120E-04	G
TA-182	0.0000E+00	67.75	0.000E+00	%		1.483E-04	G
		1121.28	0.000E+00	%		3.234E-04	G
		1221.42	1.696E-04	&		3.387E-04	G
		1189.05	1.010E-04	&		2.979E-04	G
HG-203	0.0000E+00	279.17	0.000E+00	%	P	5.544E-05	G
		72.87	0.000E+00	%		1.232E-03	G
TL-208	3.7024E-04	583.14	3.702E-04	(		8.026E-05	G
		510.72	5.505E-04	+		3.104E-04	G
PB-212	1.3146E-03	238.63	1.315E-03	(		1.082E-04	G
		77.11	0.000E+00	}		5.049E-04	Energy duplication
		74.81	1.702E-03	}		7.501E-04	G
PB-214	7.3849E-04	351.99	7.152E-04	(		1.449E-04	G
		295.22	7.835E-04	(		2.788E-04	G
		77.11	2.331E-03	}		6.484E-04	Energy duplication
		241.92	7.385E-04	}		7.227E-04	G
BI-207	0.0000E+00	569.67	0.000E+00	}		6.567E-05	G
		1063.62	0.000E+00	?		5.438E-05	G
		74.97	0.000E+00	}		1.685E-04	G
BI-212	6.7712E-04	727.17	7.068E-04	(		4.542E-04	G
		1620.56	5.497E-04	?(		1.350E-03	G
		785.42	2.929E-03	+		3.400E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-214	8.7826E-04	609.32	8.783E-04	(	1.061E-04		G
		1764.51	6.500E-04	-	2.521E-04		G
		1120.28	3.941E-04	-	6.152E-04		G
RA-224	1.1048E-03	241.00	1.105E-03	}(	1.977E-03		G
RA-226	2.1113E-03	185.99	2.111E-03	}(	1.624E-03		G
AC-228	1.3165E-03	911.07	1.320E-03	(	2.237E-04		G
		968.90	1.267E-03	(	4.781E-04		G
		338.40	1.378E-03	(	3.535E-04		G
TH-227	0.0000E+00	236.00	0.000E+00	%	4.827E-04		G
		256.25	2.346E-04		6.378E-04		G
TH-234	2.1486E-03	63.29	2.149E-03	(	2.001E-03		G
		92.80	2.365E-03	}	1.942E-03		G
		92.38	1.031E-03	}	2.494E-03		G
U-235	0.0000E+00	185.72	0.000E+00	}	1.005E-04		G
		143.76	0.000E+00	%	3.961E-04		G
		205.31	2.825E-04		8.310E-04		G
		163.35	0.000E+00	%	8.420E-04		G
NP-237	7.8064E-04	86.49	0.000E+00	}	5.236E-04		G
		95.87	7.806E-04	(	1.756E-03		G
AM-241	0.0000E+00	59.54	0.000E+00	%	P	3.253E-04	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
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

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
K-40		1.0798E+01	1.0798E+01	1.5795E+00	1.6932E+00
CR-51	<	1.3913E-01	1.7031E-01		
MN-54	<	3.0433E-02	3.0984E-02		
MN-56	A	2.0093E-02	>12 Halflives	2.8536E-02	2.8558E-02
FE-59	<	5.8213E-02	6.5913E-02		
CO-57	<	2.2024E-01	2.2486E-01		
CO-58	<	1.8524E-02	2.0050E-02		
CO-60	A	3.0163E-02	3.0251E-02	4.1358E-02	4.1393E-02
Cm-243	A	8.4981E-02	8.5022E-02	1.1139E-01	1.1149E-01
ZN-65	A	2.9639E-02	3.0328E-02	8.1774E-02	8.1792E-02
Kr-85	<	7.3209E+02	7.3214E+02		
Y-88	#A	1.4228E-02	1.4995E-02	2.1163E-02	2.1180E-02
NB-94	<	1.4297E-02	1.4297E-02		
Ag-108M	<	2.9758E-02	2.9761E-02		
AG-110M	<	3.1598E-02	3.2314E-02		
CD-109	A	3.3350E-01	3.3765E-01	8.3411E-01	8.3432E-01
SN-113	<	3.3750E-02	3.5433E-02		
SB-125		1.1978E-01	1.2045E-01	9.8225E-02	9.8461E-02
TE-131	<	3.81E-02	>12 Halflives		
TE-132	<	2.0197E-02	1.1346E-01		
J-131	<	2.2812E-02	4.5792E-02		
CS-134	A	1.6397E-02	1.6519E-02	2.9227E-02	2.9242E-02
CS-137		1.3437E-01	1.3444E-01	5.2570E-02	5.3116E-02
CE-139	<	3.0054E-02	3.1304E-02		
CE-141	<	5.2096E-02	6.1937E-02		
CE-144	<	1.9164E-01	1.9545E-01		
EU-152	C	1.4050E-01	1.4067E-01	1.2041E-01	1.2067E-01
EU-154	<	4.6418E-02	4.6502E-02		
EU-155	A	9.6421E-02	9.6720E-02	1.0475E-01	1.0489E-01
TA-182	<	7.8051E-02	8.1948E-02		
HG-203	<	2.9179E-02	3.2907E-02		
TL-208		1.9486E-01	>12 Halflives	6.4458E-02	6.5391E-02
PB-212		6.9189E-01	>12 Halflives	9.4982E-02	1.0271E-01
PB-214		3.8868E-01	>12 Halflives	1.0196E-01	1.0430E-01
BI-207	<	2.8621E-02	2.8633E-02		

BI-212		3.5638E-01	>12 Halflives	2.5935E-01	2.6013E-01
BI-214		4.6224E-01	>12 Halflives	1.0967E-01	1.1274E-01
RA-224	#	5.8146E-01	2.6872E+00	3.9821E+03	3.0448E+00
RA-226	#	1.1112E+00	1.1112E+00	8.6320E+02	7.0228E-01
AC-228		6.9287E-01	>12 Halflives	1.5607E-01	1.6091E-01
TH-227	<	2.5406E-01	3.4392E-01		
TH-234		1.1308E+00	1.4268E+00	1.2677E+00	1.2702E+00
U-235	<	2.0849E-01	2.0849E-01		
NP-237	A	4.1087E-01	4.1087E-01	8.3863E-01	8.3894E-01
AM-241	<	1.7120E-01	1.7121E-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 2023.1 keV) 1.5032450E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 1.7441187E+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_14DEC2004_1630.An1

Sample description
Detector 101 FSS-OOL-04-01-014-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\101F_14DEC2004_1630.An1

Acquisition information

Start time:	14-Dec-2004 18:21:55
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:	YAEC_OperatingSpectrumRevA.Lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters

Analysis engine:	wan32 G53W2.06
Start channel:	100 (50.23keV)
Stop channel:	4048 (2023.09keV)
Peak rejection level:	100.000%
Peak search sensitivity:	3
Sample Size:	1.9600E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.9600E+03) = 5.1020E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	best method (based on spectrum).

YAEC Chemistry Lab Spectrum name: 101F_14DEC2004_1630.An1

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

Corrections	Status	Comments
Decay correct to date:	YES	06-Dec-2004 11:31:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

Energy Calibration
Normalized diff: 0.1113

********** 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	
174.16	87.21	237.	85.	0.042	83.56	1.014	PB-214	D
179.12	89.69	269.	61.	0.030	121.35	1.016	PB-214	D
257.38	128.88	178.	68.	0.034	131.15	1.769	AC-228	s
394.05	197.19	70.	42.	0.021	121.01	1.244	TB-160	M
417.68	209.00	130.	72.	0.036	116.32	0.890	AC-228	s
538.67	269.47	94.	90.	0.045	88.51	1.779	AC-228	s
600.22	300.24	45.	67.	0.034	70.37	1.587	PB-212	s
817.96	409.06	50.	34.	0.017	114.95	1.188	CS-138	
925.17	462.64	50.	45.	0.023	94.63	1.017	CS-138	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
M - Peak is close to a library peak.

This section based on library: YAEC_OperatingSpectrumRevA.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
AM-241	118.64	59.54	228.	37.	0.019	177.56	0.994D
TH-234	126.14	63.29	211.	71.	0.035	93.96	0.996D
TA-182	134.09	67.26	239.	20.	0.010	350.86	0.512s
HG-203	145.31	72.87	273.	25.	0.013	286.62	1.003D
PB-212	149.19	74.81	280.	206.	0.103	40.23	1.005D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-207	149.51	74.97	382.	0.	0.000	0.00	0.000D
PB-214	153.79	77.11	287.	318.	0.159	28.16	1.006D
PB-212	153.79	77.11	332.	0.	0.000	102.25	0.511D
CE-144	159.81	80.12	289.	8.	0.004	928.43	1.009D
EU-155	172.48	86.45	251.	0.	0.000	0.00	1.013D
NP-237	172.56	86.49	237.	14.	0.007	474.24	1.013D
CD-109	175.66	88.04	368.	0.	0.000	0.00	1.014D
TH-234	184.34	92.38	350.	24.	0.012	335.03	1.018D
TH-234	185.18	92.80	305.	72.	0.036	108.66	1.018D
NP-237	191.32	95.87	257.	6.	0.003	1204.36	1.020D
Cm-243	198.69	99.55	240.	15.	0.008	443.19	1.023D
Cm-243	207.11	103.76	250.	2.	0.001	4027.80	1.026D
EU-155	210.21	105.31	227.	25.	0.012	262.91	1.027D
TE-132	222.00	111.20	251.	6.	0.003	1140.54	0.097s
TE-132	232.20	116.30	207.	15.	0.008	410.65	1.035D
Cm-243	233.60	117.00	169.	20.	0.010	279.67	1.035D
EU-152	243.16	121.78	185.	8.	0.004	741.44	1.039D
CO-57	243.74	122.07	179.	14.	0.007	372.63	1.039D
EU-154	245.80	123.10	220.	6.	0.003	1044.81	1.039D
CE-144	266.67	133.53	141.	4.	0.002	1128.00	1.047D
CO-57	272.48	136.43	192.	21.	0.011	281.04	1.049D
U-235	287.14	143.76	115.	29.	0.015	164.89	1.054D
CE-141	290.52	145.45	199.	9.	0.004	682.96	1.055D
TE-131	299.07	149.72	185.	3.	0.001	2052.21	1.059D
U-235	326.34	163.35	67.	0.	0.000	0.00	0.333D
CE-139	331.25	165.80	209.	61.	0.030	185.29	0.686s
SB-125	350.49	175.42	128.	41.	0.021	190.95	0.695s
U-235	371.10	185.72	234.	135.	0.068	8.21	1.084A
RA-226	371.64	185.99	156.	0.	0.000	5299.06	1.107A
U-235	410.29	205.31	45.	0.	0.000	0.00	0.250D
TE-132	454.98	227.64	77.	31.	0.015	188.03	0.865s
TH-227	471.70	236.00	130.	21.	0.010	242.22	1.120D
PB-212	476.96	238.63	84.	598.	0.299	13.89	1.122D
RA-224	481.70	241.00	125.	53.	0.027	98.21	1.938A
PB-214	483.54	241.92	136.	69.	0.034	11.30	1.124A
SN-113	509.64	254.96	60.	0.	0.000	0.00	1.133
TH-227	512.00	256.14	34.	4.	0.002	500.00	0.000s
Cm-243	554.93	277.60	95.	10.	0.005	418.98	1.149D
HG-203	558.07	279.17	82.	3.	0.001	493.04	1.150D
J-131	568.67	284.47	46.	34.	0.017	138.23	1.538s
PB-214	590.11	295.18	139.	161.	0.081	45.57	1.009
CR-51	639.83	320.03	42.	12.	0.006	335.41	0.690s
AC-228	676.39	338.30	68.	110.	0.055	45.37	1.160
EU-152	687.00	343.61	17.	0.	0.000	0.00	0.194s
PB-214	703.48	351.84	63.	231.	0.115	26.00	1.064
J-131	730.00	365.10	9.	0.	0.000	0.00	0.250s
SN-113	782.83	391.50	17.	1.	0.000	764.85	0.562s
SB-125	852.89	426.51	38.	20.	0.010	163.72	0.589s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Ag-108M	865.14	432.64	26.	7.	0.004	329.19	1.319
TE-131	905.78	452.95	27.	5.	0.003	461.99	1.055
SB-125	926.92	463.51	50.	0.	0.000	0.00	1.017D
TE-131	984.00	492.04	8.	0.	0.000	0.00	0.111s
TL-208	1021.38	510.72	36.	49.	0.025	66.89	1.310D
Kr-85	1027.92	513.99	27.	0.	0.000	4628.18	1.313D
CS-134	1138.58	569.29	15.	0.	0.000	0.00	0.583D
BI-207	1139.00	569.50	9.	0.	0.000	0.00	0.250s
TL-208	1166.13	583.06	35.	148.	0.074	31.49	1.479
SB-125	1201.57	600.77	8.	0.	0.000	0.00	0.000D
CS-134	1209.35	604.66	33.	2.	0.001	1604.04	1.374D
BI-214	1218.68	609.32	32.	159.	0.080	28.11	1.378D
Ag-108M	1228.78	614.37	19.	0.	0.000	0.00	0.456D
SB-125	1272.36	636.15	9.	0.	0.000	0.00	0.000D
J-131	1274.00	636.97	4.	0.	0.000	0.00	0.000s
AG-110M	1315.58	657.75	32.	6.	0.003	408.91	1.410D
CS-137	1323.33	661.62	28.	31.	0.015	91.46	1.413D
NB-94	1399.58	699.73	18.	13.	0.007	175.75	0.444s
Ag-108M	1446.05	722.95	15.	0.	0.000	0.00	1.454D
EU-154	1446.75	723.30	13.	2.	0.001	725.95	1.454D
BI-212	1454.49	727.17	29.	39.	0.020	75.09	1.457D
EU-152	1557.00	778.40	5.	0.	0.000	0.00	0.083s
BI-212	1573.10	786.44	20.	23.	0.012	125.79	1.045s
CS-134	1592.00	795.89	18.	12.	0.006	200.10	0.200s
CS-134	1603.91	801.84	18.	0.	0.000	0.00	1.506
CO-58	1622.00	810.88	4.	0.	0.000	0.00	0.000s
MN-54	1670.44	835.09	11.	15.	0.007	135.89	1.749
MN-56	1695.48	847.60	16.	16.	0.008	150.00	0.763s
NB-94	1744.17	871.93	5.	2.	0.001	519.62	0.602s
AG-110M	1769.02	884.35	15.	17.	0.008	143.53	0.818s
Y-88	1795.62	897.64	4.	12.	0.006	104.49	1.990s
AC-228	1822.24	910.94	14.	106.	0.053	34.97	1.501
AG-110M	1873.67	936.64	7.	3.	0.001	434.09	0.401s
EU-152	1928.41	964.00	27.	22.	0.011	122.01	1.612D
AC-228	1938.21	968.90	11.	62.	0.031	44.66	1.616D
EU-154	2009.00	1004.27	9.	10.	0.005	171.03	0.170s
BI-207	2129.61	1064.54	9.	29.	0.015	77.06	3.556s
FE-59	2198.00	1098.72	3.	0.	0.000	0.00	0.250s
EU-152	2224.72	1112.07	23.	8.	0.004	295.04	1.707D
ZN-65	2231.62	1115.52	22.	0.	0.000	0.00	1.710D
BI-214	2241.15	1120.28	22.	38.	0.019	71.24	1.713D
TA-182	2243.15	1121.28	57.	0.	0.000	0.00	1.713D
TE-131	2293.14	1146.26	16.	11.	0.005	209.49	0.583s
CO-60	2345.62	1172.49	31.	2.	0.001	301.09	0.866s
TA-182	2375.01	1187.17	20.	9.	0.004	276.89	0.445s
TA-182	2441.87	1220.58	22.	9.	0.005	283.78	0.994s
EU-154	2538.47	1268.85	10.	18.	0.009	129.52	0.988s
FE-59	2579.89	1289.55	13.	3.	0.002	595.62	0.472s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CO-60	2664.47	1331.81	11.	3.	0.002	143.85	1.309
AG-110M	2768.00	1383.54	0.	0.	0.000	0.00	0.000s
EU-152	2817.58	1408.31	4.	6.	0.003	197.30	0.712s
K-40	2921.59	1460.29	10.	474.	0.237	14.35	1.821
BI-212	3241.00	1619.88	0.	7.	0.004	113.39	0.500s
BI-214	3529.80	1764.18	0.	15.	0.007	77.46	1.103s
MN-56	3625.00	1811.75	0.	1.	0.001	300.00	0.500s
Y-88	3674.00	1836.23	0.	2.	0.001	212.13	0.500s

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 microCi	Peak Energy keV	Peak Activity microCi	Code	MDA Value microCi	Comments
K-40		2.0323E-02	1460.75	2.032E-02	(	7.328E-04	G
CR-51		0.0000E+00	320.07	0.000E+00	%	3.779E-04	G
MN-54		4.2193E-05	834.81	4.219E-05	(	5.110E-05	G
MN-56		4.6022E-05	846.60	4.602E-05	&(	6.141E-05	G
			1811.20	0.000E+00	%	1.512E-04	G
FE-59		0.0000E+00	1099.22	0.000E+00	?	6.835E-05	G
			1291.56	0.000E+00	&	1.851E-04	G
CO-57		1.3068E-04	122.07	0.000E+00	} P	4.854E-05	G
			136.43	1.307E-04	(	4.090E-04	G
CO-58		0.0000E+00	810.75	0.000E+00	?	3.314E-05	G
CO-60		0.0000E+00	1332.51	0.000E+00	% P	7.688E-05	G
			1173.23	0.000E+00	% P	1.084E-04	G
Cm-243		0.0000E+00	277.60	0.000E+00	%	3.405E-04	G
			117.00	1.201E-04	}	3.745E-04	G
			103.76	0.000E+00	%	2.170E-04	G
			99.55	0.000E+00	%	3.461E-04	G
ZN-65		0.0000E+00	1115.52	0.000E+00	%	1.756E-04	G
Kr-85		0.0000E+00	513.99	0.000E+00	%	1.113E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Y-88	2.4056E-05	1836.01	9.971E-06	?(P	4.191E-05		G
		898.02	3.894E-05	(P	3.765E-05		G
NB-94	0.0000E+00	871.10	0.000E+00	&	3.835E-05		G
		702.50	3.127E-05	&	5.408E-05		G
Ag-108M	0.0000E+00	722.95	0.000E+00	}	5.665E-05		G
		614.37	0.000E+00	?	5.367E-05		G
		433.93	0.000E+00	&	4.473E-05		G
AG-110M	0.0000E+00	657.75	0.000E+00	%	6.933E-05		G
		884.67	6.841E-05	?	8.477E-05		G
		937.48	0.000E+00	&	1.392E-04		G
		1384.27	0.000E+00	?	1.326E-04		G
CD-109	0.0000E+00	88.04	0.000E+00	!	1.699E-03		G
SN-113	0.0000E+00	391.71	0.000E+00	% P	4.716E-05		G
		255.04	0.000E+00		1.719E-03		G
SB-125	1.6200E-04	427.95	9.869E-05	&(	1.581E-04		G
		600.77	0.000E+00	%	1.749E-04		G
		636.15	0.000E+00	}	3.219E-04		G
		463.51	0.000E+00	&	5.768E-04		G
		176.29	4.595E-04	&(	6.212E-04		G
TE-131	0.0000E+00	149.72	0.000E+00	%	6.331E-05		G
		452.32	0.000E+00	%	2.331E-04		G
		1146.96	8.242E-04	?	1.600E-03		G
		492.66	0.000E+00	?	5.648E-04		G
TE-132	2.9323E-05	228.16	2.932E-05	(	4.124E-05		G
		116.30	0.000E+00	}	2.289E-03		G
		111.76	0.000E+00	&	2.658E-03		G
J-131	0.0000E+00	364.48	0.000E+00	&	2.629E-05		G
		636.97	0.000E+00	}	3.636E-04		G
		284.29	5.586E-04		5.694E-04		G
CS-134	0.0000E+00	604.66	0.000E+00	%	6.358E-05		G
		795.76	3.680E-05	?	7.149E-05		G
		569.29	0.000E+00	}	2.658E-04		G
		801.84	0.000E+00	%	6.957E-04		G
CS-137	8.2449E-05	661.62	8.245E-05	(	7.402E-05		G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-139	5.2148E-05	165.85	5.215E-05	*(P	6.007E-05		G
CE-141	0.0000E+00	145.45	0.000E+00	%	9.332E-05		G
CE-144	0.0000E+00	133.53	0.000E+00	%	3.450E-04		G
		80.12	0.000E+00	%	3.859E-03		G
EU-152	0.0000E+00	121.78	0.000E+00	}	1.445E-04		G
		344.30	0.000E+00	&	9.831E-05		G
		1408.08	1.153E-04	?	2.396E-04		G
		964.00	4.711E-04	$	5.947E-04		G
		1112.07	2.000E-04	$	6.740E-04		G
		778.90	0.000E+00	?	2.671E-04		G
EU-154	0.0000E+00	123.10	0.000E+00	%	1.134E-04		G
		1274.80	2.009E-04	&	1.960E-04		G
		723.30	0.000E+00	}	2.432E-04		G
		1004.80	1.882E-04	?	3.141E-04		G
EU-155	7.4427E-05	86.45	0.000E+00	}	1.654E-04		G
		105.31	7.443E-05	$(	2.173E-04		G
TA-182	0.0000E+00	67.75	0.000E+00	%	1.781E-04		G
		1121.28	0.000E+00	%	3.946E-04		G
		1221.42	1.337E-04	?	3.496E-04		G
		1189.05	2.098E-04	&	5.491E-04		G
HG-203	0.0000E+00	279.17	0.000E+00	% P	5.486E-05		G
		72.87	3.322E-04		1.059E-03		G
TL-208	3.5662E-04	583.14	3.479E-04	(	7.118E-05		G
		510.72	3.899E-04	(	2.418E-04		G
PB-212	1.2045E-03	238.63	1.205E-03	(	9.163E-05		G
		77.11	0.000E+00	}	3.933E-04		Energy duplication
		74.81	1.757E-03	}	6.867E-04		G
PB-214	8.0652E-04	351.99	7.691E-04	(	1.327E-04		G
		295.22	8.789E-04	(	3.137E-04		G
		77.11	2.336E-03	}	5.993E-04		Energy duplication
		241.92	8.065E-04	}	6.697E-04		G
BI-207	1.3260E-04	569.67	0.000E+00	}	3.367E-05		G
		1063.62	1.326E-04	&(	7.426E-05		G
		74.97	0.000E+00	}	1.979E-04		G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-212	9.1285E-04	727.17	8.267E-04	(	5.824E-04		G
		1620.56	1.283E-03	?(	1.350E-03		G
		785.42	3.062E-03	&	3.135E-03		G
BI-214	7.7649E-04	609.32	7.283E-04	(	1.324E-04		G
		1764.51	5.131E-04	-	2.521E-04		G
		1120.28	9.242E-04	(	5.948E-04		G
RA-224	1.1930E-03	241.00	1.193E-03	}(	1.879E-03		G
RA-226	0.0000E+00	185.99	0.000E+00	}	1.351E-03		G
AC-228	1.1144E-03	911.07	1.111E-03	(	2.111E-04		G
		968.90	1.133E-03	(	3.379E-04		G
		338.40	1.095E-03	(	4.064E-04		G
TH-227	1.5947E-04	236.00	1.595E-04	(	4.291E-04		G
		256.25	0.000E+00	%	4.075E-04		G
TH-234	2.1946E-03	63.29	2.195E-03	(	2.180E-03		G
		92.80	1.632E-03	}	1.904E-03		G
		92.38	0.000E+00	}	2.381E-03		G
U-235	1.8200E-04	185.72	1.820E-04	}	9.956E-05		G
		143.76	1.820E-04	$(	3.273E-04		G
		205.31	0.000E+00	?	5.598E-04		G
		163.35	0.000E+00	&	5.919E-04		G
NP-237	0.0000E+00	86.49	0.000E+00	}	4.021E-04		G
		95.87	0.000E+00	%	1.752E-03		G
AM-241	1.6222E-04	59.54	1.622E-04	(P	3.182E-04		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
K-40		1.0369E+01	1.0369E+01	1.4881E+00	1.5993E+00
CR-51	<	1.9279E-01	2.3721E-01		
MN-54	A	2.1527E-02	2.1926E-02	2.9796E-02	2.9822E-02
MN-56	#A	2.3481E-02	>12 Halflives	3.5221E-02	3.5246E-02
FE-59	<	3.4873E-02	3.9609E-02		
CO-57	A	6.6674E-02	6.8108E-02	1.9141E-01	1.9144E-01
CO-58	<	1.6908E-02	1.8337E-02		
CO-60	<	3.9226E-02	3.9343E-02		
Cm-243	<	1.7371E-01	1.7380E-01		
ZN-65	<	8.9609E-02	9.1745E-02		
Kr-85	<	5.6772E+02	5.6776E+02		
Y-88	A	1.2274E-02	1.2953E-02	1.4421E-02	1.4440E-02
NB-94	<	1.9567E-02	1.9567E-02		
Ag-108M	<	2.7383E-02	2.7386E-02		
AG-110M	<	3.5372E-02	3.6194E-02		
CD-109	<	8.6708E-01	8.7814E-01		
SN-113	<	2.4062E-02	2.5293E-02		
SB-125	#	8.2653E-02	8.3124E-02	1.0454E-01	1.0464E-01
TE-131	<	3.23E-02	>12 Halflives		
TE-132	#A	1.4961E-02	8.7766E-02	1.6502E-01	1.6510E-01
J-131	<	1.3414E-02	2.7401E-02		
CS-134	<	3.2441E-02	3.2689E-02		
CS-137		4.2066E-02	4.2088E-02	3.8495E-02	3.8569E-02
CE-139	#A	2.6606E-02	2.7741E-02	5.1520E-02	5.1544E-02
CE-141	<	4.7614E-02	5.6854E-02		
CE-144	<	1.7603E-01	1.7963E-01		
EU-152	<	5.0158E-02	5.0220E-02		
EU-154	<	5.7870E-02	5.7977E-02		
EU-155	A	3.7973E-02	3.8094E-02	1.0015E-01	1.0018E-01
TA-182	<	9.0865E-02	9.5518E-02		

HG-203	<	2.7990E-02	3.1662E-02

TL-208		1.8195E-01	>12 Halflives	5.7295E-02	5.8210E-02
PB-212		6.1455E-01	>12 Halflives	8.5342E-02	9.2136E-02
PB-214		4.1149E-01	>12 Halflives	1.0698E-01	1.0947E-01
BI-207	#C	6.7653E-02	6.7681E-02	5.2157E-02	5.2297E-02
BI-212		4.6574E-01	>12 Halflives	3.1670E-01	3.1779E-01
BI-214		3.9617E-01	>12 Halflives	1.1135E-01	1.1358E-01
RA-224	#	6.0865E-01	2.9230E+00	3.6865E+03	2.8754E+00
AC-228		5.6859E-01	>12 Halflives	1.3766E-01	1.4136E-01
TH-227	A	8.1361E-02	1.1098E-01	2.6881E-01	2.6888E-01
TH-234		1.1197E+00	1.4210E+00	1.3352E+00	1.3376E+00
U-235	A	9.2856E-02	9.2856E-02	1.5311E-01	1.5320E-01
NP-237	<	8.9386E-01	8.9386E-01		
AM-241	A	8.2768E-02	8.2771E-02	1.4799E-01	1.4806E-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 2023.1 keV) 1.2726746E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 1.5449098E+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_14DEC2004_1635.An1

Sample description
Detector 101 FSS-OOL-04-01-002-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\101F_14DEC2004_1635.An1

Acquisition information

Start time:	14-Dec-2004 16:30:33
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:	YAEC_OperatingSpectrumRevA.Lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters

Analysis engine:	wan32 G53W2.06
Start channel:	100 (50.23keV)
Stop channel:	4048 (2023.09keV)
Peak rejection level:	100.000%
Peak search sensitivity:	3
Sample Size:	1.8720E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.8720E+03) = 5.3419E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	best method (based on spectrum).

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

Corrections	Status	Comments
Decay correct to date:	YES	03-Dec-2004 11:40:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

Energy Calibration
Normalized diff: 0.1419

********** 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	
106.80	53.63	396.	178.	0.089	88.41	1.859	LU-177	s
173.99	87.21	251.	135.	0.067	56.22	1.014	PB-214	D
179.20	89.82	279.	87.	0.043	87.93	1.016	PB-214	D
257.92	129.48	213.	61.	0.031	108.29	1.044	AC-228	D
397.19	198.76	81.	47.	0.023	122.94	0.940	SE-75	
419.04	209.68	120.	110.	0.055	72.67	1.037	NP-239	s
1536.85	768.33	13.	24.	0.012	89.49	1.144	BI-214	s

s - Peak fails shape tests.
D - Peak area deconvoluted.

This section based on library: YAEC_OperatingSpectrumRevA.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
AM-241	118.64	59.54	181.	14.	0.007	400.58	0.994D
TH-234	126.14	63.29	246.	70.	0.035	102.33	0.996D
TA-182	134.00	67.22	122.	2.	0.001	1637.68	0.000s
HG-203	145.31	72.87	209.	5.	0.003	1206.22	1.003D
PB-212	149.19	74.81	331.	173.	0.086	50.19	1.005D
BI-207	149.51	74.97	440.	0.	0.000	0.00	0.000D
PB-214	153.79	77.11	332.	288.	0.144	32.11	1.006D
PB-212	153.79	77.11	442.	0.	0.000	678.44	0.000D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CE-144	159.81	80.12	335.	0.	0.000	0.00	1.009D
EU-155	172.48	86.45	301.	0.	0.000	0.00	1.013D
NP-237	172.56	86.49	289.	12.	0.006	624.98	1.013D
CD-109	175.66	88.04	436.	0.	0.000	0.00	1.014D
TH-234	184.34	92.38	386.	11.	0.005	784.86	1.017D
TH-234	185.18	92.80	290.	122.	0.061	64.87	1.018D
NP-237	191.32	95.87	262.	36.	0.018	199.52	1.020D
Cm-243	198.69	99.55	240.	47.	0.024	145.37	1.023D
Cm-243	207.11	103.76	226.	49.	0.024	137.18	1.026D
EU-155	210.21	105.31	234.	52.	0.026	130.41	1.027D
TE-132	224.25	112.33	135.	8.	0.004	822.01	1.166
TE-132	232.20	116.30	159.	0.	0.000	0.00	0.987D
Cm-243	233.56	116.98	100.	18.	0.009	297.21	0.300s
EU-152	243.16	121.78	209.	19.	0.010	321.61	1.038D
CO-57	243.74	122.07	229.	0.	0.000	0.00	1.039D
EU-154	245.80	123.10	182.	10.	0.005	589.87	1.039D
CE-144	266.67	133.53	198.	39.	0.019	162.18	1.047D
CO-57	272.48	136.43	110.	0.	0.000	0.00	1.075D
U-235	287.14	143.76	239.	15.	0.008	432.94	1.054D
CE-141	290.52	145.45	206.	13.	0.007	472.69	1.055D
TE-131	299.07	149.72	242.	32.	0.016	210.59	1.058D
U-235	326.34	163.35	96.	3.	0.001	1413.55	1.068D
CE-139	331.34	165.85	167.	11.	0.005	515.19	1.070D
SB-125	347.00	173.68	158.	16.	0.008	365.57	0.257s
U-235	371.10	185.72	290.	0.	0.000	0.00	1.084A
RA-226	371.64	185.99	240.	92.	0.046	78.13	0.744A
U-235	410.29	205.31	80.	0.	0.000	0.00	0.707D
TE-132	455.50	227.91	40.	0.	0.000	0.00	0.583s
TH-227	471.70	236.00	129.	40.	0.020	128.37	1.120D
PB-212	476.96	238.63	84.	566.	0.283	14.38	1.122D
RA-224	481.70	241.00	96.	39.	0.020	116.59	1.296A
PB-214	483.54	241.92	118.	72.	0.036	10.69	1.124A
SN-113	509.79	255.04	45.	0.	0.000	0.00	0.000D
TH-227	512.00	256.14	32.	0.	0.000	0.00	0.000s
Cm-243	554.93	277.60	77.	36.	0.018	113.28	1.149D
HG-203	558.07	279.17	85.	1.	0.000	663.37	1.150D
J-131	569.67	284.96	35.	15.	0.007	234.52	0.750
PB-214	590.11	295.18	106.	170.	0.085	38.98	1.053
CR-51	641.17	320.70	27.	5.	0.002	455.58	0.631s
AC-228	676.50	338.36	76.	98.	0.049	51.84	1.152
EU-152	687.27	343.74	24.	3.	0.002	655.74	0.478s
PB-214	703.54	351.87	110.	244.	0.122	30.01	1.100s
J-131	729.25	364.72	24.	26.	0.013	132.39	1.806s
SN-113	778.71	389.44	37.	7.	0.003	355.56	0.519s
SB-125	855.93	428.03	53.	13.	0.006	298.88	0.908s
Ag-108M	870.00	435.06	16.	3.	0.002	544.67	0.000s
TE-131	904.69	452.40	27.	8.	0.004	299.12	0.787s
SB-125	926.53	463.32	50.	32.	0.016	126.48	0.702s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TE-131	985.75	492.92	31.	30.	0.015	109.30	0.578s
TL-208	1021.38	510.72	49.	75.	0.037	52.82	1.310D
Kr-85	1027.92	513.99	48.	12.	0.006	264.47	1.313D
CS-134	1138.58	569.29	39.	4.	0.002	687.55	1.350D
BI-207	1139.34	569.67	46.	3.	0.001	1073.99	1.351D
TL-208	1166.16	583.07	32.	147.	0.074	31.00	1.503
SB-125	1201.57	600.77	17.	5.	0.002	409.83	1.372D
CS-134	1209.35	604.66	25.	10.	0.005	244.74	1.374D
BI-214	1218.68	609.32	16.	188.	0.094	23.59	1.378D
Ag-108M	1228.78	614.37	13.	8.	0.004	209.13	1.381D
SB-125	1271.02	635.48	18.	18.	0.009	141.68	0.877s
J-131	1274.25	637.09	23.	0.	0.000	0.00	1.396
AG-110M	1315.39	657.65	9.	0.	0.000	0.00	1.410
CS-137	1323.01	661.46	23.	97.	0.048	39.12	1.478
NB-94	1402.91	701.39	22.	12.	0.006	214.72	0.907s
Ag-108M	1446.05	722.95	27.	0.	0.000	0.00	1.454D
EU-154	1446.75	723.30	16.	11.	0.005	186.47	1.454D
BI-212	1454.49	727.17	24.	43.	0.021	66.64	1.457D
EU-152	1560.44	780.12	17.	12.	0.006	183.29	0.667s
BI-212	1571.50	785.64	15.	11.	0.005	189.93	0.502s
CS-134	1589.93	794.85	13.	28.	0.014	85.56	2.136s
CS-134	1603.91	801.84	15.	0.	0.000	0.00	1.506
CO-58	1623.20	811.48	22.	16.	0.008	177.45	0.502s
MN-54	1668.50	834.12	21.	5.	0.002	426.38	0.450s
MN-56	1691.14	845.43	5.	1.	0.001	956.56	0.407s
NB-94	1743.00	871.35	5.	2.	0.001	462.33	0.000s
AG-110M	1770.00	884.84	3.	0.	0.000	0.00	0.000s
Y-88	1792.59	896.13	13.	9.	0.005	184.93	0.415s
AC-228	1822.35	911.00	13.	133.	0.067	29.77	1.523s
AG-110M	1876.53	938.08	8.	9.	0.004	175.33	0.939s
EU-152	1928.41	964.00	13.	15.	0.008	126.08	1.612D
AC-228	1938.21	968.90	18.	49.	0.025	55.94	1.616D
EU-154	2012.48	1006.01	8.	5.	0.002	294.60	1.893
BI-207	2126.29	1062.88	11.	11.	0.005	177.10	0.533s
FE-59	2196.49	1097.96	10.	4.	0.002	439.16	0.410s
EU-152	2224.72	1112.07	14.	3.	0.001	574.54	1.708D
ZN-65	2231.62	1115.52	24.	0.	0.000	0.00	1.710D
BI-214	2241.15	1120.28	21.	33.	0.016	79.13	1.713D
TA-182	2243.15	1121.28	41.	0.	0.000	0.00	0.313D
TE-131	2294.00	1146.69	6.	0.	0.000	0.00	0.000s
CO-60	2347.46	1173.40	22.	8.	0.004	147.57	0.708s
TA-182	2371.50	1185.42	17.	19.	0.009	144.86	0.437s
TA-182	2445.00	1222.14	7.	1.	0.000	1077.03	0.000s
EU-154	2547.53	1273.38	4.	17.	0.009	95.03	0.583s
FE-59	2586.00	1292.60	5.	1.	0.001	956.56	0.000s
CO-60	2665.36	1332.25	9.	6.	0.003	107.09	0.551s
AG-110M	2767.00	1383.04	4.	1.	0.001	900.00	0.000s
EU-152	2817.76	1408.41	2.	11.	0.005	112.45	0.961s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
K-40	2921.80	1460.39	0.	422.	0.211	14.60	2.135
BI-212	3241.00	1619.88	5.	2.	0.001	587.37	0.000s
BI-214	3529.54	1764.05	0.	35.	0.018	50.71	1.799
MN-56	3624.00	1811.25	0.	1.	0.001	300.00	0.500s
Y-88	3672.00	1835.23	0.	0.	0.000	0.00	0.000s

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 microCi	Peak Energy keV	Peak Activity microCi	Peak Code	Peak MDA Value microCi	Comments
K-40		1.8113E-02	1460.75	1.811E-02	(	3.163E-04	G
CR-51		0.0000E+00	320.07	0.000E+00	&	3.108E-04	G
MN-54		0.0000E+00	834.81	0.000E+00	%	6.769E-05	G
MN-56		0.0000E+00	846.60	0.000E+00	&	3.777E-05	G
			1811.20	0.000E+00	%	1.512E-04	G
FE-59		0.0000E+00	1099.22	0.000E+00	&	1.129E-04	G
			1291.56	0.000E+00	&	1.253E-04	G
CO-57		0.0000E+00	122.07	0.000E+00	} P	5.470E-05	G
			136.43	0.000E+00	%	3.140E-04	G
CO-58		4.5453E-05	810.75	4.545E-05	(	6.836E-05	G
CO-60		2.9119E-05	1332.51	2.624E-05	?(P	7.007E-05	G
			1173.23	3.200E-05	(P	9.245E-05	G
Cm-243		2.3823E-04	277.60	2.581E-04	(	3.078E-04	G
			117.00	1.066E-04	}	2.920E-04	G
			103.76	1.390E-04	-	2.066E-04	G
			99.55	2.188E-04	$(	3.459E-04	G
ZN-65		0.0000E+00	1115.52	0.000E+00	%	1.818E-04	G
Kr-85		4.9156E-01	513.99	4.916E-01	(	1.461E+00	G
Y-88		0.0000E+00	1836.01	0.000E+00	? P	4.191E-05	G
			898.02	2.937E-05	& P	6.187E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	0.0000E+00	871.10	0.000E+00	%		3.835E-05	G
		702.50	2.766E-05	&		5.969E-05	G
Ag-108M	1.9558E-05	722.95	0.000E+00	}		7.347E-05	G
		614.37	1.956E-05	(		4.535E-05	G
		433.93	0.000E+00	&		3.607E-05	G
AG-110M	0.0000E+00	657.75	0.000E+00			4.069E-05	G
		884.67	0.000E+00	?		4.382E-05	G
		937.48	8.175E-05	?		1.443E-04	G
		1384.27	0.000E+00	&		2.164E-04	G
CD-109	0.0000E+00	88.04	0.000E+00	%		1.845E-03	G
SN-113	0.0000E+00	391.71	0.000E+00	&	P	6.676E-05	G
		255.04	0.000E+00	%		1.511E-03	G
SB-125	1.7946E-04	427.95	6.495E-05	(		1.857E-04	G
		600.77	0.000E+00	%		2.503E-04	G
		636.15	3.461E-04	}		4.440E-04	G
		463.51	5.184E-04	(		5.777E-04	G
		176.29	0.000E+00	&		6.857E-04	G
TE-131	9.3029E-05	149.72	3.097E-05	(		7.195E-05	G
		452.32	7.090E-05	?(		2.331E-04	G
		1146.96	0.000E+00	?		1.058E-03	G
		492.66	1.060E-03	*(		1.021E-03	G
TE-132	0.0000E+00	228.16	0.000E+00	?		3.044E-05	G
		116.30	0.000E+00	}		2.017E-03	G
		111.76	0.000E+00	&		1.975E-03	G
J-131	5.6205E-05	364.48	4.174E-05	(		4.060E-05	G
		636.97	0.000E+00	}		7.574E-04	G
		284.29	2.501E-04	&(		5.049E-04	G
CS-134	5.2363E-05	604.66	2.043E-05	(		5.622E-05	G
		795.76	8.886E-05	&(		6.121E-05	G
		569.29	0.000E+00	}		4.076E-04	G
		801.84	0.000E+00	%		6.371E-04	G
CS-137	2.6000E-04	661.62	2.600E-04	(		6.783E-05	G
CE-139	0.0000E+00	165.85	0.000E+00	%	P	5.397E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-141	0.0000E+00	145.45	0.000E+00	%		9.484E-05	G
CE-144	2.2981E-04	133.53	2.298E-04	(		4.070E-04	G
		80.12	0.000E+00	!		4.142E-03	G
EU-152	0.0000E+00	121.78	0.000E+00	}		1.530E-04	G
		344.30	0.000E+00	%		1.145E-04	G
		1408.08	2.306E-04	?		1.950E-04	G
		964.00	3.330E-04			4.246E-04	G
		1112.07	0.000E+00	%		5.306E-04	G
		778.90	2.509E-04	&		4.421E-04	G
EU-154	0.0000E+00	123.10	0.000E+00	%		1.036E-04	G
		1274.80	1.951E-04	&		1.381E-04	G
		723.30	1.329E-04	}		2.707E-04	G
		1004.80	9.096E-05	&		3.016E-04	G
EU-155	1.5627E-04	86.45	0.000E+00	}		1.806E-04	G
		105.31	1.563E-04	$(		2.203E-04	G
TA-182	0.0000E+00	67.75	0.000E+00	&		1.293E-04	G
		1121.28	0.000E+00	&		3.402E-04	G
		1221.42	0.000E+00	%		2.196E-04	G
		1189.05	4.430E-04	&		5.112E-04	G
HG-203	0.0000E+00	279.17	0.000E+00	%	P	5.577E-05	G
		72.87	0.000E+00	%		9.306E-04	G
TL-208	3.4634E-04	583.14	3.463E-04	(		6.801E-05	G
		510.72	5.915E-04	+		2.802E-04	G
PB-212	1.1385E-03	238.63	1.139E-03	(		9.167E-05	G
		77.11	0.000E+00	}		4.522E-04	Energy duplication
		74.81	1.469E-03	}		7.442E-04	G
PB-214	8.5082E-04	351.99	8.119E-04	@(		1.724E-04	G
		295.22	9.261E-04	(		2.761E-04	G
		77.11	2.117E-03	}		6.435E-04	Energy duplication
		241.92	8.508E-04	}		6.261E-04	G
BI-207	4.9725E-05	569.67	0.000E+00	}		6.942E-05	G
		1063.62	4.972E-05	?(		8.212E-05	G
		74.97	0.000E+00	}		2.120E-04	G
BI-212	9.8499E-04	727.17	9.037E-04	(		5.378E-04	G
		1620.56	0.000E+00	%		2.406E-03	G
		785.42	1.464E-03	?(		2.763E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-214	8.4604E-04	609.32	8.616E-04	(	9.640E-05		G
		1764.51	1.197E-03	+	2.521E-04		G
		1120.28	7.983E-04	(	5.866E-04		G
RA-224	8.7735E-04	241.00	8.773E-04	}(	2.000E-03		G
RA-226	2.0358E-03	185.99	2.036E-03	}(	1.550E-03		G
AC-228	1.3938E-03	911.07	1.394E-03	*(	2.045E-04		G
		968.90	9.067E-04	-	4.096E-04		G
		338.40	9.765E-04	-	4.309E-04		G
TH-227	3.0957E-04	236.00	3.096E-04	(	4.267E-04		G
		256.25	0.000E+00	?	3.938E-04		G
TH-234	2.1523E-03	63.29	2.152E-03	(	2.349E-03		G
		92.80	2.774E-03	}	1.857E-03		G
		92.38	0.000E+00	}	2.498E-03		G
U-235	0.0000E+00	185.72	0.000E+00	}	1.104E-04		G
		143.76	0.000E+00	%	4.640E-04		G
		205.31	0.000E+00	!	7.315E-04		G
		163.35	0.000E+00	%	7.019E-04		G
NP-237	8.0505E-04	86.49	0.000E+00	}	4.427E-04		G
		95.87	8.051E-04	(	1.769E-03		G
AM-241	0.0000E+00	59.54	0.000E+00	% P	2.847E-04		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
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

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
K-40		9.6757E+00	9.6757E+00	1.4130E+00	1.5151E+00
CR-51	<	1.6605E-01	2.1977E-01		
MN-54	<	3.6159E-02	3.7070E-02		
MN-56	<	2.02E-02	>12 Halflives		
FE-59	<	6.0317E-02	7.1648E-02		
CO-57	<	1.6772E-01	1.7262E-01		
CO-58	A	2.4280E-02	2.7096E-02	4.8080E-02	4.8105E-02
CO-60	A	1.5555E-02	1.5618E-02	2.7053E-02	2.7067E-02
Cm-243	A	1.2726E-01	1.2735E-01	1.1735E-01	1.1757E-01
ZN-65	<	9.7106E-02	1.0025E-01		
Kr-85	A	2.6259E+02	2.6261E+02	6.9451E+02	6.9467E+02
Y-88	<	2.2390E-02	2.4082E-02		
NB-94	<	2.0486E-02	2.0486E-02		
Ag-108M	A	1.0448E-02	1.0450E-02	2.1853E-02	2.1861E-02
AG-110M	<	2.1737E-02	2.2423E-02		
CD-109	<	9.8576E-01	1.0028E+00		
SN-113	<	3.5665E-02	3.8154E-02		
SB-125	A	9.5865E-02	9.6603E-02	1.2218E-01	1.2230E-01
TE-131	C	4.9695E-02	>12 Halflives	5.4316E-02	5.4386E-02
TE-132	<	1.6262E-02	1.7783E-01		
J-131		3.0024E-02	7.8865E-02	1.0441E-01	1.0450E-01
CS-134	A	2.7972E-02	2.8262E-02	2.4180E-02	2.4233E-02
CS-137		1.3889E-01	1.3899E-01	5.4371E-02	5.4935E-02
CE-139	<	2.8831E-02	3.0506E-02		
CE-141	<	5.0661E-02	6.4389E-02		
CE-144	A	1.2276E-01	1.2616E-01	2.0462E-01	2.0474E-01
EU-152	<	6.1177E-02	6.1279E-02		
EU-154	<	5.5348E-02	5.5486E-02		
EU-155	A	8.3478E-02	8.3836E-02	1.0933E-01	1.0943E-01
TA-182	<	6.9067E-02	7.3892E-02		
HG-203	<	2.9790E-02	3.5192E-02		
TL-208		1.8501E-01	>12 Halflives	5.7353E-02	5.8298E-02
PB-212		6.0819E-01	>12 Halflives	8.7433E-02	9.3944E-02
PB-214		4.5450E-01	>12 Halflives	1.1180E-01	1.1471E-01
BI-207	#A	2.6562E-02	2.6577E-02	4.7068E-02	4.7092E-02

BI-212		5.2617E-01	>12 Halflives	3.5066E-01	3.5192E-01
BI-214		4.5195E-01	>12 Halflives	1.0660E-01	1.0962E-01
RA-224	#	4.6867E-01	3.9102E+00	5.8764E+03	4.5643E+00
RA-226	#	1.0875E+00	1.0875E+00	1.1009E+03	8.5186E-01
AC-228		7.4456E-01	>12 Halflives	2.2164E-01	2.2560E-01
TH-227	A	1.6537E-01	2.5161E-01	3.2299E-01	3.2331E-01
TH-234	A	1.1498E+00	1.5868E+00	1.6237E+00	1.6261E+00
U-235	<	2.4787E-01	2.4787E-01		
NP-237	A	4.3005E-01	4.3005E-01	8.5803E-01	8.5836E-01
AM-241	<	1.5211E-01	1.5211E-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 2023.1 keV) 2.7626608E+02 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 2.8030930E+02 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_14DEC2004_1715.An1

Sample description
Detector 101 FSS-OOL-04-01-018-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\101F_14DEC2004_1715.An1

Acquisition information
Start time: 14-Dec-2004 17:06:43
Live time: 2000
Real time: 2003
Dead time: 0.14 %
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: YAEC_OperatingSpectrumRevA.Lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: wan32 G53W2.06
Start channel: 100 (50.23keV)
Stop channel: 4048 (2023.09keV)
Peak rejection level: 100.000%
Peak search sensitivity: 3
Sample Size: 2.0070E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0070E+03) =
4.9826E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	best method (based on spectrum).

YAEC Chemistry Lab Spectrum name: 101F_14DEC2004_1715.An1

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

Corrections	Status	Comments
Decay correct to date:	YES	06-Dec-2004 14:28:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

Energy Calibration
Normalized diff: 0.1271

********** 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	87.22	300.	152.	0.076	54.11	1.014	PB-214	D
179.20	89.77	356.	123.	0.061	70.58	1.016	PB-214	D
418.14	209.49	156.	61.	0.030	95.21	1.101	AC-228	D
540.65	270.46	50.	71.	0.036	66.27	1.048	AC-228	
599.08	299.62	110.	44.	0.022	110.04	1.164	TH-227	D
654.72	327.47	95.	67.	0.034	113.01	1.355	AC-228	s
925.55	462.81	66.	40.	0.020	99.72	1.278	CS-138	D

s - Peak fails shape tests.
D - Peak area deconvoluted.

This section based on library: YAEC_OperatingSpectrumRevA.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
AM-241	118.64	59.54	295.	26.	0.013	289.07	0.994D
TH-234	126.14	63.29	301.	72.	0.036	108.51	0.996D
TA-182	136.55	68.49	258.	78.	0.039	128.14	1.400s
HG-203	145.31	72.87	413.	31.	0.015	286.68	1.003D
PB-212	149.19	74.81	340.	263.	0.132	34.98	1.005D
BI-207	149.51	74.97	603.	0.	0.000	0.00	1.005D
PB-214	153.79	77.11	376.	379.	0.189	26.62	1.006D
PB-212	153.79	77.11	542.	0.	0.000	382.34	0.457D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CE-144	159.81	80.12	180.	0.	0.000	0.00	1.044D
EU-155	172.48	86.45	341.	0.	0.000	0.00	1.013D
NP-237	172.56	86.49	319.	22.	0.011	344.75	1.013D
CD-109	175.66	88.04	523.	0.	0.000	0.00	1.014D
TH-234	184.34	92.38	489.	0.	0.000	0.00	1.017D
TH-234	185.18	92.80	366.	126.	0.063	70.03	1.018D
NP-237	191.32	95.87	345.	1.	0.000	11435.07	1.020D
Cm-243	198.69	99.55	304.	55.	0.028	140.11	1.023D
Cm-243	207.11	103.76	338.	0.	0.000	0.00	1.026D
EU-155	210.21	105.31	298.	37.	0.018	205.13	1.027D
TE-132	223.64	112.02	308.	70.	0.035	171.96	2.029s
TE-132	232.20	116.30	242.	0.	0.000	0.00	2.613D
Cm-243	234.35	117.38	242.	58.	0.029	173.55	2.613s
EU-152	243.16	121.78	300.	10.	0.005	705.48	1.038D
CO-57	243.74	122.07	311.	0.	0.000	0.00	1.039D
EU-154	245.80	123.10	319.	15.	0.008	499.43	1.039D
CE-144	264.39	132.39	304.	61.	0.031	195.55	1.195s
CO-57	272.48	136.43	185.	0.	0.000	0.00	0.900D
U-235	287.14	143.76	194.	35.	0.018	176.21	1.054D
CE-141	290.52	145.45	253.	30.	0.015	230.77	1.055D
TE-131	299.07	149.72	275.	7.	0.004	991.13	1.058D
U-235	326.34	163.35	174.	36.	0.018	162.59	1.068D
CE-139	331.34	165.85	229.	22.	0.011	302.49	1.070D
SB-125	351.96	176.16	341.	27.	0.014	526.28	0.548s
U-235	371.10	185.72	291.	232.	0.116	5.97	1.084A
RA-226	371.64	185.99	196.	0.	0.000	5939.70	1.207A
U-235	410.29	205.31	130.	0.	0.000	28966.79	1.098D
TE-132	458.00	229.15	144.	67.	0.034	125.61	2.088s
TH-227	471.70	236.00	172.	47.	0.024	125.92	1.120D
PB-212	476.96	238.63	112.	739.	0.370	12.59	1.121D
RA-224	481.70	241.00	128.	50.	0.025	105.61	1.973A
PB-214	483.54	241.92	168.	90.	0.045	7.95	1.124A
SN-113	509.79	255.04	62.	0.	0.000	0.00	0.648D
TH-227	513.00	256.64	34.	0.	0.000	0.00	0.000s
Cm-243	554.93	277.60	80.	61.	0.030	73.51	1.149D
HG-203	558.07	279.17	118.	10.	0.005	316.58	1.150D
J-131	569.79	285.02	50.	14.	0.007	294.59	1.285
PB-214	590.19	295.22	83.	201.	0.101	28.51	1.161D
CR-51	639.00	319.62	28.	0.	0.000	0.00	0.333s
AC-228	676.34	338.28	130.	138.	0.069	48.99	1.255
EU-152	688.78	344.49	32.	4.	0.002	680.79	0.604s
PB-214	703.45	351.83	88.	309.	0.154	22.94	1.119s
J-131	729.00	364.60	35.	1.	0.001	2421.78	0.000s
SN-113	785.00	392.58	28.	2.	0.001	622.09	0.000s
SB-125	854.29	427.21	37.	7.	0.004	385.71	0.879
Ag-108M	870.26	435.20	40.	12.	0.006	241.14	0.863
TE-131	904.92	452.52	28.	12.	0.006	219.85	1.867s
SB-125	926.92	463.51	93.	5.	0.003	790.41	1.278D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TE-131	983.56	491.82	28.	13.	0.007	204.24	0.472s
TL-208	1021.38	510.72	59.	72.	0.036	57.61	1.310D
Kr-85	1027.92	513.99	50.	11.	0.006	278.08	1.313D
CS-134	1137.74	568.87	20.	9.	0.004	225.26	0.617s
BI-207	1139.60	569.80	29.	0.	0.000	0.00	1.351
TL-208	1166.11	583.05	56.	228.	0.114	26.55	1.073
SB-125	1201.57	600.77	13.	0.	0.000	0.00	1.199D
CS-134	1209.35	604.66	29.	14.	0.007	176.30	1.374D
BI-214	1218.68	609.32	34.	204.	0.102	24.26	1.378D
Ag-108M	1228.78	614.37	28.	1.	0.001	1832.91	1.381D
SB-125	1272.36	636.15	32.	0.	0.000	0.00	0.481D
J-131	1272.06	636.00	32.	11.	0.006	259.06	0.481s
AG-110M	1315.58	657.75	38.	10.	0.005	283.13	1.410D
CS-137	1323.33	661.62	34.	43.	0.021	74.10	1.413D
NB-94	1407.42	703.64	23.	21.	0.010	132.16	1.791s
Ag-108M	1446.05	722.95	27.	10.	0.005	248.14	1.454D
EU-154	1446.75	723.30	33.	0.	0.000	0.00	1.454D
BI-212	1454.49	727.17	31.	35.	0.018	83.30	1.457D
EU-152	1555.68	777.74	15.	11.	0.006	178.66	0.790s
BI-212	1572.01	785.90	14.	17.	0.009	121.41	0.962s
CS-134	1593.14	796.46	35.	0.	0.000	0.00	1.503
CS-134	1604.00	801.88	7.	0.	0.000	0.00	0.000s
CO-58	1623.00	811.38	13.	5.	0.002	384.52	0.666s
MN-54	1667.53	833.63	20.	12.	0.006	210.55	0.657s
MN-56	1693.00	846.36	10.	2.	0.001	648.07	0.000s
NB-94	1744.00	871.85	4.	0.	0.000	0.00	0.000s
AG-110M	1764.36	882.02	17.	13.	0.006	194.67	0.412s
Y-88	1794.05	896.86	10.	12.	0.006	139.00	0.509s
AC-228	1822.02	910.83	20.	108.	0.054	35.73	1.179
AG-110M	1877.57	938.59	13.	6.	0.003	283.55	0.678s
EU-152	1928.41	964.00	35.	17.	0.009	163.62	1.612D
AC-228	1938.21	968.90	24.	92.	0.046	38.62	1.616D
EU-154	2013.78	1006.66	9.	9.	0.004	187.08	1.113
BI-207	2130.11	1064.79	19.	23.	0.012	118.92	0.708s
FE-59	2198.00	1098.72	3.	0.	0.000	0.00	0.125s
EU-152	2224.72	1112.07	27.	8.	0.004	313.98	1.707D
ZN-65	2231.62	1115.52	31.	3.	0.002	719.99	1.709D
BI-214	2241.15	1120.28	35.	29.	0.015	101.04	1.713D
TA-182	2243.15	1121.28	35.	0.	0.000	0.00	0.231D
TE-131	2293.41	1146.39	15.	7.	0.004	263.71	0.891s
CO-60	2346.54	1172.95	29.	5.	0.003	203.67	0.570s
TA-182	2380.42	1189.87	16.	4.	0.002	482.18	0.583s
TA-182	2442.20	1220.74	12.	2.	0.001	626.21	0.417s
EU-154	2552.67	1275.94	10.	15.	0.007	129.10	0.949s
FE-59	2582.87	1291.03	9.	9.	0.004	200.36	0.533s
CO-60	2661.58	1330.37	18.	14.	0.007	116.23	1.110s
AG-110M	2771.00	1385.04	2.	0.	0.000	552.27	0.416s
EU-152	2817.46	1408.26	3.	11.	0.005	124.37	1.045s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
K-40	2921.66	1460.32	19.	598.	0.299	13.05	1.678
BI-212	3242.03	1620.40	2.	7.	0.004	147.17	0.934s
BI-214	3528.96	1763.76	0.	45.	0.023	44.72	2.463
MN-56	3622.00	1810.25	0.	0.	0.000	0.00	0.000s
Y-88	3672.00	1835.23	0.	0.	0.000	0.00	0.000s

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 microCi	Peak Energy keV	Peak Activity microCi	Peak Code	Peak MDA Value microCi	Comments
K-40		2.5667E-02	1460.75	2.567E-02	(	9.882E-04	G
CR-51		0.0000E+00	320.07	0.000E+00	?	3.142E-04	G
MN-54		3.3285E-05	834.81	3.329E-05	&(	6.649E-05	G
MN-56		0.0000E+00	846.60	0.000E+00	%	5.018E-05	G
			1811.20	0.000E+00	?	1.512E-04	G
FE-59		0.0000E+00	1099.22	0.000E+00	?	6.835E-05	G
			1291.56	8.428E-05	?	1.605E-04	G
CO-57		0.0000E+00	122.07	0.000E+00	} P	6.340E-05	G
			136.43	0.000E+00	%	4.023E-04	G
CO-58		0.0000E+00	810.75	0.000E+00	%	5.434E-05	G
CO-60		6.0134E-05	1332.51	6.013E-05	&(P	9.479E-05	G
			1173.23	0.000E+00	% P	1.048E-04	G
Cm-243		4.2970E-04	277.60	4.297E-04	(	3.148E-04	G
			117.00	3.464E-04	}	4.449E-04	G
			103.76	0.000E+00	!	2.509E-04	G
			99.55	2.546E-04	-	3.877E-04	G
ZN-65		0.0000E+00	1115.52	0.000E+00	%	2.038E-04	G
Kr-85		4.7277E-01	513.99	4.728E-01	(	1.481E+00	G
Y-88		0.0000E+00	1836.01	0.000E+00	? P	4.191E-05	G
			898.02	3.788E-05	& P	5.600E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
NB-94	0.0000E+00	871.10	0.000E+00	?	3.514E-05	G
		702.50	4.971E-05	&	6.067E-05	G
Ag-108M	0.0000E+00	722.95	2.625E-05	}	7.328E-05	G
		614.37	0.000E+00	%	6.406E-05	G
		433.93	2.084E-05	&	5.417E-05	G
AG-110M	3.9122E-05	657.75	2.350E-05	(	7.526E-05	G
		884.67	5.148E-05	&(	8.986E-05	G
		937.48	5.602E-05	&(	1.763E-04	G
		1384.27	0.000E+00	%	1.570E-04	G
CD-109	0.0000E+00	88.04	0.000E+00	%	2.016E-03	G
SN-113	0.0000E+00	391.71	0.000E+00	& P	5.845E-05	G
		255.04	0.000E+00	%	1.742E-03	G
SB-125	0.0000E+00	427.95	0.000E+00	&	1.572E-04	G
		600.77	0.000E+00	%	2.229E-04	G
		636.15	0.000E+00	}	5.668E-04	G
		463.51	0.000E+00	%	7.710E-04	G
		176.29	0.000E+00	%	9.947E-04	G
TE-131	0.0000E+00	149.72	0.000E+00	%	7.656E-05	G
		452.32	1.042E-04		2.376E-04	G
		1146.96	5.494E-04		1.540E-03	G
		492.66	4.621E-04	&	9.728E-04	G
TE-132	6.3376E-05	228.16	6.338E-05	&(	5.546E-05	G
		116.30	0.000E+00	}	2.466E-03	G
		111.76	2.432E-03	+	2.935E-03	G
J-131	0.0000E+00	364.48	0.000E+00	%	4.770E-05	G
		636.97	3.426E-04	}	8.746E-04	G
		284.29	2.335E-04	&	5.947E-04	G
CS-134	3.0961E-05	604.66	3.096E-05	(	5.942E-05	G
		795.76	0.000E+00	%	9.552E-05	G
		569.29	1.153E-04	}	3.016E-04	G
		801.84	0.000E+00	?	4.673E-04	G
CS-137	1.1487E-04	661.62	1.149E-04	(	8.068E-05	G
CE-139	0.0000E+00	165.85	0.000E+00	% P	6.280E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-141	4.1019E-05	145.45	4.102E-05	(	1.047E-04		G
CE-144	3.6320E-04	133.53	3.632E-04	&(	4.999E-04		G
		80.12	0.000E+00	&	3.072E-03		G
EU-152	0.0000E+00	121.78	0.000E+00	}	1.821E-04		G
		344.30	0.000E+00	%	1.313E-04		G
		1408.08	2.236E-04	?	2.352E-04		G
		964.00	3.745E-04		6.625E-04		G
		1112.07	0.000E+00	%	7.227E-04		G
		778.90	2.306E-04	&	4.182E-04		G
EU-154	0.0000E+00	123.10	0.000E+00	%	1.357E-04		G
		1274.80	1.722E-04	&	2.003E-04		G
		723.30	0.000E+00	}	3.697E-04		G
		1004.80	1.694E-04	&	3.141E-04		G
EU-155	1.0968E-04	86.45	0.000E+00	}	1.919E-04		G
		105.31	1.097E-04	$(	2.479E-04		G
TA-182	1.8577E-04	67.75	1.858E-04	&(	1.847E-04		G
		1121.28	0.000E+00	&	3.153E-04		G
		1221.42	0.000E+00	%	2.669E-04		G
		1189.05	0.000E+00	%	4.978E-04		G
HG-203	0.0000E+00	279.17	0.000E+00	% P	6.512E-05		G
		72.87	4.070E-04		1.294E-03		G
TL-208	5.4204E-04	583.14	5.352E-04	(	8.859E-05		G
		510.72	5.682E-04	(	3.051E-04		G
PB-212	1.4883E-03	238.63	1.488E-03	(	1.047E-04		G
		77.11	0.000E+00	}	4.993E-04		Energy duplication
		74.81	2.241E-03	}	7.540E-04		G
PB-214	1.0532E-03	351.99	1.030E-03	@(	1.548E-04		G
		295.22	1.098E-03	(	2.455E-04		G
		77.11	2.782E-03	}	6.833E-04		Energy duplication
		241.92	1.053E-03	}	7.405E-04		G
BI-207	1.0548E-04	569.67	0.000E+00	}	5.610E-05		G
		1063.62	1.055E-04	&(	1.033E-04		G
		74.97	0.000E+00	}	2.472E-04		G
BI-212	8.5219E-04	727.17	7.447E-04	(	5.994E-04		G
		1620.56	1.313E-03	?(	1.653E-03		G
		785.42	2.263E-03	+	2.682E-03		G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-214	9.3246E-04	609.32	9.325E-04	(	1.367E-04		G
		1764.51	1.539E-03	+	2.521E-04		G
		1120.28	7.136E-04	-	7.286E-04		G
RA-224	1.1139E-03	241.00	1.114E-03	}(	2.104E-03		G
RA-226	0.0000E+00	185.99	0.000E+00	}	1.531E-03		G
AC-228	1.1993E-03	911.07	1.130E-03	(	2.477E-04		G
		968.90	1.689E-03	+	4.699E-04		G
		338.40	1.366E-03	(	5.539E-04		G
TH-227	3.6165E-04	236.00	3.617E-04	(	4.899E-04		G
		256.25	0.000E+00	%	4.048E-04		G
TH-234	2.2222E-03	63.29	2.222E-03	(	2.587E-03		G
		92.80	2.842E-03	}	2.081E-03		G
		92.38	0.000E+00	}	2.802E-03		G
U-235	3.1221E-04	185.72	3.122E-04	}	1.107E-04		G
		143.76	2.175E-04	(	4.200E-04		G
		205.31	0.000E+00	%	9.197E-04		G
		163.35	5.238E-04	(	9.295E-04		G
NP-237	0.0000E+00	86.49	0.000E+00	}	4.639E-04		G
		95.87	0.000E+00	%	2.020E-03		G
AM-241	1.1111E-04	59.54	1.111E-04	(P	3.608E-04		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
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

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
K-40		1.2789E+01	1.2789E+01	1.6695E+00	1.8192E+00
CR-51	<	1.5657E-01	1.9180E-01		
MN-54	#A	1.6585E-02	1.6886E-02	3.5553E-02	3.5566E-02
MN-56	<	2.50E-02	>12 Halflives		
FE-59	<	3.4057E-02	3.8578E-02		
CO-57	<	2.0044E-01	2.0466E-01		
CO-58	<	2.7075E-02	2.9313E-02		
CO-60	#A	2.9962E-02	3.0050E-02	5.0856E-02	5.0884E-02
Cm-243		2.1410E-01	2.1421E-01	1.5747E-01	1.5794E-01
ZN-65	<	1.0155E-01	1.0392E-01		
Kr-85	A	2.3556E+02	2.3557E+02	6.5508E+02	6.5521E+02
Y-88	<	2.0884E-02	2.2015E-02		
NB-94	<	1.7507E-02	1.7507E-02		
Ag-108M	<	3.1918E-02	3.1922E-02		
AG-110M	A	1.9493E-02	1.9936E-02	2.9604E-02	2.9626E-02
CD-109	<	1.0047E+00	1.0172E+00		
SN-113	<	2.9122E-02	3.0579E-02		
SB-125	<	7.8314E-02	7.8751E-02		
TE-131	<	3.81E-02	>12 Halflives		
TE-132	#	3.1577E-02	1.7845E-01	2.2415E-01	2.2438E-01
J-131	<	2.3765E-02	4.7820E-02		
CS-134	A	1.5427E-02	1.5542E-02	2.7400E-02	2.7414E-02
CS-137		5.7232E-02	5.7262E-02	4.2432E-02	4.2555E-02
CE-139	<	3.1290E-02	3.2596E-02		
CE-141	A	2.0438E-02	2.4313E-02	5.6106E-02	5.6122E-02
CE-144	#A	1.8097E-01	1.8458E-01	3.6095E-01	3.6110E-01
EU-152	<	6.5411E-02	6.5490E-02		
EU-154	<	6.7591E-02	6.7714E-02		
EU-155	A	5.4647E-02	5.4817E-02	1.1244E-01	1.1249E-01
TA-182	#	9.2562E-02	9.7199E-02	1.2455E-01	1.2467E-01
HG-203	<	3.2446E-02	3.6607E-02		
TL-208		2.7007E-01	>12 Halflives	7.1712E-02	7.3318E-02
PB-212		7.4155E-01	>12 Halflives	9.3396E-02	1.0236E-01
PB-214		5.2476E-01	>12 Halflives	9.6020E-02	1.0049E-01
BI-207	#C	5.2554E-02	5.2576E-02	6.2525E-02	6.2596E-02

BI-212		4.2461E-01	>12 Halflives	3.5371E-01	3.5452E-01
BI-214		4.6460E-01	>12 Halflives	1.1273E-01	1.1574E-01
RA-224	#	5.5502E-01	2.5785E+00	3.5242E+03	2.7269E+00
AC-228		5.9756E-01	>12 Halflives	1.8117E-01	1.8429E-01
TH-227	A	1.8020E-01	2.4418E-01	3.0747E-01	3.0778E-01
TH-234	A	1.1072E+00	1.3981E+00	1.5171E+00	1.5191E+00
U-235	A	1.5556E-01	1.5556E-01	1.8649E-01	1.8669E-01
NP-237	<	1.0064E+00	1.0064E+00		
AM-241	A	5.5361E-02	5.5363E-02	1.6166E-01	1.6169E-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 2023.1 keV) 2.5118655E+02 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 2.5373930E+02 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_14DEC2004_1910.An1

Sample description
Detector 101 FSS-OOL-04-01-013-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\101F_14DEC2004_1910.An1

Acquisition information
Start time: 14-Dec-2004 18:59:34
Live time: 2000
Real time: 2003
Dead time: 0.14 %
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: YAEC_OperatingSpectrumRevA.Lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: wan32 G53W2.06
Start channel: 100 (50.23keV)
Stop channel: 4048 (2023.09keV)
Peak rejection level: 100.000%
Peak search sensitivity: 3
Sample Size: 2.1490E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.1490E+03) =
4.6533E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	best method (based on spectrum).

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

Corrections	Status	Comments
Decay correct to date:	YES	03-Dec-2004 08:00:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

Energy Calibration
Normalized diff: 0.1282

********** 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	
173.88	87.06	279.	142.	0.071	56.11	1.014	PB-214	D
179.53	89.88	282.	99.	0.049	78.08	1.016	PB-214	D
307.19	153.79	206.	44.	0.022	145.16	1.061	XE-138	D
402.71	201.51	110.	39.	0.020	123.10	1.095	U-235	D
417.82	209.07	155.	52.	0.026	109.02	1.101	AC-228	D
539.93	270.10	90.	61.	0.031	115.97	1.613	AC-228	s
599.58	299.93	77.	53.	0.027	80.59	1.165	TH-227	D
655.99	328.11	72.	68.	0.034	105.51	1.602	AC-228	s
926.00	463.10	47.	43.	0.021	82.68	1.278	AC-228	D

s - Peak fails shape tests.
D - Peak area deconvoluted.

This section based on library: YAEC_OperatingSpectrumRevA.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
AM-241	118.64	59.54	184.	33.	0.017	178.53	0.994D
TH-234	126.14	63.29	228.	68.	0.034	100.50	0.997D
TA-182	138.39	69.41	497.	53.	0.027	215.67	0.477s
HG-203	145.31	72.87	249.	0.	0.000	0.00	2.050D
PB-212	149.19	74.81	297.	257.	0.128	34.10	1.005D
BI-207	149.51	74.97	554.	0.	0.000	0.00	1.005D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PB-214	153.79	77.11	321.	339.	0.169	27.72	1.006D
PB-212	153.79	77.11	564.	0.	0.000	794.77	0.432D
CE-144	159.81	80.12	287.	0.	0.000	0.00	0.934D
EU-155	172.48	86.45	378.	0.	0.000	0.00	1.013D
NP-237	172.56	86.49	378.	0.	0.000	0.00	1.013D
CD-109	175.66	88.04	424.	13.	0.007	667.67	1.014D
TH-234	184.34	92.38	429.	0.	0.000	0.00	1.017D
TH-234	185.18	92.80	253.	164.	0.082	47.34	1.018D
NP-237	191.32	95.87	244.	17.	0.008	405.83	1.020D
Cm-243	198.69	99.55	255.	53.	0.027	133.94	1.023D
Cm-243	207.11	103.76	268.	32.	0.016	219.93	1.026D
EU-155	210.21	105.31	238.	60.	0.030	115.16	1.027D
TE-132	224.31	112.36	196.	117.	0.058	84.93	0.994s
TE-132	230.75	115.57	203.	58.	0.029	161.22	1.932s
Cm-243	233.60	117.00	104.	0.	0.000	0.00	0.928D
EU-152	243.16	121.78	208.	9.	0.005	683.33	1.038D
CO-57	243.74	122.07	214.	3.	0.001	1523.93	1.039D
EU-154	245.80	123.10	223.	0.	0.000	0.00	1.039D
CE-144	266.67	133.53	120.	30.	0.015	161.73	1.047D
CO-57	272.48	136.43	192.	22.	0.011	275.87	1.049D
U-235	287.14	143.76	194.	45.	0.023	138.47	1.054D
CE-141	290.52	145.45	261.	19.	0.009	375.66	1.055D
TE-131	299.07	149.72	282.	0.	0.000	0.00	1.058D
U-235	326.34	163.35	192.	31.	0.015	199.30	1.068D
CE-139	331.34	165.85	175.	5.	0.003	1065.92	1.070D
SB-125	352.65	176.50	192.	52.	0.026	183.53	1.206s
U-235	371.10	185.72	256.	246.	0.123	6.04	1.084A
RA-226	371.64	185.99	172.	0.	0.000	5564.17	0.978A
U-235	410.29	205.31	115.	0.	0.000	0.00	1.163D
TE-132	456.00	228.16	133.	11.	0.005	504.51	0.168s
TH-227	471.70	236.00	191.	5.	0.003	1139.20	1.120D
PB-212	476.96	238.63	141.	571.	0.285	15.35	1.122D
RA-224	481.70	241.00	136.	49.	0.024	110.00	1.378A
PB-214	483.54	241.92	169.	75.	0.037	8.63	1.124A
SN-113	509.79	255.04	108.	0.	0.000	0.00	0.588D
TH-227	509.81	255.05	108.	42.	0.021	180.14	0.588s
Cm-243	554.93	277.60	94.	29.	0.015	152.20	1.149D
HG-203	558.07	279.17	82.	0.	0.000	0.00	1.150D
J-131	566.88	283.57	54.	25.	0.013	186.29	1.493s
PB-214	590.19	295.22	78.	179.	0.090	30.59	1.161D
CR-51	639.19	319.71	45.	9.	0.004	331.66	0.562s
AC-228	675.88	338.05	108.	121.	0.060	53.54	1.491s
EU-152	686.52	343.37	36.	21.	0.010	183.50	1.057
PB-214	703.64	351.92	72.	248.	0.124	25.32	1.149
J-131	729.00	364.60	16.	0.	0.000	0.00	0.000s
SN-113	787.30	393.73	37.	39.	0.019	115.70	0.605s
SB-125	856.00	428.07	12.	0.	0.000	0.00	0.000s
Ag-108M	870.48	435.30	42.	5.	0.002	629.29	0.563s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TE-131	904.18	452.15	38.	20.	0.010	173.64	1.454s
SB-125	926.92	463.51	76.	8.	0.004	448.71	1.278D
TE-131	983.50	491.79	30.	11.	0.005	245.81	0.481s
TL-208	1021.38	510.72	56.	55.	0.027	71.07	1.310D
Kr-85	1027.92	513.99	43.	15.	0.008	197.51	1.313D
CS-134	1138.58	569.29	43.	4.	0.002	790.75	1.351D
BI-207	1139.34	569.67	39.	9.	0.004	315.36	1.351D
TL-208	1166.30	583.14	46.	164.	0.082	32.04	1.082
SB-125	1201.57	600.77	10.	0.	0.000	0.00	0.000D
CS-134	1209.35	604.66	36.	6.	0.003	478.48	1.374D
BI-214	1218.68	609.32	30.	218.	0.109	22.95	1.378D
Ag-108M	1228.78	614.37	31.	11.	0.005	237.60	1.381D
SB-125	1272.36	636.15	23.	0.	0.000	0.00	0.562D
J-131	1272.40	636.17	24.	19.	0.010	145.74	1.199s
AG-110M	1315.58	657.75	24.	4.	0.002	604.15	1.410D
CS-137	1323.33	661.62	14.	11.	0.005	177.17	1.413D
NB-94	1407.43	703.65	32.	1.	0.001	2083.87	0.562s
Ag-108M	1446.05	722.95	26.	6.	0.003	372.12	1.454D
EU-154	1446.75	723.30	18.	0.	0.000	0.00	0.000D
BI-212	1454.49	727.17	24.	54.	0.027	55.93	1.457D
EU-152	1558.14	778.97	40.	12.	0.006	288.58	0.493s
BI-212	1571.76	785.77	28.	13.	0.007	227.28	0.652s
CS-134	1591.75	795.76	26.	18.	0.009	140.72	1.502D
CS-134	1603.91	801.84	24.	3.	0.001	806.53	1.506D
CO-58	1623.56	811.66	10.	10.	0.005	179.33	0.796s
MN-54	1668.00	833.87	16.	11.	0.005	189.61	0.666s
MN-56	1692.56	846.14	10.	14.	0.007	140.11	0.757s
NB-94	1743.25	871.47	12.	8.	0.004	225.00	0.536s
AG-110M	1768.60	884.14	11.	3.	0.002	500.00	0.558s
Y-88	1798.00	898.83	4.	1.	0.000	483.74	0.000s
AC-228	1822.77	911.21	29.	97.	0.048	44.35	1.473
AG-110M	1874.92	937.27	9.	2.	0.001	526.64	0.409s
EU-152	1928.41	964.00	34.	9.	0.005	289.40	1.612D
AC-228	1938.21	968.90	25.	65.	0.032	49.56	1.616D
EU-154	2010.00	1004.77	7.	1.	0.001	793.73	0.000s
BI-207	2125.83	1062.66	28.	15.	0.007	208.17	0.562s
FE-59	2198.27	1098.85	7.	2.	0.001	670.82	0.352s
EU-152	2224.72	1112.07	31.	6.	0.003	380.73	1.708D
ZN-65	2231.62	1115.52	35.	5.	0.002	576.31	1.710D
BI-214	2241.15	1120.28	25.	62.	0.031	51.29	1.713D
TA-182	2243.15	1121.28	84.	0.	0.000	0.00	0.000D
TE-131	2294.61	1146.99	30.	19.	0.009	175.82	0.658s
CO-60	2346.72	1173.03	31.	0.	0.000	361.78	0.661s
TA-182	2378.48	1188.90	21.	4.	0.002	563.75	0.589s
TA-182	2440.15	1219.72	21.	4.	0.002	563.75	0.531s
EU-154	2551.00	1275.11	7.	1.	0.000	1077.03	0.000s
FE-59	2584.52	1291.86	8.	11.	0.005	161.35	0.841s
CO-60	2668.51	1333.83	18.	0.	0.000	0.00	0.828s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AG-110M	2768.15	1383.62	1.	2.	0.001	341.73	0.445s
EU-152	2817.18	1408.12	8.	13.	0.007	150.15	1.668
K-40	2921.70	1460.34	4.	634.	0.317	12.09	1.777
BI-212	3241.17	1619.97	0.	8.	0.004	106.07	0.874s
BI-214	3529.88	1764.22	0.	42.	0.021	46.29	1.756
MN-56	3622.00	1810.25	0.	0.	0.000	0.00	0.000s
Y-88	3676.38	1837.42	1.	4.	0.002	197.38	0.919s

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 microCi	Peak Energy keV	Peak Activity microCi	Peak Code	Peak MDA Value microCi	Comments
K-40		2.7219E-02	1460.75	2.722E-02	(	5.079E-04	G
CR-51		0.0000E+00	320.07	0.000E+00	%	3.900E-04	G
MN-54		3.0941E-05	834.81	3.094E-05	&(	6.005E-05	G
MN-56		3.8831E-05	846.60	3.883E-05	(	5.123E-05	G
			1811.20	0.000E+00	?	1.512E-04	G
FE-59		0.0000E+00	1099.22	0.000E+00	%	9.718E-05	G
			1291.56	1.050E-04		1.516E-04	G
CO-57		1.3338E-04	122.07	0.000E+00	} P	5.293E-05	G
			136.43	1.334E-04	(	4.096E-04	G
CO-58		2.6170E-05	810.75	2.617E-05	&(	4.906E-05	G
CO-60		0.0000E+00	1332.51	0.000E+00	& P	9.634E-05	G
			1173.23	0.000E+00	% P	1.084E-04	G
Cm-243		2.2575E-04	277.60	2.055E-04	(	3.389E-04	G
			117.00	0.000E+00	}	2.968E-04	G
			103.76	9.226E-05	-	2.241E-04	G
			99.55	2.455E-04	$(	3.563E-04	G
ZN-65		0.0000E+00	1115.52	0.000E+00	%	2.178E-04	G
Kr-85		6.3514E-01	513.99	6.351E-01	(	1.382E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Y-88	2.0398E-05	1836.01	2.040E-05	&(P	4.692E-05		G
		898.02	0.000E+00	& P	3.889E-05		G
NB-94	2.3366E-05	871.10	2.337E-05	(	5.507E-05		G
		702.50	0.000E+00	&	6.960E-05		G
Ag-108M	2.5380E-05	722.95	0.000E+00	}	7.232E-05		G
		614.37	2.538E-05	(	6.752E-05		G
		433.93	0.000E+00	&	5.561E-05		G
AG-110M	0.0000E+00	657.75	0.000E+00	%	6.148E-05		G
		884.67	0.000E+00	%	7.383E-05		G
		937.48	0.000E+00	%	1.492E-04		G
		1384.27	0.000E+00	%	1.393E-04		G
CD-109	0.0000E+00	88.04	0.000E+00	%	1.820E-03		G
SN-113	8.3039E-05	391.71	8.304E-05	&(P	6.663E-05		G
		255.04	0.000E+00	!	2.266E-03		G
SB-125	0.0000E+00	427.95	0.000E+00	?	9.542E-05		G
		600.77	0.000E+00	?	1.972E-04		G
		636.15	0.000E+00	}	4.941E-04		G
		463.51	0.000E+00	%	7.001E-04		G
		176.29	5.827E-04	*	7.540E-04		G
TE-131	0.0000E+00	149.72	0.000E+00	%	7.751E-05		G
		452.32	1.736E-04	*	2.729E-04		G
		1146.96	1.424E-03	?	2.115E-03		G
		492.66	3.791E-04	&	1.009E-03		G
TE-132	0.0000E+00	228.16	0.000E+00	%	5.346E-05		G
		116.30	1.904E-03	}	2.268E-03		G
		111.76	4.064E-03	&	2.360E-03		G
J-131	0.0000E+00	364.48	0.000E+00	?	3.363E-05		G
		636.97	5.794E-04	}	7.696E-04		G
		284.29	4.169E-04	&	6.162E-04		G
CS-134	0.0000E+00	604.66	0.000E+00	%	6.611E-05		G
		795.76	5.632E-05		8.372E-05		G
		569.29	0.000E+00	}	4.278E-04		G
		801.84	0.000E+00	%	7.985E-04		G
CS-137	2.8578E-05	661.62	2.858E-05	(	5.481E-05		G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-139	0.0000E+00	165.85	0.000E+00	% P	5.512E-05		G
CE-141	0.0000E+00	145.45	0.000E+00	%	1.064E-04		G
CE-144	1.8133E-04	133.53	1.813E-04	(	3.195E-04		G
		80.12	0.000E+00	&	3.845E-03		G
EU-152	1.8882E-04	121.78	0.000E+00	}	1.528E-04		G
		344.30	9.417E-05	&(	1.375E-04		G
		1408.08	2.725E-04	(	3.331E-04		G
		964.00	1.992E-04	(	6.538E-04		G
		1112.07	0.000E+00	%	7.582E-04		G
		778.90	2.373E-04	(	6.572E-04		G
EU-154	0.0000E+00	123.10	0.000E+00	%	1.142E-04		G
		1274.80	0.000E+00	%	1.760E-04		G
		723.30	0.000E+00	}	2.785E-04		G
		1004.80	0.000E+00	%	2.774E-04		G
EU-155	1.7968E-04	86.45	0.000E+00	}	2.017E-04		G
		105.31	1.797E-04	$(	2.222E-04		G
TA-182	1.2663E-04	67.75	1.266E-04	&(	2.538E-04		G
		1121.28	0.000E+00	?	4.729E-04		G
		1221.42	0.000E+00	&	3.448E-04		G
		1189.05	0.000E+00	%	5.611E-04		G
HG-203	0.0000E+00	279.17	0.000E+00	% P	5.461E-05		G
		72.87	0.000E+00	&	1.013E-03		G
TL-208	3.9612E-04	583.14	3.867E-04	(	8.026E-05		G
		510.72	4.321E-04	(	2.983E-04		G
PB-212	1.1490E-03	238.63	1.149E-03	(	1.170E-04		G
		77.11	0.000E+00	}	5.089E-04		Energy duplication
		74.81	2.185E-03	}	7.069E-04		G
PB-214	8.7886E-04	351.99	8.280E-04	(	1.406E-04		G
		295.22	9.771E-04	(	2.384E-04		G
		77.11	2.488E-03	}	6.328E-04		Energy duplication
		241.92	8.789E-04	}	7.428E-04		G
BI-207	6.7807E-05	569.67	0.000E+00	}	6.427E-05		G
		1063.62	6.781E-05	&(	1.237E-04		G
		74.97	0.000E+00	}	2.372E-04		G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-212	1.2649E-03	727.17	1.139E-03	(	5.360E-04		G
		1620.56	1.466E-03	?(	1.350E-03		G
		785.42	1.731E-03	(	3.643E-03		G
BI-214	9.9603E-04	609.32	9.960E-04	(	1.291E-04		G
		1764.51	1.437E-03	+	2.521E-04		G
		1120.28	1.489E-03	+	6.246E-04		G
RA-224	1.0957E-03	241.00	1.096E-03	}(	2.065E-03		G
RA-226	0.0000E+00	185.99	0.000E+00	}	1.415E-03		G
AC-228	1.1044E-03	911.07	1.013E-03	(	2.929E-04		G
		968.90	1.193E-03	(	4.785E-04		G
		338.40	1.196E-03	*(	5.077E-04		G
TH-227	0.0000E+00	236.00	0.000E+00	%	5.150E-04		G
		256.25	5.689E-04	&	6.927E-04		G
TH-234	2.1146E-03	63.29	2.115E-03	(	2.261E-03		G
		92.80	3.715E-03	}	1.740E-03		G
		92.38	0.000E+00	}	2.629E-03		G
U-235	3.3088E-04	185.72	3.309E-04	}	1.040E-04		G
		143.76	2.800E-04	(	4.200E-04		G
		205.31	0.000E+00	&	8.682E-04		G
		163.35	4.445E-04	(	9.756E-04		G
NP-237	0.0000E+00	86.49	0.000E+00	}	5.039E-04		G
		95.87	0.000E+00	%	1.709E-03		G
AM-241	1.4536E-04	59.54	1.454E-04	(P	2.869E-04		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
K-40		1.2666E+01	1.2666E+01	1.5308E+00	1.6898E+00
CR-51	<	1.8150E-01	2.4176E-01		
MN-54	#A	1.4398E-02	1.4769E-02	2.8003E-02	2.8015E-02
MN-56	A	1.8069E-02	>12 Halflives	2.5316E-02	2.5337E-02
FE-59	<	4.5223E-02	5.3931E-02		
CO-57	A	6.2068E-02	6.3921E-02	1.7634E-01	1.7637E-01
CO-58	#A	1.2178E-02	1.3624E-02	2.4432E-02	2.4444E-02
CO-60	<	4.4830E-02	4.5015E-02		
Cm-243	A	1.0505E-01	1.0512E-01	1.0656E-01	1.0673E-01
ZN-65	<	1.0135E-01	1.0471E-01		
Kr-85	A	2.9555E+02	2.9558E+02	5.8380E+02	5.8404E+02
Y-88	#A	9.4918E-03	1.0226E-02	2.1572E-02	2.1580E-02
NB-94	A	1.0873E-02	1.0873E-02	2.4465E-02	2.4472E-02
Ag-108M	A	1.1810E-02	1.1812E-02	2.8066E-02	2.8074E-02
AG-110M	<	2.8608E-02	2.9532E-02		
CD-109	<	8.4698E-01	8.6195E-01		
SN-113	#	3.8641E-02	4.1401E-02	4.9384E-02	4.9440E-02
SB-125	<	4.4400E-02	4.4750E-02		
TE-131	<	3.61E-02	>12 Halflives		
TE-132	<	2.4878E-02	2.8735E-01		
J-131	<	1.5650E-02	4.2026E-02		
CS-134	<	3.0765E-02	3.1091E-02		
CS-137	A	1.3298E-02	1.3308E-02	2.3578E-02	2.3590E-02
CE-139	<	2.5649E-02	2.7174E-02		
CE-141	<	4.9506E-02	6.3267E-02		
CE-144	A	8.4378E-02	8.6769E-02	1.4033E-01	1.4041E-01
EU-152	C	8.7866E-02	8.8017E-02	1.0397E-01	1.0409E-01
EU-154	<	5.3133E-02	5.3269E-02		
EU-155	A	8.3613E-02	8.3981E-02	9.6716E-02	9.6828E-02
TA-182	#A	5.8923E-02	6.3137E-02	1.3617E-01	1.3621E-01

HG-203	<	2.5410E-02	3.0133E-02

TL-208		1.8433E-01	>12 Halflives	5.9051E-02	5.9962E-02
PB-212		5.3469E-01	>12 Halflives	8.2101E-02	8.7483E-02
PB-214		4.0896E-01	>12 Halflives	8.1210E-02	8.4434E-02
BI-207	#A	3.1553E-02	3.1571E-02	6.5720E-02	6.5744E-02
BI-212		5.8858E-01	>12 Halflives	3.2919E-01	3.3086E-01
BI-214		4.6348E-01	>12 Halflives	1.0639E-01	1.0957E-01
RA-224	#	5.0984E-01	4.4652E+00	6.3958E+03	4.9183E+00
AC-228		5.1393E-01	>12 Halflives	1.4626E-01	1.4912E-01
TH-227	<	2.3966E-01	3.6817E-01		
TH-234	A	9.8401E-01	1.3681E+00	1.3749E+00	1.3770E+00
U-235	A	1.5397E-01	1.5397E-01	1.8683E-01	1.8702E-01
NP-237	<	7.9521E-01	7.9521E-01		
AM-241	A	6.7640E-02	6.7643E-02	1.2170E-01	1.2176E-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 2023.1 keV) 3.1055774E+02 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 3.1493661E+02 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_14DEC2004_1945.An1

Sample description
Detector 101 FSS-OOL-04-01-022-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\101F_14DEC2004_1945.An1

Acquisition information

Start time:	14-Dec-2004 19:36:21
Live time:	2000
Real time:	2003
Dead time:	0.14 %
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:	YAEC_OperatingSpectrumRevA.Lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters

Analysis engine:	wan32 G53W2.06
Start channel:	100 (50.23keV)
Stop channel:	4048 (2023.09keV)
Peak rejection level:	100.000%
Peak search sensitivity:	3
Sample Size:	1.8200E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.8200E+03) = 5.4945E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	best method (based on spectrum).

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

Corrections	Status	Comments
Decay correct to date:	YES	06-Dec-2004 11:25:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

Energy Calibration
Normalized diff: 0.1929

********** 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	
173.94	87.16	217.	124.	0.062	57.21	1.014	PB-214	D
179.48	89.93	244.	152.	0.076	49.93	1.016	PB-214	D
228.59	114.64	207.	39.	0.020	161.73	1.033	PA-234	D
307.56	154.07	178.	82.	0.041	76.11	1.061	XE-138	D
324.68	162.56	121.	53.	0.026	97.90	1.068	BA-140	D
418.54	209.25	155.	73.	0.037	80.03	1.101	AC-228	D
540.00	270.14	95.	74.	0.037	102.88	1.230	AC-228	s

s - Peak fails shape tests.
D - Peak area deconvoluted.

This section based on library: YAEC_OperatingSpectrumRevA.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
AM-241	118.64	59.54	174.	29.	0.014	202.22	0.994D
TH-234	126.14	63.29	283.	42.	0.021	175.32	0.996D
TA-182	134.05	67.24	324.	102.	0.051	127.66	3.345s
HG-203	145.31	72.87	347.	26.	0.013	304.98	1.003D
PB-212	149.19	74.81	340.	168.	0.084	51.89	1.005D
BI-207	149.51	74.97	469.	39.	0.019	241.16	1.005D
PB-214	153.79	77.11	287.	383.	0.191	24.27	1.006D
PB-212	153.79	77.11	535.	0.	0.000	1002.05	0.000D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CE-144	159.81	80.12	193.	26.	0.013	233.79	1.009D
EU-155	172.48	86.45	300.	0.	0.000	0.00	1.013D
NP-237	172.56	86.49	283.	17.	0.009	424.73	1.013D
CD-109	175.66	88.04	370.	35.	0.017	241.46	1.014D
TH-234	184.34	92.38	356.	48.	0.024	174.13	1.017D
TH-234	185.18	92.80	309.	90.	0.045	88.88	1.018D
NP-237	191.32	95.87	248.	35.	0.018	196.10	1.020D
Cm-243	198.69	99.55	258.	41.	0.021	170.64	1.023D
Cm-243	207.11	103.76	274.	25.	0.012	290.58	1.026D
EU-155	210.21	105.31	262.	36.	0.018	194.78	1.027D
TE-132	223.12	111.76	145.	40.	0.020	135.93	1.031D
TE-132	232.20	116.30	251.	0.	0.000	0.00	1.034D
Cm-243	233.60	117.00	182.	25.	0.012	239.27	1.035D
EU-152	243.16	121.78	235.	5.	0.003	1276.84	1.038D
CO-57	243.74	122.07	234.	6.	0.003	933.28	1.039D
EU-154	245.80	123.10	198.	19.	0.009	329.81	1.039D
CE-144	266.67	133.53	137.	0.	0.000	43362.50	1.047D
CO-57	272.48	136.43	180.	35.	0.018	169.01	1.049D
U-235	287.14	143.76	213.	28.	0.014	224.41	1.054D
CE-141	290.52	145.45	208.	20.	0.010	318.42	1.055D
TE-131	299.07	149.72	236.	21.	0.010	323.43	1.058D
U-235	326.34	163.35	224.	0.	0.000	0.00	1.068D
CE-139	331.34	165.85	159.	18.	0.009	302.71	1.070D
SB-125	348.91	174.63	163.	28.	0.014	211.81	0.596s
U-235	371.10	185.72	217.	131.	0.066	11.17	1.084A
RA-226	371.64	185.99	140.	0.	0.000	5019.96	1.491A
U-235	410.29	205.31	75.	5.	0.002	776.17	1.098D
TE-132	459.02	229.67	120.	75.	0.038	112.78	2.539s
TH-227	471.70	236.00	128.	6.	0.003	803.94	1.120D
PB-212	476.96	238.63	133.	769.	0.384	12.55	1.122D
RA-224	481.70	241.00	164.	37.	0.019	153.07	1.517A
PB-214	483.54	241.92	165.	63.	0.032	12.44	1.124A
SN-113	509.79	255.04	74.	0.	0.000	0.00	1.455D
TH-227	509.35	254.82	74.	30.	0.015	186.95	1.455s
Cm-243	554.93	277.60	79.	44.	0.022	97.30	1.149D
HG-203	558.07	279.17	91.	13.	0.006	234.98	1.150D
J-131	568.83	284.54	54.	69.	0.034	91.92	3.338s
PB-214	590.18	295.22	114.	129.	0.065	49.28	0.898
CR-51	635.85	318.04	51.	13.	0.007	258.07	0.954
AC-228	676.16	338.19	82.	114.	0.057	47.26	1.167
EU-152	689.91	345.06	40.	42.	0.021	119.95	3.154s
PB-214	703.75	351.98	84.	230.	0.115	29.14	1.154
J-131	730.22	365.21	45.	11.	0.005	303.50	1.515s
SN-113	782.20	391.18	12.	0.	0.000	0.00	0.333s
SB-125	856.78	428.46	33.	41.	0.021	116.96	2.464s
Ag-108M	868.00	434.07	13.	0.	0.000	0.00	0.000s
TE-131	903.27	451.69	45.	21.	0.010	169.63	0.572s
SB-125	926.34	463.22	32.	42.	0.021	79.27	1.509

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TE-131	984.00	492.04	9.	0.	0.000	0.00	0.083s
TL-208	1021.21	510.63	40.	88.	0.044	49.17	2.217s
Kr-85	1027.95	514.00	50.	0.	0.000	0.00	1.313
CS-134	1138.49	569.25	29.	0.	0.000	0.00	1.350
BI-207	1138.43	569.22	20.	9.	0.005	236.31	1.168
TL-208	1166.13	583.06	30.	221.	0.111	23.94	1.175
SB-125	1201.57	600.77	30.	11.	0.005	230.37	1.372D
CS-134	1209.35	604.66	39.	5.	0.002	583.88	1.374D
BI-214	1218.68	609.32	26.	163.	0.081	27.02	1.378D
Ag-108M	1228.78	614.37	18.	0.	0.000	0.00	0.764D
SB-125	1271.61	635.77	22.	12.	0.006	214.72	0.620s
J-131	1274.00	636.97	12.	0.	0.000	0.00	0.000D
AG-110M	1315.52	657.72	7.	0.	0.000	0.00	1.410
CS-137	1322.40	661.15	24.	34.	0.017	90.84	1.487s
NB-94	1404.00	701.94	8.	0.	0.000	0.00	0.111s
Ag-108M	1446.05	722.95	23.	5.	0.003	389.13	1.454D
EU-154	1446.75	723.30	35.	0.	0.000	0.00	1.454D
BI-212	1454.49	727.17	26.	37.	0.018	77.23	1.457D
EU-152	1559.56	779.67	18.	18.	0.009	138.53	0.639s
BI-212	1572.67	786.23	24.	14.	0.007	198.72	1.182s
CS-134	1591.75	795.76	27.	7.	0.004	322.46	1.502D
CS-134	1603.91	801.84	16.	2.	0.001	830.46	1.506D
CO-58	1623.00	811.38	7.	0.	0.000	0.00	0.000s
MN-54	1670.86	835.29	7.	3.	0.002	354.96	0.389s
MN-56	1690.57	845.14	13.	8.	0.004	243.67	0.462s
NB-94	1740.27	869.98	18.	16.	0.008	156.87	3.801s
AG-110M	1768.67	884.17	8.	2.	0.001	723.11	0.362s
Y-88	1796.00	897.83	11.	1.	0.001	648.07	0.000s
AC-228	1821.99	910.82	28.	128.	0.064	34.13	1.597s
AG-110M	1876.67	938.14	5.	2.	0.001	584.81	0.372s
EU-152	1928.41	964.00	31.	18.	0.009	151.00	1.612D
AC-228	1938.21	968.90	21.	74.	0.037	43.59	1.616D
EU-154	2010.32	1004.93	14.	4.	0.002	523.14	0.604s
BI-207	2123.60	1061.54	15.	4.	0.002	483.15	0.584s
FE-59	2200.90	1100.17	22.	20.	0.010	139.15	1.936
EU-152	2224.72	1112.07	13.	2.	0.001	956.00	1.708D
ZN-65	2231.62	1115.52	28.	6.	0.003	399.53	1.710D
BI-214	2241.15	1120.28	34.	32.	0.016	93.23	1.713D
TA-182	2243.15	1121.28	32.	0.	0.000	0.00	0.673D
TE-131	2292.63	1146.00	10.	4.	0.002	369.68	0.406s
CO-60	2344.18	1171.77	29.	0.	0.000	0.00	0.391s
TA-182	2373.00	1186.17	18.	10.	0.005	243.60	0.555s
TA-182	2445.26	1222.27	15.	10.	0.005	193.79	1.886
EU-154	2549.92	1274.57	8.	4.	0.002	335.41	1.306
FE-59	2584.00	1291.60	11.	1.	0.001	1152.17	0.000s
CO-60	2665.47	1332.31	8.	9.	0.004	87.01	1.330
AG-110M	2769.33	1384.21	1.	0.	0.000	360.56	0.394s
EU-152	2816.00	1407.53	0.	0.	0.000	0.00	0.000s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
K-40	2921.57	1460.28	6.	583.	0.292	12.68	1.873
BI-212	3240.00	1619.38	2.	2.	0.001	367.42	0.167s
BI-214	3529.55	1764.05	0.	22.	0.011	63.96	0.999s
MN-56	3623.00	1810.75	0.	1.	0.001	300.00	0.500s
Y-88	3672.00	1835.23	0.	0.	0.000	0.00	0.000s

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 microCi	Peak Energy keV	Peak Activity microCi	Peak Code	Peak MDA Value microCi	Comments
K-40		2.5023E-02	1460.75	2.502E-02	(	6.062E-04	G
CR-51		1.5309E-04	320.07	1.531E-04	&(	4.120E-04	G
MN-54		0.0000E+00	834.81	0.000E+00	%	4.147E-05	G
MN-56		2.2052E-05	846.60	2.205E-05	&(	5.674E-05	G
			1811.20	0.000E+00	%	1.512E-04	G
FE-59		1.2891E-04	1099.22	1.289E-04	&(	1.547E-04	G
			1291.56	0.000E+00	%	1.711E-04	G
CO-57		2.1466E-04	122.07	0.000E+00	} P	5.527E-05	G
			136.43	2.147E-04	$(	3.968E-04	G
CO-58		0.0000E+00	810.75	0.000E+00	%	4.061E-05	G
CO-60		3.7538E-05	1332.51	3.754E-05	?(P	6.781E-05	G
			1173.23	0.000E+00	& P	1.048E-04	G
Cm-243		2.5031E-04	277.60	3.103E-04	(	3.127E-04	G
			117.00	1.465E-04	}	3.886E-04	G
			103.76	7.018E-05	-	2.268E-04	G
			99.55	1.916E-04	(	3.581E-04	G
ZN-65		0.0000E+00	1115.52	0.000E+00	%	1.959E-04	G
Kr-85		0.0000E+00	513.99	0.000E+00		1.486E+00	G
Y-88		0.0000E+00	1836.01	0.000E+00	? P	4.191E-05	G
			898.02	0.000E+00	% P	5.754E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	4.6733E-05	871.10	4.673E-05	&(		6.566E-05	G
		702.50	0.000E+00	?		3.822E-05	G
Ag-108M	0.0000E+00	722.95	0.000E+00	}		6.774E-05	G
		614.37	0.000E+00	!		5.325E-05	G
		433.93	0.000E+00	?		3.297E-05	G
AG-110M	0.0000E+00	657.75	0.000E+00			3.593E-05	G
		884.67	0.000E+00	%		6.514E-05	G
		937.48	0.000E+00	%		1.224E-04	G
		1384.27	0.000E+00	%		1.326E-04	G
CD-109	6.3837E-04	88.04	6.384E-04	(		1.705E-03	G
SN-113	0.0000E+00	391.71	0.000E+00	?	P	4.063E-05	G
		255.04	0.000E+00	!		1.891E-03	G
SB-125	2.6595E-04	427.95	2.075E-04	*(		1.492E-04	G
		600.77	1.240E-04	(		3.192E-04	G
		636.15	2.253E-04	}		4.862E-04	G
		463.51	6.723E-04	(		4.676E-04	G
		176.29	3.100E-04	&(		6.978E-04	G
TE-131	0.0000E+00	149.72	0.000E+00	%		7.119E-05	G
		452.32	1.823E-04			2.949E-04	G
		1146.96	0.000E+00	&		1.334E-03	G
		492.66	0.000E+00	?		5.932E-04	G
TE-132	7.0943E-05	228.16	7.094E-05	&(		5.085E-05	G
		116.30	0.000E+00	}		2.512E-03	G
		111.76	1.393E-03	+		2.043E-03	G
J-131	0.0000E+00	364.48	0.000E+00	&		5.369E-05	G
		636.97	0.000E+00	}		5.699E-04	G
		284.29	1.151E-03	*		6.162E-04	G
CS-134	0.0000E+00	604.66	0.000E+00	%		6.844E-05	G
		795.76	0.000E+00	%		8.458E-05	G
		569.29	0.000E+00	}		3.561E-04	G
		801.84	0.000E+00	%		6.615E-04	G
CS-137	9.1448E-05	661.62	9.145E-05	(		6.869E-05	G
CE-139	0.0000E+00	165.85	0.000E+00	%	P	5.267E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
CE-141	0.0000E+00	145.45	0.000E+00	%	9.537E-05	G
CE-144	0.0000E+00	133.53	0.000E+00	%	3.408E-04	G
		80.12	1.226E-03		3.176E-03	G
EU-152	2.8288E-04	121.78	0.000E+00	}	1.620E-04	G
		344.30	1.883E-04	&(	1.443E-04	G
		1408.08	0.000E+00	?	1.545E-04	G
		964.00	3.898E-04	$(	6.296E-04	G
		1112.07	0.000E+00	%	5.263E-04	G
		778.90	3.594E-04	&(	4.610E-04	G
EU-154	0.0000E+00	123.10	0.000E+00	%	1.080E-04	G
		1274.80	0.000E+00	%	1.824E-04	G
		723.30	0.000E+00	}	3.797E-04	G
		1004.80	0.000E+00	%	3.732E-04	G
EU-155	1.0858E-04	86.45	0.000E+00	}	1.803E-04	G
		105.31	1.086E-04	$(	2.327E-04	G
TA-182	2.0901E-04	67.75	2.429E-04	&(	2.062E-04	G
		1121.28	0.000E+00	%	3.027E-04	G
		1221.42	1.481E-04	?(	2.945E-04	G
		1189.05	2.254E-04	&(	5.284E-04	G
HG-203	0.0000E+00	279.17	0.000E+00	% P	5.764E-05	G
		72.87	0.000E+00	%	1.188E-03	G
TL-208	5.1951E-04	583.14	5.195E-04	(	6.637E-05	G
		510.72	6.963E-04	+	2.546E-04	G
PB-212	1.5472E-03	238.63	1.547E-03	(	1.136E-04	G
		77.11	0.000E+00	}	4.960E-04	Energy duplication
		74.81	1.433E-03	}	7.540E-04	G
PB-214	7.4451E-04	351.99	7.652E-04	(	1.519E-04	G
		295.22	7.045E-04	(	2.854E-04	G
		77.11	2.808E-03	}	5.999E-04	Energy duplication
		241.92	7.445E-04	}	7.350E-04	G
BI-207	0.0000E+00	569.67	1.849E-05	}	4.734E-05	G
		1063.62	0.000E+00	&	9.384E-05	G
		74.97	8.206E-05	}	2.187E-04	G
BI-212	7.7233E-04	727.17	7.723E-04	(	5.598E-04	G
		1620.56	0.000E+00	&	1.704E-03	G
		785.42	1.864E-03	&	3.400E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
BI-214	7.5292E-04	609.32	7.447E-04	(	1.213E-04	G
		1764.51	7.526E-04	(	2.521E-04	G
		1120.28	7.785E-04	(	7.221E-04	G
RA-224	8.4032E-04	241.00	8.403E-04	}(	2.138E-03	G
RA-226	0.0000E+00	185.99	0.000E+00	}	1.283E-03	G
AC-228	1.3030E-03	911.07	1.341E-03	(	2.868E-04	G
		968.90	1.362E-03	(	4.413E-04	G
		338.40	1.125E-03	(	4.465E-04	G
TH-227	0.0000E+00	236.00	0.000E+00	%	4.255E-04	G
		256.25	4.131E-04	&	5.779E-04	G
TH-234	1.3059E-03	63.29	1.306E-03	(	2.510E-03	G
		92.80	2.034E-03	}	1.917E-03	G
		92.38	1.259E-03	}	2.403E-03	G
U-235	1.7686E-04	185.72	1.769E-04	}	9.601E-05	G
		143.76	1.769E-04	$(	4.389E-04	G
		205.31	0.000E+00	%	7.105E-04	G
		163.35	0.000E+00	!	1.050E-03	G
NP-237	7.9711E-04	86.49	0.000E+00	}	4.380E-04	G
		95.87	7.971E-04	(	1.720E-03	G
AM-241	1.2427E-04	59.54	1.243E-04	(P	2.797E-04	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
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

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
K-40		1.3749E+01	1.3749E+01	1.7431E+00	1.9084E+00
CR-51	A	8.4115E-02	1.0364E-01	2.6746E-01	2.6753E-01
MN-54	<	2.2784E-02	2.3210E-02		
MN-56	#A	1.2117E-02	>12 Halflives	2.9525E-02	2.9533E-02
FE-59	A	7.0829E-02	8.0517E-02	1.1204E-01	1.1213E-01
CO-57	A	1.1794E-01	1.2050E-01	2.0365E-01	2.0376E-01
CO-58	<	2.2313E-02	2.4213E-02		
CO-60	#A	2.0625E-02	2.0687E-02	3.1151E-02	3.1173E-02
Cm-243	A	1.3753E-01	1.3760E-01	1.3388E-01	1.3411E-01
ZN-65	<	1.0765E-01	1.1023E-01		
Kr-85	<	8.1628E+02	8.1633E+02		
Y-88	<	2.3030E-02	2.4313E-02		
NB-94	#A	2.5677E-02	2.5677E-02	4.0281E-02	4.0307E-02
Ag-108M	<	2.9256E-02	2.9259E-02		
AG-110M	<	1.9743E-02	2.0205E-02		
CD-109	A	3.5075E-01	3.5525E-01	8.5781E-01	8.5804E-01
SN-113	<	2.2327E-02	2.3477E-02		
SB-125		1.4613E-01	1.4696E-01	1.1650E-01	1.1680E-01
TE-131	<	3.91E-02	>12 Halflives		
TE-132		3.8980E-02	2.3142E-01	2.6100E-01	2.6132E-01
J-131	<	2.9502E-02	6.0557E-02		
CS-134	<	3.7603E-02	3.7893E-02		
CS-137	#	5.0246E-02	5.0273E-02	4.5669E-02	4.5758E-02
CE-139	<	2.8938E-02	3.0181E-02		
CE-141	<	5.2399E-02	6.2643E-02		
CE-144	<	1.8723E-01	1.9108E-01		
EU-152	C	1.5543E-01	1.5562E-01	1.2317E-01	1.2349E-01
EU-154	<	5.9318E-02	5.9429E-02		
EU-155	A	5.9660E-02	5.9851E-02	1.1658E-01	1.1662E-01
TA-182	#	1.1484E-01	1.2076E-01	1.3543E-01	1.3560E-01
HG-203	<	3.1673E-02	3.5858E-02		
TL-208		2.8545E-01	>12 Halflives	6.8333E-02	7.0211E-02
PB-212		8.5012E-01	>12 Halflives	1.0673E-01	1.1704E-01
PB-214		4.0907E-01	>12 Halflives	1.1711E-01	1.1937E-01
BI-207	<	5.1558E-02	5.1580E-02		

BI-212		4.2436E-01	>12 Halflives	3.2773E-01	3.2860E-01
BI-214		4.1369E-01	>12 Halflives	1.1176E-01	1.1418E-01
RA-224	#	4.6172E-01	2.2409E+00	4.5958E+03	3.4326E+00
AC-228		7.1594E-01	>12 Halflives	1.7371E-01	1.7836E-01
TH-227	<	2.3381E-01	3.1958E-01		
TH-234	A	7.1751E-01	9.1204E-01	1.5990E+00	1.5998E+00
U-235	A	9.7177E-02	9.7177E-02	2.1807E-01	2.1814E-01
NP-237	A	4.3797E-01	4.3797E-01	8.5888E-01	8.5923E-01
AM-241	A	6.8282E-02	6.8285E-02	1.3934E-01	1.3939E-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 2023.1 keV) 1.6904404E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 1.9114162E+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_15DEC2004_1550.An1

Sample description
Detector 101 FSS-OOL-04-01-025-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\101F_15DEC2004_1550.An1

Acquisition information
Start time: 15-Dec-2004 15:42:41
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: YAEC_OperatingSpectrumRevA.Lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: wan32 G53W2.06
Start channel: 100 (50.23keV)
Stop channel: 4048 (2023.09keV)
Peak rejection level: 100.000%
Peak search sensitivity: 3
Sample Size: 1.6630E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6630E+03) =
6.0132E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	best method (based on spectrum).

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

Corrections	Status	Comments
Decay correct to date:	YES	06-Dec-2004 11:47:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

Energy Calibration
Normalized diff: 0.1474

********** 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	
167.96	84.19	227.	47.	0.023	142.97	1.012	TA-182	D
174.07	87.25	237.	82.	0.041	85.90	1.014	PB-214	D
179.20	89.81	217.	71.	0.036	94.79	1.016	PB-214	D
257.26	128.82	172.	81.	0.041	113.61	1.008	AC-228	s
419.38	209.85	97.	57.	0.029	82.84	1.101	NP-239	D
539.89	270.08	64.	53.	0.026	109.32	1.037	AC-228	s
655.78	328.00	44.	32.	0.016	107.07	0.707	AC-228	s
2632.11	1315.64	4.	15.	0.007	108.98	0.525	-	s

s - Peak fails shape tests.
D - Peak area deconvoluted.

This section based on library: YAEC_OperatingSpectrumRevA.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
AM-241	118.64	59.54	101.	28.	0.014	162.92	0.994D
TH-234	126.14	63.29	198.	37.	0.018	169.09	0.997D
TA-182	132.76	66.60	206.	44.	0.022	215.10	1.347s
HG-203	145.31	72.87	262.	0.	0.000	0.00	0.470D
PB-212	149.19	74.81	242.	164.	0.082	46.57	1.005D
BI-207	149.51	74.97	292.	0.	0.000	0.00	0.000D
PB-214	153.79	77.11	252.	276.	0.138	30.39	1.006D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PB-212	153.79	77.11	352.	0.	0.000	208.84	0.485D
CE-144	159.81	80.12	288.	0.	0.000	0.00	0.473D
EU-155	172.48	86.45	327.	0.	0.000	0.00	1.013D
NP-237	172.56	86.49	301.	26.	0.013	293.58	1.013D
CD-109	175.66	88.04	322.	14.	0.007	566.51	1.014D
TH-234	184.34	92.38	310.	27.	0.014	278.85	1.017D
TH-234	185.18	92.80	251.	85.	0.043	85.39	1.018D
NP-237	191.32	95.87	207.	11.	0.006	554.19	1.020D
Cm-243	198.69	99.55	201.	29.	0.014	216.65	1.023D
Cm-243	207.11	103.76	219.	0.	0.000	0.00	1.026D
EU-155	210.21	105.31	199.	30.	0.015	206.75	1.027D
TE-132	222.66	111.53	172.	41.	0.021	219.63	0.773s
TE-132	232.20	116.30	258.	0.	0.000	0.00	1.101D
Cm-243	233.53	116.97	104.	10.	0.005	538.33	0.276s
EU-152	243.04	121.72	136.	0.	0.000	0.00	1.038
CO-57	243.74	122.07	137.	0.	0.000	0.00	1.039D
EU-154	245.57	122.98	82.	25.	0.013	197.54	0.914
CE-144	267.99	134.19	154.	34.	0.017	237.91	2.089s
CO-57	272.48	136.43	92.	0.	0.000	0.00	0.643D
U-235	287.14	143.76	131.	0.	0.000	0.00	0.792D
CE-141	290.52	145.45	174.	12.	0.006	469.10	1.056D
TE-131	299.07	149.72	183.	26.	0.013	232.64	1.059D
U-235	326.34	163.35	130.	15.	0.008	321.66	1.068D
CE-139	331.34	165.85	112.	19.	0.010	240.36	1.070D
SB-125	351.81	176.08	60.	28.	0.014	154.52	0.577s
U-235	371.10	185.72	245.	0.	0.000	0.00	1.084A
RA-226	371.64	185.99	174.	99.	0.050	64.01	1.489A
U-235	410.29	205.31	114.	32.	0.016	153.38	1.098D
TE-132	458.00	229.15	42.	2.	0.001	1596.87	0.000s
TH-227	471.70	236.00	108.	15.	0.007	311.21	1.120D
PB-212	476.96	238.63	89.	508.	0.254	15.47	1.122D
RA-224	481.70	241.00	117.	49.	0.025	102.19	1.690A
PB-214	483.54	241.92	122.	57.	0.029	12.06	1.124A
SN-113	509.79	255.04	60.	0.	0.000	0.00	0.739D
TH-227	511.58	255.93	60.	52.	0.026	117.10	0.739s
Cm-243	554.93	277.60	73.	29.	0.015	136.33	1.149D
HG-203	558.07	279.17	79.	0.	0.000	0.00	1.150D
J-131	568.00	284.13	21.	0.	0.000	0.00	0.000s
PB-214	590.65	295.45	90.	123.	0.062	47.34	1.212s
CR-51	638.24	319.24	49.	13.	0.006	267.72	0.642s
AC-228	676.59	338.40	72.	97.	0.049	52.35	1.132
EU-152	687.00	343.61	17.	2.	0.001	786.61	0.187s
PB-214	703.91	352.06	62.	202.	0.101	28.93	1.026s
J-131	728.44	364.32	22.	1.	0.001	1841.20	0.390s
SN-113	783.00	391.58	14.	0.	0.000	0.00	0.000s
SB-125	856.32	428.23	24.	19.	0.009	140.34	0.937s
Ag-108M	862.88	431.51	28.	8.	0.004	321.13	0.938
TE-131	906.60	453.36	32.	8.	0.004	371.48	0.716s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-125	925.53	462.82	25.	39.	0.019	76.72	1.549s
TE-131	985.00	492.54	10.	0.	0.000	0.00	0.000s
TL-208	1021.13	510.59	54.	63.	0.032	73.72	1.672s
Kr-85	1027.71	513.88	45.	0.	0.000	0.00	1.313
CS-134	1138.58	569.29	21.	0.	0.000	0.00	0.787D
BI-207	1137.00	568.50	19.	4.	0.002	486.06	0.905
TL-208	1166.58	583.29	38.	136.	0.068	34.44	1.097
SB-125	1201.57	600.77	16.	3.	0.001	645.90	1.372D
CS-134	1209.35	604.66	23.	7.	0.003	331.27	1.374D
BI-214	1218.68	609.32	21.	147.	0.073	28.15	1.378D
Ag-108M	1228.78	614.37	23.	0.	0.000	0.00	1.381D
SB-125	1274.77	637.36	12.	9.	0.005	204.42	0.694s
J-131	1274.18	637.06	13.	0.	0.000	0.00	1.396
AG-110M	1315.58	657.75	12.	1.	0.000	1548.62	1.410D
CS-137	1323.33	661.62	20.	134.	0.067	29.58	1.413D
NB-94	1401.70	700.79	20.	6.	0.003	343.06	0.598s
Ag-108M	1446.05	722.95	23.	0.	0.000	0.00	1.454D
EU-154	1446.75	723.30	21.	7.	0.004	288.95	1.454D
BI-212	1454.49	727.17	24.	24.	0.012	104.69	1.457D
EU-152	1557.00	778.40	9.	2.	0.001	706.46	0.458s
BI-212	1568.44	784.11	22.	10.	0.005	239.60	1.055
CS-134	1591.75	795.76	16.	19.	0.009	116.24	1.502D
CS-134	1603.91	801.84	14.	6.	0.003	295.72	1.506D
CO-58	1621.58	810.67	2.	1.	0.001	670.82	0.673s
MN-54	1670.67	835.20	15.	2.	0.001	963.85	0.362s
MN-56	1693.83	846.77	13.	18.	0.009	138.53	0.912s
NB-94	1740.93	870.31	6.	5.	0.002	247.39	0.627s
AG-110M	1770.00	884.84	2.	0.	0.000	0.00	0.000s
Y-88	1795.67	897.67	10.	8.	0.004	186.05	1.184
AC-228	1823.06	911.35	28.	62.	0.031	61.27	1.015s
AG-110M	1874.50	937.06	2.	0.	0.000	0.00	0.583s
EU-152	1928.41	964.00	16.	0.	0.000	0.00	1.586D
AC-228	1938.23	968.91	22.	45.	0.023	70.24	1.839
EU-154	2009.33	1004.44	2.	1.	0.001	624.50	0.394s
BI-207	2129.43	1064.45	7.	3.	0.002	412.31	0.951s
FE-59	2200.69	1100.06	5.	8.	0.004	173.21	1.260
EU-152	2224.72	1112.07	3.	0.	0.000	0.00	0.250D
ZN-65	2231.62	1115.52	18.	2.	0.001	783.45	1.710D
BI-214	2241.15	1120.28	18.	28.	0.014	86.59	1.713D
TA-182	2243.15	1121.28	25.	0.	0.000	0.00	0.623D
TE-131	2294.00	1146.69	3.	1.	0.000	748.33	0.000s
CO-60	2347.00	1173.17	11.	0.	0.000	0.00	0.000s
TA-182	2380.60	1189.96	9.	10.	0.005	171.03	1.124s
TA-182	2444.96	1222.12	26.	15.	0.008	196.52	0.596s
EU-154	2551.25	1275.24	3.	1.	0.000	781.03	0.500s
FE-59	2581.30	1290.25	6.	10.	0.005	173.21	1.240s
CO-60	2665.19	1332.17	6.	10.	0.005	75.00	0.833s
AG-110M	2768.57	1383.83	2.	2.	0.001	466.69	0.656s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-152	2817.00	1408.03	4.	6.	0.003	193.70	0.666s
K-40	2921.95	1460.47	5.	437.	0.218	14.67	2.137
BI-212	3239.33	1619.05	2.	5.	0.003	175.89	0.435s
BI-214	3528.74	1763.65	0.	30.	0.015	54.77	1.774
MN-56	3621.50	1810.00	0.	5.	0.002	134.16	0.999s
Y-88	3673.00	1835.73	0.	1.	0.000	300.00	0.500s

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 microCi	Peak Energy keV	Peak Activity microCi	Peak Code	Peak MDA Value microCi	Comments
K-40		1.8742E-02	1460.75	1.874E-02	(	5.782E-04	G
CR-51		1.4544E-04	320.07	1.454E-04	&(	4.069E-04	G
MN-54		0.0000E+00	834.81	0.000E+00	%	5.867E-05	G
MN-56		6.1969E-05	846.60	5.082E-05	?(	5.674E-05	G
			1811.20	1.026E-04	&(	1.512E-04	G
FE-59		6.8018E-05	1099.22	5.072E-05	(	8.324E-05	G
			1291.56	9.064E-05	&(	1.392E-04	G
CO-57		0.0000E+00	122.07	0.000E+00	} P	4.278E-05	G
			136.43	0.000E+00	%	2.886E-04	G
CO-58		0.0000E+00	810.75	0.000E+00	%	2.562E-05	G
CO-60		4.0362E-05	1332.51	4.036E-05	(P	6.171E-05	G
			1173.23	0.000E+00	? P	6.870E-05	G
Cm-243		1.6906E-04	277.60	2.060E-04	(	3.008E-04	G
			117.00	0.000E+00	}	2.974E-04	G
			103.76	0.000E+00	!	2.035E-04	G
			99.55	1.329E-04	(	3.182E-04	G
ZN-65		0.0000E+00	1115.52	0.000E+00	%	1.593E-04	G
Kr-85		0.0000E+00	513.99	0.000E+00		1.415E+00	G
Y-88		0.0000E+00	1836.01	0.000E+00	% P	4.191E-05	G
			898.02	2.511E-05	? P	5.600E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	1.4604E-05	871.10	1.460E-05	&(	4.126E-05		G
		702.50	0.000E+00	&	5.602E-05		G
Ag-108M	0.0000E+00	722.95	0.000E+00	}	6.838E-05		G
		614.37	0.000E+00	%	5.916E-05		G
		433.93	0.000E+00	&	4.624E-05		G
AG-110M	0.0000E+00	657.75	0.000E+00	%	4.509E-05		G
		884.67	0.000E+00	?	3.780E-05		G
		937.48	0.000E+00	?	8.448E-05		G
		1384.27	0.000E+00	%	1.768E-04		G
CD-109	0.0000E+00	88.04	0.000E+00	%	1.594E-03		G
SN-113	0.0000E+00	391.71	0.000E+00	? P	4.338E-05		G
		255.04	0.000E+00	&	1.720E-03		G
SB-125	2.4155E-04	427.95	9.616E-05	(	1.293E-04		G
		600.77	0.000E+00	%	2.429E-04		G
		636.15	1.829E-04	}	3.649E-04		G
		463.51	6.264E-04	&(	4.239E-04		G
		176.29	3.138E-04	?(	4.349E-04		G
TE-131	2.4458E-05	149.72	2.446E-05	(	6.302E-05		G
		452.32	0.000E+00	&	2.506E-04		G
		1146.96	0.000E+00	%	8.405E-04		G
		492.66	0.000E+00	?	6.201E-04		G
TE-132	0.0000E+00	228.16	0.000E+00	&	3.096E-05		G
		116.30	0.000E+00	}	2.548E-03		G
		111.76	1.424E-03	*	2.217E-03		G
J-131	0.0000E+00	364.48	0.000E+00	%	3.870E-05		G
		636.97	0.000E+00	}	5.898E-04		G
		284.29	0.000E+00	?	4.013E-04		G
CS-134	0.0000E+00	604.66	0.000E+00	%	5.411E-05		G
		795.76	5.842E-05		6.823E-05		G
		569.29	0.000E+00	}	3.082E-04		G
		801.84	1.840E-04		6.275E-04		G
CS-137	3.6073E-04	661.62	3.607E-04	(	6.390E-05		G
CE-139	1.6536E-05	165.85	1.654E-05	(P	4.452E-05		G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-141	0.0000E+00	145.45	0.000E+00	%		8.744E-05	G
CE-144	2.0244E-04	133.53	2.024E-04	&(		3.605E-04	G
		80.12	0.000E+00	&		3.851E-03	G
EU-152	0.0000E+00	121.78	0.000E+00	}		1.246E-04	G
		344.30	0.000E+00	&		9.831E-05	G
		1408.08	1.328E-04	?		2.439E-04	G
		964.00	0.000E+00	&		4.740E-04	G
		1112.07	0.000E+00	?		2.873E-04	G
		778.90	0.000E+00	%		3.421E-04	G
EU-154	3.9483E-05	123.10	3.948E-05	?(		7.092E-05	G
		1274.80	0.000E+00	%		1.288E-04	G
		723.30	9.048E-05	}		2.988E-04	G
		1004.80	0.000E+00	%		1.750E-04	G
EU-155	8.9462E-05	86.45	0.000E+00	}		1.880E-04	G
		105.31	8.946E-05	$(		2.040E-04	G
TA-182	1.6599E-04	67.75	1.036E-04	&(		1.659E-04	G
		1121.28	0.000E+00	&		2.708E-04	G
		1221.42	2.197E-04	*(		3.771E-04	G
		1189.05	2.332E-04	&(		3.891E-04	G
HG-203	0.0000E+00	279.17	0.000E+00	%	P	5.376E-05	G
		72.87	0.000E+00	&		1.039E-03	G
TL-208	3.2087E-04	583.14	3.209E-04	(		7.434E-05	G
		510.72	5.011E-04	+		2.916E-04	G
PB-212	1.0228E-03	238.63	1.023E-03	(		9.396E-05	G
		77.11	0.000E+00	}		4.049E-04	Energy duplication
		74.81	1.396E-03	}		6.403E-04	G
PB-214	6.7190E-04	351.99	6.724E-04	@(		1.317E-04	G
		295.22	6.710E-04	*(		2.554E-04	G
		77.11	2.024E-03	}		5.632E-04	Energy duplication
		241.92	6.719E-04	}		6.362E-04	G
BI-207	0.0000E+00	569.67	0.000E+00	}		4.645E-05	G
		1063.62	0.000E+00	%		6.798E-05	G
		74.97	0.000E+00	}		1.738E-04	G
BI-212	6.9271E-04	727.17	5.106E-04	(		5.346E-04	G
		1620.56	9.773E-04	&(		1.599E-03	G
		785.42	1.376E-03	&(		3.248E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-214	6.6978E-04	609.32	6.706E-04	(	1.109E-04		G
		1764.51	1.026E-03	+	2.521E-04		G
		1120.28	6.673E-04	(	5.424E-04		G
RA-224	1.1085E-03	241.00	1.109E-03	}(	1.881E-03		G
RA-226	2.1973E-03	185.99	2.197E-03	}(	1.423E-03		G
AC-228	7.6478E-04	911.07	6.445E-04	(	2.845E-04		G
		968.90	8.269E-04	(	4.514E-04		G
		338.40	9.649E-04	(	4.180E-04		G
TH-227	0.0000E+00	236.00	0.000E+00	%	3.932E-04		G
		256.25	7.044E-04	*	5.257E-04		G
TH-234	1.1430E-03	63.29	1.143E-03	(	2.114E-03		G
		92.80	1.927E-03	}	1.733E-03		G
		92.38	7.247E-04	}	2.244E-03		G
U-235	0.0000E+00	185.72	0.000E+00	}	1.018E-04		G
		143.76	0.000E+00	&	3.480E-04		G
		205.31	5.202E-04	$	8.661E-04		G
		163.35	0.000E+00	%	8.077E-04		G
NP-237	0.0000E+00	86.49	1.383E-04	}	4.515E-04		G
		95.87	0.000E+00	%	1.579E-03		G
AM-241	1.2051E-04	59.54	1.205E-04	(P	2.161E-04		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
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

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
K-40		1.1270E+01	1.1270E+01	1.6538E+00	1.7722E+00
CR-51	A	8.7454E-02	1.0999E-01	2.9448E-01	2.9454E-01
MN-54	<	3.5280E-02	3.6005E-02		
MN-56	#	3.7264E-02	>12 Halflives	3.5932E-02	3.5993E-02
FE-59	A	4.0901E-02	4.7086E-02	5.7669E-02	5.7730E-02
CO-57	<	1.7351E-01	1.7764E-01		
CO-58	<	1.5406E-02	1.6852E-02		
CO-60	A	2.4271E-02	2.4351E-02	3.0673E-02	3.0704E-02
Cm-243	A	1.0166E-01	1.0171E-01	1.3018E-01	1.3031E-01
ZN-65	<	9.5813E-02	9.8342E-02		
Kr-85	<	8.5098E+02	8.5104E+02		
Y-88	<	2.5204E-02	2.6751E-02		
NB-94	#A	8.7817E-03	8.7817E-03	2.1725E-02	2.1731E-02
Ag-108M	<	3.5573E-02	3.5578E-02		
AG-110M	<	2.7116E-02	2.7814E-02		
CD-109	<	9.5847E-01	9.7200E-01		
SN-113	<	2.6087E-02	2.7567E-02		
SB-125		1.4525E-01	1.4616E-01	1.0835E-01	1.0867E-01
TE-131	A	1.4707E-02	>12 Halflives	3.4214E-02	3.4224E-02
TE-132	<	1.8617E-02	1.3174E-01		
J-131	<	2.3271E-02	5.1277E-02		
CS-134	<	3.2539E-02	3.2815E-02		
CS-137		2.1691E-01	2.1704E-01	6.4208E-02	6.5369E-02
CE-139	A	9.9434E-03	1.0414E-02	2.5212E-02	2.5219E-02
CE-141	<	5.2582E-02	6.3978E-02		
CE-144	#A	1.2173E-01	1.2448E-01	2.9616E-01	2.9624E-01
EU-152	<	5.9116E-02	5.9197E-02		
EU-154	A	2.3742E-02	2.3791E-02	4.6997E-02	4.7016E-02
EU-155	A	5.3796E-02	5.3985E-02	1.1161E-01	1.1165E-01
TA-182		9.9814E-02	1.0548E-01	1.1879E-01	1.1893E-01
HG-203	<	3.2325E-02	3.7047E-02		
TL-208		1.9295E-01	>12 Halflives	6.6456E-02	6.7344E-02
PB-212		6.1505E-01	>12 Halflives	9.5124E-02	1.0127E-01
PB-214		4.0403E-01	>12 Halflives	1.1208E-01	1.1438E-01
BI-207	<	4.0880E-02	4.0899E-02		

BI-212		4.1654E-01	>12 Halflives	4.3608E-01	4.3671E-01
BI-214		4.0276E-01	>12 Halflives	1.1338E-01	1.1564E-01
RA-224	#	6.6658E-01	3.7805E+00	4.9643E+03	3.8691E+00
RA-226	#	1.3213E+00	1.3213E+00	1.0552E+03	8.4900E-01
AC-228		4.5988E-01	>12 Halflives	1.6387E-01	1.6592E-01
TH-227	<	2.3644E-01	3.3330E-01		
TH-234	A	6.8729E-01	8.9454E-01	1.5125E+00	1.5134E+00
U-235	<	2.0924E-01	2.0924E-01		
NP-237	<	9.4931E-01	9.4931E-01		
AM-241	A	7.2466E-02	7.2469E-02	1.1917E-01	1.1924E-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 2023.1 keV) 1.4952061E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 1.8312319E+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_15DEC2004_1630.An1

Sample description
Detector 101 FSS-OOL-04-01-016-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\101F_15DEC2004_1630.An1

Acquisition information
Start time: 15-Dec-2004 16:21:40
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: YAEC_OperatingSpectrumRevA.Lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: wan32 G53W2.06
Start channel: 100 (50.23keV)
Stop channel: 4048 (2023.09keV)
Peak rejection level: 100.000%
Peak search sensitivity: 3
Sample Size: 1.7740E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7740E+03) =
5.6370E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	best method (based on spectrum).

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

Corrections	Status	Comments
Decay correct to date:	YES	03-Dec-2004 12:11:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

Energy Calibration
Normalized diff: 0.1447

********** 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	87.36	243.	100.	0.050	72.51	1.014	PB-214	D
179.58	90.00	253.	82.	0.041	88.95	1.016	PB-214	D
185.78	93.10	308.	74.	0.037	106.08	1.018	U-235	D
257.75	129.14	146.	78.	0.039	74.35	1.044	AC-228	D
342.53	171.44	130.	88.	0.044	96.25	0.738	-	s
418.35	209.75	150.	58.	0.029	97.47	1.101	NP-239	D
539.46	269.87	86.	72.	0.036	96.40	1.636	AC-228	s
599.41	299.78	84.	40.	0.020	107.63	1.165	TH-227	D

s - Peak fails shape tests.
D - Peak area deconvoluted.

This section based on library: YAEC_OperatingSpectrumRevA.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
AM-241	118.64	59.54	204.	34.	0.017	182.56	0.994D
TH-234	126.14	63.29	191.	43.	0.022	143.43	0.996D
TA-182	135.53	67.98	170.	17.	0.009	436.56	1.027
HG-203	145.31	72.87	225.	19.	0.009	350.12	1.003D
PB-212	149.19	74.81	279.	211.	0.106	39.36	1.005D
BI-207	149.51	74.97	490.	0.	0.000	20805.06	1.005D
PB-214	153.79	77.11	274.	316.	0.158	27.94	1.006D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PB-212	153.79	77.11	402.	0.	0.000	373.16	0.447D
CE-144	159.81	80.12	148.	0.	0.000	0.00	1.428D
EU-155	172.48	86.45	256.	0.	0.000	0.00	1.013D
NP-237	172.56	86.49	229.	27.	0.014	244.24	1.013D
CD-109	175.66	88.04	368.	9.	0.005	886.82	1.014D
TH-234	184.34	92.38	335.	55.	0.028	146.48	1.017D
TH-234	185.18	92.80	382.	0.	0.000	0.00	1.018D
NP-237	191.32	95.87	257.	7.	0.004	941.58	1.020D
Cm-243	198.69	99.55	234.	18.	0.009	360.48	1.023D
Cm-243	207.11	103.76	223.	14.	0.007	455.57	1.026D
EU-155	210.21	105.31	230.	22.	0.011	300.52	1.027D
TE-132	224.50	112.45	245.	64.	0.032	183.59	0.808s
TE-132	232.20	116.30	217.	18.	0.009	353.28	1.035D
Cm-243	233.60	117.00	237.	6.	0.003	1116.30	1.035D
EU-152	241.67	121.03	112.	19.	0.009	297.50	0.514s
CO-57	243.88	122.14	225.	0.	0.000	0.00	1.039
EU-154	245.80	123.10	230.	0.	0.000	0.00	1.039D
CE-144	266.67	133.53	194.	38.	0.019	164.32	1.047D
CO-57	272.48	136.43	105.	0.	0.000	0.00	0.812D
U-235	287.14	143.76	135.	9.	0.005	546.44	1.054D
CE-141	290.52	145.45	180.	11.	0.005	548.42	1.055D
TE-131	299.07	149.72	203.	32.	0.016	195.92	1.058D
U-235	326.34	163.35	164.	60.	0.030	97.88	1.068D
CE-139	331.34	165.85	163.	22.	0.011	250.10	1.070D
SB-125	353.61	176.98	165.	93.	0.047	106.16	2.713s
U-235	371.10	185.72	257.	0.	0.000	0.00	1.084A
RA-226	371.64	185.99	160.	123.	0.061	51.45	1.135A
U-235	410.29	205.31	124.	14.	0.007	351.20	1.098D
TE-132	455.91	228.11	124.	22.	0.011	345.51	0.992s
TH-227	471.70	236.00	126.	18.	0.009	273.45	1.120D
PB-212	476.96	238.63	104.	574.	0.287	14.63	1.122D
RA-224	481.70	241.00	94.	33.	0.017	134.59	1.411A
PB-214	483.54	241.92	118.	58.	0.029	11.07	1.124A
SN-113	510.24	255.27	60.	0.	0.000	0.00	1.133
TH-227	512.81	256.55	45.	26.	0.013	165.61	1.506s
Cm-243	554.93	277.60	79.	32.	0.016	128.93	1.149D
HG-203	558.07	279.17	89.	0.	0.000	0.00	1.150D
J-131	567.50	283.88	29.	0.	0.000	0.00	0.583s
PB-214	590.19	295.22	82.	124.	0.062	40.90	1.161D
CR-51	641.00	320.62	25.	0.	0.000	1931.32	0.000s
AC-228	676.33	338.27	100.	127.	0.064	49.59	1.102
EU-152	690.15	345.18	36.	27.	0.014	166.67	0.696s
PB-214	703.75	351.98	82.	202.	0.101	30.39	1.072
J-131	728.67	364.43	39.	8.	0.004	347.76	1.666s
SN-113	784.43	392.30	37.	48.	0.024	106.22	1.785s
SB-125	856.11	428.12	17.	7.	0.004	274.42	0.388s
Ag-108M	865.62	432.87	44.	13.	0.007	270.76	0.455s
TE-131	905.00	452.56	22.	2.	0.001	793.73	0.000s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-125	926.15	463.13	45.	27.	0.014	131.23	1.882s
TE-131	984.00	492.04	30.	11.	0.005	252.92	0.519s
TL-208	1021.38	510.72	44.	75.	0.037	51.47	1.311D
Kr-85	1027.92	513.99	51.	6.	0.003	516.31	1.313D
CS-134	1138.58	569.29	38.	0.	0.000	0.00	0.000D
BI-207	1139.60	569.80	37.	16.	0.008	201.39	0.687s
TL-208	1166.33	583.16	40.	153.	0.076	32.40	1.396
SB-125	1201.57	600.77	19.	2.	0.001	851.29	1.372D
CS-134	1209.35	604.66	29.	3.	0.001	830.32	1.374D
BI-214	1218.68	609.32	23.	162.	0.081	26.69	1.378D
Ag-108M	1228.78	614.37	8.	0.	0.000	0.00	0.250D
SB-125	1271.62	635.78	8.	2.	0.001	587.37	0.750s
J-131	1273.34	636.64	11.	0.	0.000	0.00	1.396
AG-110M	1315.58	657.75	24.	8.	0.004	274.82	1.410D
CS-137	1323.33	661.62	22.	139.	0.070	29.24	1.413D
NB-94	1403.08	701.48	28.	16.	0.008	187.50	0.622s
Ag-108M	1446.05	722.95	25.	7.	0.004	302.24	1.454D
EU-154	1446.75	723.30	10.	0.	0.000	0.00	0.346D
BI-212	1454.49	727.17	15.	37.	0.018	67.32	1.457D
EU-152	1558.00	778.90	4.	0.	0.000	0.00	0.000s
BI-212	1572.84	786.31	26.	8.	0.004	324.11	0.478s
CS-134	1591.75	795.76	32.	25.	0.013	112.24	1.502D
CS-134	1603.91	801.84	20.	1.	0.001	1503.93	1.506D
CO-58	1621.92	810.84	5.	1.	0.000	927.36	0.482s
MN-54	1671.00	835.37	5.	0.	0.000	0.00	0.000s
MN-56	1692.82	846.27	20.	8.	0.004	267.05	0.696s
NB-94	1742.67	871.18	3.	2.	0.001	483.74	0.401s
AG-110M	1768.95	884.32	6.	3.	0.002	352.71	0.479s
Y-88	1796.00	897.83	8.	4.	0.002	269.44	0.500s
AC-228	1822.45	911.05	28.	120.	0.060	38.51	1.793
AG-110M	1876.44	938.03	6.	1.	0.001	994.99	0.450s
EU-152	1928.41	964.00	22.	0.	0.000	0.00	0.666D
AC-228	1939.25	969.42	22.	33.	0.017	90.87	1.745s
EU-154	2010.00	1004.77	4.	0.	0.000	0.00	0.000s
BI-207	2127.66	1063.57	11.	23.	0.012	98.17	1.283
FE-59	2199.42	1099.43	15.	7.	0.004	286.04	1.295
EU-152	2224.72	1112.07	5.	0.	0.000	0.00	0.583D
ZN-65	2231.59	1115.50	25.	0.	0.000	0.00	1.710
BI-214	2240.66	1120.03	28.	48.	0.024	79.99	1.709
TA-182	2243.12	1121.26	57.	0.	0.000	0.00	1.713
TE-131	2297.00	1148.19	5.	2.	0.001	408.83	0.000s
CO-60	2348.33	1173.84	19.	0.	0.000	0.00	0.750s
TA-182	2376.89	1188.11	8.	6.	0.003	234.52	0.588s
TA-182	2444.00	1221.64	6.	1.	0.001	994.99	0.000s
EU-154	2549.00	1274.11	4.	1.	0.001	793.73	0.167s
FE-59	2585.00	1292.10	9.	5.	0.002	314.64	0.500s
CO-60	2667.13	1333.14	14.	3.	0.001	206.38	0.650s
AG-110M	2767.67	1383.38	1.	0.	0.000	390.51	0.419s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-152	2815.25	1407.15	0.	12.	0.006	86.60	0.625s
K-40	2921.99	1460.49	11.	443.	0.221	15.06	2.236
BI-212	3237.50	1618.14	0.	12.	0.006	86.60	0.500s
BI-214	3530.08	1764.32	0.	25.	0.013	60.00	1.624
MN-56	3622.00	1810.25	0.	0.	0.000	0.00	0.000s
Y-88	3674.00	1836.23	1.	0.	0.000	335.41	0.000s

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 microCi	Peak Energy keV	Peak Activity microCi	Code	MDA Value microCi	Comments
K-40		1.9014E-02	1460.75	1.901E-02	(	7.797E-04	G
CR-51		0.0000E+00	320.07	0.000E+00	%	2.969E-04	G
MN-54		0.0000E+00	834.81	0.000E+00	?	3.693E-05	G
MN-56		2.4449E-05	846.60	2.445E-05	?(	6.699E-05	G
			1811.20	0.000E+00	?	1.512E-04	G
FE-59		4.6492E-05	1099.22	4.649E-05	?(	1.303E-04	G
			1291.56	0.000E+00	%	1.592E-04	G
CO-57		0.0000E+00	122.07	0.000E+00	} P	5.423E-05	G
			136.43	0.000E+00	!	3.071E-04	G
CO-58		0.0000E+00	810.75	0.000E+00	%	3.711E-05	G
CO-60		0.0000E+00	1332.51	0.000E+00	% P	8.659E-05	G
			1173.23	0.000E+00	% P	8.720E-05	G
Cm-243		2.2699E-04	277.60	2.270E-04	(	3.122E-04	G
			117.00	0.000E+00	}	4.409E-04	G
			103.76	0.000E+00	%	2.052E-04	G
			99.55	0.000E+00	%	3.417E-04	G
ZN-65		0.0000E+00	1115.52	0.000E+00		1.859E-04	G
Kr-85		0.0000E+00	513.99	0.000E+00	%	1.499E+00	G
Y-88		0.0000E+00	1836.01	0.000E+00	% P	4.191E-05	G
			898.02	0.000E+00	% P	5.020E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
NB-94	0.0000E+00	871.10	0.000E+00	%	3.277E-05	G
		702.50	3.849E-05	&	6.584E-05	G
Ag-108M	0.0000E+00	722.95	0.000E+00	}	7.039E-05	G
		614.37	0.000E+00	&	3.733E-05	G
		433.93	2.197E-05	&	5.681E-05	G
AG-110M	1.9490E-05	657.75	1.949E-05	(	6.084E-05	G
		884.67	0.000E+00	%	5.676E-05	G
		937.48	0.000E+00	%	1.283E-04	G
		1384.27	0.000E+00	%	1.326E-04	G
CD-109	0.0000E+00	88.04	0.000E+00	%	1.699E-03	G
SN-113	1.0230E-04	391.71	1.023E-04	*(P	6.663E-05	G
		255.04	0.000E+00	%	1.720E-03	G
SB-125	2.6118E-04	427.95	3.543E-05	?(	1.110E-04	G
		600.77	0.000E+00	%	2.622E-04	G
		636.15	0.000E+00	}	3.113E-04	G
		463.51	4.374E-04	(	5.503E-04	G
		176.29	1.042E-03	&(	7.012E-04	G
TE-131	5.4314E-05	149.72	3.068E-05	(	6.615E-05	G
		452.32	0.000E+00	%	2.154E-04	G
		1146.96	0.000E+00	&	9.573E-04	G
		492.66	3.910E-04	?(	1.004E-03	G
TE-132	0.0000E+00	228.16	0.000E+00	%	5.165E-05	G
		116.30	0.000E+00	}	2.342E-03	G
		111.76	2.223E-03	&	2.628E-03	G
J-131	0.0000E+00	364.48	0.000E+00	%	5.011E-05	G
		636.97	0.000E+00	}	5.491E-04	G
		284.29	0.000E+00	?	4.637E-04	G
CS-134	0.0000E+00	604.66	0.000E+00	%	5.976E-05	G
		795.76	7.946E-05		9.146E-05	G
		569.29	0.000E+00	}	4.001E-04	G
		801.84	0.000E+00	%	7.273E-04	G
CS-137	3.7413E-04	661.62	3.741E-04	(	6.652E-05	G
CE-139	1.9044E-05	165.85	1.904E-05	(P	5.326E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-141	0.0000E+00	145.45	0.000E+00	%		8.902E-05	G
CE-144	2.2444E-04	133.53	2.244E-04	(		4.029E-04	G
		80.12	0.000E+00	!		2.793E-03	G
EU-152	1.7847E-04	121.78	4.152E-05	}		1.137E-04	G
		344.30	1.211E-04	&(		1.375E-04	G
		1408.08	2.515E-04	?(		1.545E-04	G
		964.00	0.000E+00	&		5.382E-04	G
		1112.07	0.000E+00	?		3.499E-04	G
		778.90	0.000E+00	?		2.447E-04	G
EU-154	0.0000E+00	123.10	0.000E+00	%		1.159E-04	G
		1274.80	0.000E+00	%		1.381E-04	G
		723.30	0.000E+00	}		2.141E-04	G
		1004.80	0.000E+00	?		2.264E-04	G
EU-155	0.0000E+00	86.45	0.000E+00	}		1.670E-04	G
		105.31	0.000E+00	%		2.187E-04	G
TA-182	0.0000E+00	67.75	0.000E+00	%		1.512E-04	G
		1121.28	0.000E+00	%		3.946E-04	G
		1221.42	0.000E+00	%		2.024E-04	G
		1189.05	1.399E-04	&		3.705E-04	G
HG-203	0.0000E+00	279.17	0.000E+00	%	P	5.679E-05	G
		72.87	0.000E+00	%		9.654E-04	G
TL-208	3.5966E-04	583.14	3.597E-04	(		7.565E-05	G
		510.72	5.897E-04	+		2.673E-04	G
PB-212	1.1546E-03	238.63	1.155E-03	(		1.014E-04	G
		77.11	0.000E+00	}		4.318E-04	Energy duplication
		74.81	1.798E-03	}		6.852E-04	G
PB-214	6.7579E-04	351.99	6.746E-04	(		1.494E-04	G
		295.22	6.781E-04	(		2.443E-04	G
		77.11	2.317E-03	}		5.865E-04	Energy duplication
		241.92	6.758E-04	}		6.254E-04	G
BI-207	1.0472E-04	569.67	3.295E-05	}		6.240E-05	G
		1063.62	1.047E-04	(		8.158E-05	G
		74.97	0.000E+00	}		2.233E-04	G
BI-212	7.6980E-04	727.17	7.698E-04	(		4.420E-04	G
		1620.56	2.199E-03	&		1.350E-03	G
		785.42	0.000E+00	&		3.504E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
BI-214	7.6986E-04	609.32	7.404E-04	(	1.141E-04	G
		1764.51	8.552E-04	(	2.521E-04	G
		1120.28	1.174E-03	+	6.680E-04	G
RA-224	7.4527E-04	241.00	7.453E-04	}(	1.998E-03	G
RA-226	2.7165E-03	185.99	2.716E-03	}(	1.365E-03	G
AC-228	1.2627E-03	911.07	1.263E-03	(	2.891E-04	G
		968.90	6.125E-04	-	4.484E-04	G
		338.40	1.262E-03	(	4.881E-04	G
TH-227	2.1917E-04	236.00	1.384E-04	(	4.224E-04	G
		256.25	3.522E-04	(	4.602E-04	G
TH-234	1.3346E-03	63.29	1.335E-03	(	2.077E-03	G
		92.80	0.000E+00	}	2.124E-03	G
		92.38	1.461E-03	}	2.331E-03	G
U-235	0.0000E+00	185.72	0.000E+00	}	1.042E-04	G
		143.76	0.000E+00	%	3.530E-04	G
		205.31	0.000E+00	%	9.004E-04	G
		163.35	8.743E-04		9.030E-04	G
NP-237	0.0000E+00	86.49	1.461E-04	}	3.954E-04	G
		95.87	0.000E+00	%	1.750E-03	G
AM-241	1.4929E-04	59.54	1.493E-04	(P	3.016E-04	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
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

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
K-40		1.0718E+01	1.0718E+01	1.6138E+00	1.7237E+00
CR-51	<	1.6733E-01	2.2693E-01		
MN-54	<	2.0819E-02	2.1389E-02		
MN-56	#A	1.3782E-02	>12 Halflives	3.6805E-02	3.6813E-02
FE-59	#A	2.6207E-02	3.1600E-02	9.0387E-02	9.0405E-02
CO-57	<	1.7313E-01	1.7863E-01		
CO-58	<	2.0919E-02	2.3568E-02		
CO-60	<	4.8812E-02	4.9026E-02		
Cm-243	A	1.2795E-01	1.2805E-01	1.6509E-01	1.6525E-01
ZN-65	<	1.0482E-01	1.0851E-01		
Kr-85	<	8.4485E+02	8.4493E+02		
Y-88	<	2.3627E-02	2.5573E-02		
NB-94	<	1.8470E-02	1.8470E-02		
Ag-108M	<	2.1045E-02	2.1049E-02		
AG-110M	A	1.0987E-02	1.1364E-02	3.1231E-02	3.1237E-02
CD-109	<	9.5770E-01	9.7570E-01		
SN-113	#	5.7667E-02	6.2053E-02	6.7568E-02	6.7659E-02
SB-125	C	1.4723E-01	1.4846E-01	1.5760E-01	1.5783E-01
TE-131	A	3.0617E-02	>12 Halflives	4.8975E-02	4.9005E-02
TE-132	<	2.9114E-02	3.9184E-01		
J-131	<	2.8248E-02	8.0687E-02		
CS-134	<	3.3688E-02	3.4068E-02		
CS-137		2.1090E-01	2.1106E-01	6.1706E-02	6.2848E-02
CE-139	A	1.0735E-02	1.1414E-02	2.8727E-02	2.8734E-02
CE-141	<	5.0178E-02	6.5117E-02		
CE-144	A	1.2652E-01	1.3033E-01	2.1416E-01	2.1428E-01
EU-152	C	1.0061E-01	1.0079E-01	8.7286E-02	8.7471E-02
EU-154	<	6.5329E-02	6.5507E-02		
EU-155	<	1.2330E-01	1.2387E-01		
TA-182	<	8.5210E-02	9.1698E-02		
HG-203	<	3.2011E-02	3.8367E-02		
TL-208		2.0274E-01	>12 Halflives	6.5683E-02	6.6674E-02
PB-212		6.5082E-01	>12 Halflives	9.5232E-02	1.0209E-01
PB-214		3.8094E-01	>12 Halflives	9.7060E-02	9.9418E-02
BI-207		5.9032E-02	5.9068E-02	5.7988E-02	5.8084E-02

BI-212		4.3394E-01	>12 Halflives	2.9214E-01	2.9317E-01
BI-214		4.3397E-01	>12 Halflives	1.1582E-01	1.1839E-01
RA-224	#	4.2011E-01	4.2137E+00	7.3964E+03	5.6761E+00
RA-226	#	1.5313E+00	1.5313E+00	9.4704E+02	7.9257E-01
AC-228		7.1177E-01	>12 Halflives	2.2343E-01	2.2702E-01
TH-227	A	1.2354E-01	1.9495E-01	3.1161E-01	3.1180E-01
TH-234	A	7.5233E-01	1.0678E+00	1.5314E+00	1.5326E+00
U-235	<	1.9897E-01	1.9897E-01		
NP-237	<	9.8648E-01	9.8648E-01		
AM-241	A	8.4157E-02	8.4161E-02	1.5480E-01	1.5488E-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 2023.1 keV) 1.4507486E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 1.8704273E+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_15DEC2004_1705.An1

Sample description
Detector 101 FSS-OOL-04-01-006-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\101F_15DEC2004_1705.An1

Acquisition information
Start time: 15-Dec-2004 16:57:50
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: YAEC_OperatingSpectrumRevA.Lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: wan32 G53W2.06
Start channel: 100 (50.23keV)
Stop channel: 4048 (2023.09keV)
Peak rejection level: 100.000%
Peak search sensitivity: 3
Sample Size: 2.1090E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.1090E+03) =
4.7416E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	best method (based on spectrum).

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

Corrections	Status	Comments
Decay correct to date:	YES	03-Dec-2004 07:42:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

Energy Calibration
Normalized diff: 0.1495

********** 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	
167.30	83.87	311.	56.	0.028	140.18	1.011	TA-182	D
174.07	87.25	332.	122.	0.061	69.24	1.014	PB-214	D
179.45	89.95	272.	104.	0.052	73.44	1.016	PB-214	D
185.28	92.86	279.	140.	0.070	56.82	1.018	TH-234	D
418.20	208.74	158.	78.	0.039	76.53	1.101	LU-177	D
540.97	270.62	112.	91.	0.046	66.47	1.358	AC-228	s
599.52	299.74	75.	54.	0.027	79.38	1.165	TH-227	D
925.76	462.93	61.	39.	0.020	116.03	0.958	AC-228	

s - Peak fails shape tests.
D - Peak area deconvoluted.

This section based on library: YAEC_OperatingSpectrumRevA.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
AM-241	118.64	59.54	187.	15.	0.008	378.01	0.994D
TH-234	126.14	63.29	293.	67.	0.033	114.63	0.996D
TA-182	134.40	67.42	256.	14.	0.007	491.46	0.484s
HG-203	145.31	72.87	291.	0.	0.000	0.00	0.875D
PB-212	149.19	74.81	349.	196.	0.098	45.84	1.005D
BI-207	149.51	74.97	490.	0.	0.000	0.00	0.000D
PB-214	153.79	77.11	350.	326.	0.163	29.52	1.006D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PB-212	153.79	77.11	372.	0.	0.000	125.16	0.482D
CE-144	159.81	80.12	308.	16.	0.008	476.11	1.009D
EU-155	172.48	86.45	452.	0.	0.000	0.00	1.013D
NP-237	172.56	86.49	411.	41.	0.020	217.43	1.013D
CD-109	175.66	88.04	420.	38.	0.019	236.10	1.014D
TH-234	184.34	92.38	422.	0.	0.000	0.00	1.017D
TH-234	185.18	92.80	419.	0.	0.000	0.00	1.018D
NP-237	191.32	95.87	256.	40.	0.020	174.80	1.020D
Cm-243	198.69	99.55	270.	39.	0.020	184.56	1.023D
Cm-243	207.11	103.76	278.	20.	0.010	365.08	1.026D
EU-155	210.21	105.31	270.	41.	0.020	176.49	1.027D
TE-132	225.33	112.87	320.	60.	0.030	214.91	1.050s
TE-132	232.20	116.30	103.	0.	0.000	0.00	0.106D
Cm-243	234.56	117.48	171.	27.	0.014	296.27	1.986s
EU-152	243.16	121.78	238.	7.	0.004	897.66	1.038D
CO-57	243.74	122.07	246.	0.	0.000	0.00	1.039D
EU-154	245.80	123.10	254.	4.	0.002	1598.99	1.039D
CE-144	266.67	133.53	130.	42.	0.021	125.18	1.047D
CO-57	272.48	136.43	203.	16.	0.008	389.91	1.049D
U-235	287.14	143.76	219.	24.	0.012	267.02	1.054D
CE-141	290.52	145.45	222.	23.	0.012	275.83	1.055D
TE-131	299.07	149.72	282.	28.	0.014	258.66	1.058D
U-235	326.34	163.35	198.	15.	0.008	399.74	1.068D
CE-139	331.34	165.85	188.	27.	0.013	225.10	1.070D
SB-125	352.52	176.44	176.	46.	0.023	198.46	1.078s
U-235	371.10	185.72	327.	111.	0.056	13.29	1.084A
RA-226	371.64	185.99	184.	5.	0.002	1271.52	1.282A
U-235	410.29	205.31	76.	2.	0.001	1724.38	1.098D
TE-132	454.74	227.52	140.	14.	0.007	543.80	1.031s
TH-227	471.70	236.00	119.	21.	0.011	227.46	1.120D
PB-212	476.96	238.63	119.	632.	0.316	14.00	1.122D
RA-224	481.70	241.00	126.	56.	0.028	93.61	1.172A
PB-214	483.54	241.92	149.	91.	0.046	7.56	1.124A
SN-113	509.79	255.04	72.	0.	0.000	0.00	1.180D
TH-227	508.92	254.60	72.	25.	0.013	212.30	1.180
Cm-243	554.93	277.60	105.	27.	0.013	172.20	1.149D
HG-203	558.07	279.17	87.	8.	0.004	309.97	1.150D
J-131	569.00	284.63	48.	1.	0.000	2834.61	0.000s
PB-214	590.19	295.22	70.	204.	0.102	27.23	1.161D
CR-51	640.51	320.37	43.	6.	0.003	467.23	0.562s
AC-228	675.83	338.02	72.	89.	0.045	56.24	1.193s
EU-152	687.00	343.61	35.	2.	0.001	1272.79	0.000s
PB-214	703.50	351.85	75.	314.	0.157	21.66	1.131
J-131	728.50	364.35	20.	0.	0.000	0.00	0.583s
SN-113	782.00	391.08	21.	0.	0.000	0.00	0.333s
SB-125	853.16	426.65	41.	11.	0.005	291.08	0.763s
Ag-108M	866.67	433.40	19.	3.	0.002	528.20	0.450s
TE-131	905.60	452.85	55.	28.	0.014	145.27	0.621s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-125	927.03	463.57	74.	0.	0.000	0.00	1.278
TE-131	981.72	490.90	41.	20.	0.010	185.38	0.544s
TL-208	1021.38	510.72	55.	50.	0.025	76.75	1.311D
Kr-85	1027.92	513.99	57.	3.	0.002	962.67	1.313D
CS-134	1137.59	568.80	32.	12.	0.006	232.96	0.952
BI-207	1138.89	569.45	48.	0.	0.000	0.00	1.351
TL-208	1166.27	583.13	65.	180.	0.090	32.74	1.082
SB-125	1201.57	600.77	14.	0.	0.000	0.00	1.201D
CS-134	1209.35	604.66	25.	12.	0.006	189.23	1.374D
BI-214	1218.68	609.32	22.	212.	0.106	22.71	1.378D
Ag-108M	1228.78	614.37	29.	15.	0.007	171.84	1.381D
SB-125	1272.36	636.15	32.	0.	0.000	0.00	0.660D
J-131	1276.29	638.11	18.	5.	0.002	384.19	0.755s
AG-110M	1315.58	657.75	22.	8.	0.004	277.67	1.410D
CS-137	1323.33	661.62	30.	10.	0.005	254.65	1.413D
NB-94	1406.91	703.39	13.	4.	0.002	433.80	1.011
Ag-108M	1446.05	722.95	16.	0.	0.000	0.00	1.454D
EU-154	1446.75	723.30	24.	3.	0.002	612.79	1.454D
BI-212	1454.49	727.17	31.	46.	0.023	68.18	1.457D
EU-152	1554.00	776.90	27.	1.	0.001	1915.07	0.000s
BI-212	1571.71	785.75	29.	17.	0.008	179.80	1.063
CS-134	1591.75	795.76	37.	18.	0.009	164.10	1.502D
CS-134	1603.91	801.84	23.	5.	0.003	393.18	1.506D
CO-58	1621.56	810.66	16.	12.	0.006	184.74	0.862s
MN-54	1671.75	835.74	12.	8.	0.004	212.13	0.937s
MN-56	1689.00	844.36	17.	4.	0.002	543.41	0.000s
NB-94	1745.19	872.44	20.	10.	0.005	219.93	0.625s
AG-110M	1773.41	886.54	10.	8.	0.004	208.06	1.807
Y-88	1795.92	897.79	14.	6.	0.003	292.81	0.957s
AC-228	1822.49	911.07	19.	98.	0.049	38.66	1.312s
AG-110M	1876.12	937.87	16.	19.	0.009	129.24	0.645s
EU-152	1928.41	964.00	16.	26.	0.013	87.34	1.612D
AC-228	1938.21	968.90	23.	53.	0.027	55.86	1.616D
EU-154	2010.00	1004.77	3.	0.	0.000	0.00	0.000s
BI-207	2130.97	1065.22	18.	9.	0.004	264.58	0.524s
FE-59	2199.24	1099.34	16.	8.	0.004	248.94	1.226
EU-152	2224.72	1112.07	16.	0.	0.000	0.00	1.708D
ZN-65	2231.62	1115.52	31.	2.	0.001	1210.07	1.710D
BI-214	2241.15	1120.28	25.	47.	0.024	62.30	1.713D
TA-182	2243.15	1121.28	75.	0.	0.000	0.00	1.713D
TE-131	2293.60	1146.49	30.	13.	0.006	246.96	0.666s
CO-60	2337.99	1168.67	26.	20.	0.010	107.41	0.496s
TA-182	2375.88	1187.60	26.	8.	0.004	347.76	0.598s
TA-182	2444.17	1221.73	11.	1.	0.000	1326.65	0.397s
EU-154	2551.41	1275.31	15.	11.	0.005	212.46	1.395
FE-59	2585.65	1292.43	6.	14.	0.007	122.55	1.142s
CO-60	2666.11	1332.63	15.	10.	0.005	121.53	0.589s
AG-110M	2770.58	1384.83	5.	15.	0.008	108.74	1.145s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-152	2815.92	1407.49	1.	4.	0.002	183.71	0.590s
K-40	2922.14	1460.56	18.	576.	0.288	13.14	1.619
BI-212	3238.33	1618.55	0.	8.	0.004	106.07	0.500s
BI-214	3530.78	1764.67	3.	30.	0.015	63.70	0.990s
MN-56	3624.50	1811.50	0.	4.	0.002	150.00	0.999s
Y-88	3673.67	1836.06	1.	0.	0.000	360.56	0.394s

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 microCi	Peak Energy keV	Peak Activity microCi	Peak Code	Peak MDA Value microCi	Comments
K-40		2.4744E-02	1460.75	2.474E-02	(	9.530E-04	G
CR-51		0.0000E+00	320.07	0.000E+00	%	3.833E-04	G
MN-54		2.2503E-05	834.81	2.250E-05	&(	5.303E-05	G
MN-56		0.0000E+00	846.60	0.000E+00	&	6.360E-05	G
			1811.20	8.205E-05	?	1.512E-04	G
FE-59		9.0486E-05	1099.22	5.389E-05	?(	1.372E-04	G
			1291.56	1.384E-04	*(	1.392E-04	G
CO-57		0.0000E+00	122.07	0.000E+00	} P	5.661E-05	G
			136.43	0.000E+00	%	4.208E-04	G
CO-58		3.4434E-05	810.75	3.443E-05	*(	5.961E-05	G
CO-60		5.9655E-05	1332.51	4.177E-05	(P	8.830E-05	G
			1173.23	7.756E-05	&(P	9.974E-05	G
Cm-243		1.8527E-04	277.60	1.899E-04	(	3.575E-04	G
			117.00	1.599E-04	}	3.769E-04	G
			103.76	0.000E+00	%	2.284E-04	G
			99.55	1.807E-04	(	3.663E-04	G
ZN-65		0.0000E+00	1115.52	0.000E+00	%	2.049E-04	G
Kr-85		0.0000E+00	513.99	0.000E+00	%	1.574E+00	G
Y-88		0.0000E+00	1836.01	0.000E+00	% P	4.191E-05	G
			898.02	0.000E+00	% P	6.490E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
NB-94	3.0668E-05	871.10	3.067E-05	&(	6.802E-05	G
		702.50	0.000E+00	&	4.745E-05	G
Ag-108M	3.5063E-05	722.95	0.000E+00	}	5.826E-05	G
		614.37	3.506E-05	(	6.540E-05	G
		433.93	0.000E+00	%	3.860E-05	G
AG-110M	7.4787E-05	657.75	1.865E-05	(	5.893E-05	G
		884.67	3.455E-05	&(	7.238E-05	G
		937.48	1.726E-04	(	1.939E-04	G
		1384.27	2.758E-04	?(	2.298E-04	G
CD-109	6.9485E-04	88.04	6.948E-04	(	1.813E-03	G
SN-113	0.0000E+00	391.71	0.000E+00	& P	5.172E-05	G
		255.04	0.000E+00	!	1.872E-03	G
SB-125	1.3497E-04	427.95	5.399E-05	&(	1.653E-04	G
		600.77	0.000E+00	!	2.277E-04	G
		636.15	0.000E+00	}	5.655E-04	G
		463.51	0.000E+00		6.933E-04	G
		176.29	5.155E-04	*(	7.232E-04	G
TE-131	1.4866E-04	149.72	2.701E-05	(	7.749E-05	G
		452.32	2.431E-04	(	3.235E-04	G
		1146.96	9.490E-04	(	2.126E-03	G
		492.66	7.049E-04	&(	1.159E-03	G
TE-132	0.0000E+00	228.16	0.000E+00	&	5.472E-05	G
		116.30	0.000E+00	}	1.641E-03	G
		111.76	2.067E-03	&	2.988E-03	G
J-131	0.0000E+00	364.48	0.000E+00	?	3.710E-05	G
		636.97	0.000E+00	}	6.795E-04	G
		284.29	0.000E+00	%	5.854E-04	G
CS-134	4.0095E-05	604.66	2.666E-05	(	5.531E-05	G
		795.76	5.544E-05	(	9.848E-05	G
		569.29	1.473E-04	}	3.696E-04	G
		801.84	0.000E+00	%	7.721E-04	G
CS-137	2.6536E-05	661.62	2.654E-05	(	7.609E-05	G
CE-139	2.2812E-05	165.85	2.281E-05	(P	5.712E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-141	3.2018E-05	145.45	3.202E-05	(	9.822E-05		G
CE-144	2.4737E-04	133.53	2.474E-04	(	3.319E-04		G
		80.12	0.000E+00	%	3.980E-03		G
EU-152	0.0000E+00	121.78	0.000E+00	}	1.629E-04		G
		344.30	0.000E+00	&	1.358E-04		G
		1408.08	8.385E-05	?	1.545E-04		G
		964.00	5.724E-04		4.660E-04		G
		1112.07	0.000E+00	!	5.689E-04		G
		778.90	0.000E+00	&	5.447E-04		G
EU-154	0.0000E+00	123.10	0.000E+00	%	1.215E-04		G
		1274.80	1.244E-04	?	2.394E-04		G
		723.30	0.000E+00	}	3.174E-04		G
		1004.80	0.000E+00	?	2.029E-04		G
EU-155	1.2211E-04	86.45	0.000E+00	}	2.200E-04		G
		105.31	1.221E-04	$(	2.363E-04		G
TA-182	0.0000E+00	67.75	0.000E+00	%	1.840E-04		G
		1121.28	0.000E+00	%	4.484E-04		G
		1221.42	0.000E+00	%	2.636E-04		G
		1189.05	0.000E+00	&	6.172E-04		G
HG-203	0.0000E+00	279.17	0.000E+00	% P	5.636E-05		G
		72.87	0.000E+00	!	1.092E-03		G
TL-208	4.1664E-04	583.14	4.231E-04	(	9.469E-05		G
		510.72	3.918E-04	(	2.961E-04		G
PB-212	1.2732E-03	238.63	1.273E-03	(	1.078E-04		G
		77.11	0.000E+00	}	4.156E-04		Energy duplication
		74.81	1.666E-03	}	7.643E-04		G
PB-214	1.0692E-03	351.99	1.047E-03	(	1.436E-04		G
		295.22	1.112E-03	(	2.267E-04		G
		77.11	2.390E-03	}	6.603E-04		Energy duplication
		241.92	1.069E-03	}	7.011E-04		G
BI-207	4.0684E-05	569.67	0.000E+00	}	7.061E-05		G
		1063.62	4.068E-05	&(	1.016E-04		G
		74.97	0.000E+00	}	2.234E-04		G
BI-212	1.0582E-03	727.17	9.631E-04	(	6.049E-04		G
		1620.56	1.466E-03	&(	1.350E-03		G
		785.42	2.219E-03	+	3.721E-03		G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-214	1.0156E-03	609.32	9.674E-04	(	1.133E-04		G
		1764.51	1.032E-03	(	3.610E-04		G
		1120.28	1.146E-03	(	6.259E-04		G
RA-224	1.2620E-03	241.00	1.262E-03	}(	2.259E-03		G
RA-226	0.0000E+00	185.99	0.000E+00	}	1.463E-03		G
AC-228	9.8573E-04	911.07	1.031E-03	@(	2.394E-04		G
		968.90	9.802E-04	(	4.573E-04		G
		338.40	8.856E-04	*(	4.180E-04		G
TH-227	2.2929E-04	236.00	1.629E-04	(	4.107E-04		G
		256.25	3.386E-04	&(	5.723E-04		G
TH-234	2.0705E-03	63.29	2.070E-03	(	2.554E-03		G
		92.80	0.000E+00	}	2.221E-03		G
		92.38	0.000E+00	}	2.608E-03		G
U-235	1.4999E-04	185.72	1.500E-04	}	1.170E-04		G
		143.76	1.500E-04	$(	4.451E-04		G
		205.31	0.000E+00	%	7.147E-04		G
		163.35	0.000E+00	%	9.888E-04		G
NP-237	9.1262E-04	86.49	2.190E-04	}	5.251E-04		G
		95.87	9.126E-04	(	1.748E-03		G
AM-241	0.0000E+00	59.54	0.000E+00	% P	2.891E-04		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
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

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
K-40		1.1733E+01	1.1733E+01	1.5419E+00	1.6783E+00
CR-51	<	1.8176E-01	2.4780E-01		
MN-54	#A	1.0670E-02	1.0967E-02	2.3265E-02	2.3273E-02
MN-56	<	3.02E-02	>12 Halflives		
FE-59	#A	4.2905E-02	5.1901E-02	6.3603E-02	6.3671E-02
CO-57	<	1.9953E-01	2.0598E-01		
CO-58	#A	1.6327E-02	1.8433E-02	3.4052E-02	3.4068E-02
CO-60	A	2.8286E-02	2.8412E-02	3.5138E-02	3.5175E-02
Cm-243	A	8.7845E-02	8.7910E-02	1.1095E-01	1.1106E-01
ZN-65	<	9.7161E-02	1.0064E-01		
Kr-85	<	7.4626E+02	7.4633E+02		
Y-88	<	1.9874E-02	2.1541E-02		
NB-94	#A	1.4542E-02	1.4542E-02	3.1981E-02	3.1992E-02
Ag-108M	A	1.6626E-02	1.6629E-02	2.8575E-02	2.8590E-02
AG-110M	C	3.5461E-02	3.6700E-02	3.5406E-02	3.5467E-02
CD-109	A	3.2947E-01	3.3577E-01	7.9276E-01	7.9298E-01
SN-113	<	2.4524E-02	2.6423E-02		
SB-125	A	6.3998E-02	6.4544E-02	1.1369E-01	1.1375E-01
TE-131	C	7.0489E-02	>12 Halflives	7.5459E-02	7.5560E-02
TE-132	<	2.5945E-02	3.6536E-01		
J-131	<	1.7590E-02	5.1171E-02		
CS-134	A	1.9011E-02	1.9229E-02	2.4082E-02	2.4106E-02
CS-137	A	1.2582E-02	1.2592E-02	3.2066E-02	3.2074E-02
CE-139	A	1.0816E-02	1.1513E-02	2.6052E-02	2.6060E-02
CE-141	A	1.5182E-02	1.9791E-02	5.4590E-02	5.4601E-02
CE-144	A	1.1729E-01	1.2089E-01	1.5133E-01	1.5148E-01
EU-152	<	6.4380E-02	6.4499E-02		
EU-154	<	5.7618E-02	5.7778E-02		
EU-155	A	5.7898E-02	5.8173E-02	1.0267E-01	1.0272E-01
TA-182	<	8.7261E-02	9.4025E-02		
HG-203	<	2.6725E-02	3.2133E-02		
TL-208		1.9755E-01	>12 Halflives	6.4674E-02	6.5631E-02
PB-212		6.0370E-01	>12 Halflives	8.4496E-02	9.1121E-02
PB-214		5.0699E-01	>12 Halflives	8.8207E-02	9.2742E-02
BI-207	#A	1.9291E-02	1.9303E-02	5.1070E-02	5.1081E-02

BI-212		5.0174E-01	>12 Halflives	3.1632E-01	3.1758E-01
BI-214		4.8158E-01	>12 Halflives	1.0934E-01	1.1268E-01
RA-224	#	5.9837E-01	6.2474E+00	7.4781E+03	5.8591E+00
AC-228		4.6739E-01	>12 Halflives	1.3740E-01	1.3991E-01
TH-227	A	1.0872E-01	1.7292E-01	2.6902E-01	2.6920E-01
TH-234	A	9.8173E-01	1.4019E+00	1.6069E+00	1.6088E+00
U-235	A	7.1120E-02	7.1120E-02	1.8991E-01	1.8995E-01
NP-237	A	4.3273E-01	4.3273E-01	7.5642E-01	7.5680E-01
AM-241	<	1.3710E-01	1.3711E-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 2023.1 keV) 1.4823528E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 2.0986023E+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_15DEC2004_1740.An1

Sample description
Detector 101 FSS-OOL-04-01-021-FB-S WET

Spectrum Filename: C:\GammaVision\Spectra\101F_15DEC2004_1740.An1

Acquisition information

Start time:	15-Dec-2004 17:34:00
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:	YAEC_OperatingSpectrumRevA.Lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters

Analysis engine:	wan32 G53W2.06
Start channel:	100 (50.23keV)
Stop channel:	4048 (2023.09keV)
Peak rejection level:	100.000%
Peak search sensitivity:	3
Sample Size:	1.7370E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.7370E+03) = 5.7571E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	best method (based on spectrum).

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

Corrections	Status	Comments
Decay correct to date:	YES	03-Dec-2004 10:50:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

Energy Calibration
Normalized diff: 0.1320

********** 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	
119.58	60.24	129.	46.	0.023	114.27	0.994	AM-241	D
173.40	87.03	245.	82.	0.041	87.35	1.014	PB-214	D
240.06	120.17	169.	40.	0.020	146.23	1.037	NP-239	D
418.08	209.67	127.	81.	0.040	68.01	1.101	NP-239	D
540.06	270.17	44.	71.	0.036	72.08	1.825	AC-228	s
599.67	299.91	60.	28.	0.014	131.39	1.165	TH-227	D
819.26	409.71	27.	13.	0.007	192.40	0.889	AC-228	s
926.06	463.08	47.	43.	0.022	97.63	1.186	AC-228	
1537.19	768.49	3.	23.	0.011	70.33	1.484	BI-214	D
1543.88	771.84	4.	20.	0.010	78.63	1.487	AC-228	D
1589.45	794.43	24.	27.	0.013	97.38	1.502	AC-228	D

s - Peak fails shape tests.
D - Peak area deconvoluted.

This section based on library: YAEC_OperatingSpectrumRevA.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
AM-241	118.64	59.54	146.	0.	0.000	0.00	0.994D
TH-234	126.14	63.29	160.	53.	0.026	109.45	0.996D
TA-182	135.79	68.11	118.	19.	0.009	304.95	0.591s
HG-203	145.31	72.87	269.	19.	0.009	375.12	1.003D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PB-212	149.19	74.81	238.	167.	0.084	45.46	1.005D
BI-207	149.51	74.97	405.	0.	0.000	0.00	1.005D
PB-214	153.79	77.11	255.	290.	0.145	29.24	1.006D
PB-212	153.79	77.11	272.	0.	0.000	83.71	0.629D
CE-144	159.81	80.12	189.	0.	0.000	0.00	1.119D
EU-155	172.48	86.45	299.	0.	0.000	0.00	1.013D
NP-237	172.56	86.49	299.	0.	0.000	0.00	1.013D
CD-109	175.66	88.04	227.	27.	0.013	244.88	1.014D
TH-234	184.34	92.38	302.	0.	0.000	0.00	1.018D
TH-234	185.18	92.80	261.	86.	0.043	85.64	1.018D
NP-237	191.32	95.87	233.	0.	0.000	0.00	1.020D
Cm-243	198.69	99.55	218.	7.	0.004	866.98	1.023D
Cm-243	207.11	103.76	215.	8.	0.004	750.47	1.026D
EU-155	210.21	105.31	196.	38.	0.019	162.74	1.027D
TE-132	222.00	111.20	196.	8.	0.004	780.02	0.000s
TE-132	232.20	116.30	185.	0.	0.000	0.00	0.622D
Cm-243	233.60	117.00	177.	5.	0.002	1238.41	1.035D
EU-152	243.16	121.78	195.	0.	0.000	0.00	1.039D
CO-57	243.74	122.07	195.	0.	0.000	0.00	1.039D
EU-154	245.80	123.10	122.	21.	0.011	231.36	1.039D
CE-144	266.67	133.53	198.	30.	0.015	204.66	1.047D
CO-57	272.48	136.43	125.	14.	0.007	347.44	1.049D
U-235	287.14	143.76	134.	0.	0.000	0.00	1.054
CE-141	290.52	145.45	183.	0.	0.000	0.00	1.055
TE-131	299.07	149.72	198.	0.	0.000	0.00	1.058
U-235	326.34	163.35	169.	12.	0.006	480.67	1.068D
CE-139	331.34	165.85	184.	4.	0.002	1349.52	1.070D
SB-125	349.72	175.04	205.	16.	0.008	444.76	1.027
U-235	371.10	185.72	225.	0.	0.000	0.00	1.084A
RA-226	371.64	185.99	140.	72.	0.036	78.16	1.736A
U-235	410.29	205.31	89.	28.	0.014	156.49	1.098D
TE-132	459.30	229.80	124.	12.	0.006	433.97	0.473s
TH-227	471.70	236.00	61.	27.	0.014	133.22	1.120D
PB-212	476.96	238.63	64.	494.	0.247	15.14	1.122D
RA-224	481.70	241.00	66.	52.	0.026	78.06	1.552A
PB-214	483.54	241.92	100.	52.	0.026	15.16	1.124A
SN-113	509.79	255.04	68.	0.	0.000	0.00	0.000D
TH-227	511.56	255.92	45.	16.	0.008	262.50	0.714
Cm-243	554.93	277.60	64.	45.	0.022	87.97	1.149D
HG-203	558.07	279.17	95.	16.	0.008	205.22	1.150D
J-131	569.67	284.96	24.	4.	0.002	420.32	0.666s
PB-214	590.19	295.22	50.	152.	0.076	31.25	1.161D
CR-51	638.86	319.55	54.	22.	0.011	170.86	0.569s
AC-228	676.29	338.25	45.	99.	0.049	43.47	1.216
EU-152	688.00	344.11	13.	0.	0.000	0.00	0.000s
PB-214	703.60	351.90	90.	183.	0.091	34.89	0.973
J-131	727.00	363.60	19.	1.	0.001	1281.60	0.250s
SN-113	783.00	391.58	14.	0.	0.000	0.00	0.000s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-125	852.58	426.36	30.	12.	0.006	233.18	0.562s
Ag-108M	870.24	435.18	25.	12.	0.006	216.33	0.565s
TE-131	905.50	452.81	19.	23.	0.012	105.15	0.632s
SB-125	926.92	463.51	47.	0.	0.000	0.00	1.186D
TE-131	985.00	492.54	5.	0.	0.000	0.00	0.000s
TL-208	1021.38	510.72	37.	61.	0.030	57.28	1.311D
Kr-85	1027.92	513.99	32.	2.	0.001	1253.94	1.313D
CS-134	1138.58	569.29	30.	0.	0.000	0.00	1.458D
BI-207	1140.21	570.11	32.	26.	0.013	138.83	1.481s
TL-208	1166.02	583.00	39.	151.	0.075	32.92	1.291
SB-125	1201.57	600.77	13.	0.	0.000	0.00	0.000D
CS-134	1209.35	604.66	18.	3.	0.001	639.80	1.374D
BI-214	1218.68	609.32	18.	177.	0.088	24.81	1.378D
Ag-108M	1228.78	614.37	11.	2.	0.001	688.06	1.381D
SB-125	1272.36	636.15	5.	0.	0.000	0.00	0.543D
J-131	1272.72	636.33	5.	8.	0.004	154.61	0.543s
AG-110M	1315.58	657.75	14.	3.	0.001	634.84	1.410D
CS-137	1323.33	661.62	23.	77.	0.038	43.41	1.413D
NB-94	1406.59	703.23	11.	11.	0.006	159.31	1.263
Ag-108M	1446.05	722.95	26.	1.	0.000	3876.33	1.454D
EU-154	1446.75	723.30	24.	6.	0.003	402.19	1.454D
BI-212	1454.49	727.17	19.	30.	0.015	83.64	1.457D
EU-152	1559.00	779.40	4.	0.	0.000	0.00	0.000s
BI-212	1571.69	785.74	8.	15.	0.007	124.90	1.102
CS-134	1591.75	795.76	44.	3.	0.002	878.75	1.503D
CS-134	1603.91	801.84	11.	0.	0.000	3760.01	1.506D
CO-58	1621.09	810.42	7.	6.	0.003	230.04	0.418s
MN-54	1670.56	835.15	14.	6.	0.003	301.39	0.519s
MN-56	1693.26	846.49	10.	6.	0.003	289.91	0.724s
NB-94	1739.33	869.51	14.	4.	0.002	412.31	1.508
AG-110M	1768.25	883.96	2.	1.	0.001	600.00	0.375s
Y-88	1792.76	896.21	12.	6.	0.003	289.86	0.524s
AC-228	1822.22	910.94	10.	109.	0.054	33.03	1.529s
AG-110M	1875.00	937.31	2.	0.	0.000	0.00	0.000s
EU-152	1928.41	964.00	22.	0.	0.000	0.00	0.576D
AC-228	1938.54	969.06	15.	61.	0.031	52.39	1.522s
EU-154	2005.50	1002.52	14.	16.	0.008	148.43	0.625s
BI-207	2124.58	1062.03	8.	14.	0.007	131.50	0.885s
FE-59	2197.50	1098.47	8.	2.	0.001	681.91	0.469s
EU-152	2224.72	1112.07	15.	0.	0.000	0.00	0.458D
ZN-65	2231.62	1115.52	15.	5.	0.003	343.07	1.710D
BI-214	2241.15	1120.28	16.	44.	0.022	59.80	1.713D
TA-182	2243.15	1121.28	53.	0.	0.000	0.00	1.713D
TE-131	2295.60	1147.49	6.	25.	0.013	84.00	0.907s
CO-60	2344.68	1172.02	14.	13.	0.007	98.74	0.514s
TA-182	2377.44	1188.39	6.	12.	0.006	138.04	0.574s
TA-182	2446.75	1223.02	15.	6.	0.003	329.77	0.486s
EU-154	2550.00	1274.61	2.	2.	0.001	387.30	0.200s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
FE-59	2582.00	1290.60	2.	1.	0.001	624.50	0.150s
CO-60	2664.67	1331.91	10.	0.	0.000	0.00	0.625s
AG-110M	2765.67	1382.38	2.	1.	0.001	670.82	0.373s
EU-152	2814.99	1407.02	2.	8.	0.004	128.69	1.433
K-40	2922.01	1460.50	18.	368.	0.184	17.24	1.896
BI-212	3248.00	1623.38	0.	5.	0.002	134.16	0.500s
BI-214	3529.96	1764.26	0.	25.	0.013	60.00	1.385s
MN-56	3625.50	1812.00	0.	2.	0.001	212.13	0.999s
Y-88	3672.00	1835.23	1.	0.	0.000	335.41	0.200s

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 microCi	Peak Energy keV	Peak Activity microCi	Code	MDA Value microCi	Comments
K-40		1.5774E-02	1460.75	1.577E-02	(	9.530E-04	G
CR-51		2.5260E-04	320.07	2.526E-04	*(	4.243E-04	G
MN-54		0.0000E+00	834.81	0.000E+00	%	5.667E-05	G
MN-56		2.1253E-05	846.60	1.582E-05	?(	5.123E-05	G
			1811.20	4.103E-05	?(	1.512E-04	G
FE-59		0.0000E+00	1099.22	0.000E+00	%	1.007E-04	G
			1291.56	0.000E+00	&	8.874E-05	G
CO-57		0.0000E+00	122.07	0.000E+00	} P	5.064E-05	G
			136.43	0.000E+00	%	3.336E-04	G
CO-58		1.6528E-05	810.75	1.653E-05	?(	4.143E-05	G
CO-60		0.0000E+00	1332.51	0.000E+00	? P	7.435E-05	G
			1173.23	4.972E-05	& P	7.625E-05	G
Cm-243		3.1761E-04	277.60	3.176E-04	(	2.833E-04	G
			117.00	0.000E+00	}	3.836E-04	G
			103.76	0.000E+00	%	2.015E-04	G
			99.55	0.000E+00	%	3.305E-04	G
ZN-65		0.0000E+00	1115.52	0.000E+00	%	1.477E-04	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Kr-85	0.0000E+00	513.99	0.000E+00	%		1.212E+00	G
Y-88	0.0000E+00	1836.01	0.000E+00	%	P	4.191E-05	G
		898.02	0.000E+00	&	P	6.117E-05	G
NB-94	0.0000E+00	871.10	0.000E+00	&		5.793E-05	G
		702.50	2.726E-05	&		4.313E-05	G
Ag-108M	0.0000E+00	722.95	0.000E+00	}		7.278E-05	G
		614.37	0.000E+00	%		4.246E-05	G
		433.93	1.971E-05	&		4.421E-05	G
AG-110M	0.0000E+00	657.75	0.000E+00	%		4.870E-05	G
		884.67	0.000E+00	%		3.780E-05	G
		937.48	0.000E+00	?		8.448E-05	G
		1384.27	0.000E+00	&		1.673E-04	G
CD-109	4.9583E-04	88.04	4.958E-04	(		1.346E-03	G
SN-113	0.0000E+00	391.71	0.000E+00	?	P	4.338E-05	G
		255.04	0.000E+00	%		1.819E-03	G
SB-125	6.0733E-05	427.95	6.073E-05	&(		1.429E-04	G
		600.77	0.000E+00	%		2.193E-04	G
		636.15	0.000E+00	}		2.503E-04	G
		463.51	0.000E+00	!		5.596E-04	G
		176.29	0.000E+00	&		7.781E-04	G
TE-131	0.0000E+00	149.72	0.000E+00			6.537E-05	G
		452.32	2.026E-04	$		1.983E-04	G
		1146.96	1.873E-03	?		1.058E-03	G
		492.66	0.000E+00	?		4.667E-04	G
TE-132	0.0000E+00	228.16	0.000E+00	&		5.165E-05	G
		116.30	0.000E+00	}		2.169E-03	G
		111.76	0.000E+00	&		2.360E-03	G
J-131	0.0000E+00	364.48	0.000E+00	&		3.598E-05	G
		636.97	2.519E-04	}		3.862E-04	G
		284.29	0.000E+00	&		4.219E-04	G
CS-134	0.0000E+00	604.66	0.000E+00	%		4.827E-05	G
		795.76	0.000E+00	%		1.058E-04	G
		569.29	0.000E+00	}		3.634E-04	G
		801.84	0.000E+00	%		5.563E-04	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-137	2.0592E-04	661.62	2.059E-04	(	6.750E-05		G
CE-139	0.0000E+00	165.85	0.000E+00	% P	5.646E-05		G
CE-141	0.0000E+00	145.45	0.000E+00		8.950E-05		G
CE-144	1.8008E-04	133.53	1.801E-04	(	4.063E-04		G
		80.12	0.000E+00	&	3.144E-03		G
EU-152	0.0000E+00	121.78	0.000E+00	}	1.481E-04		G
		344.30	0.000E+00	?	8.750E-05		G
		1408.08	1.747E-04	&	1.829E-04		G
		964.00	0.000E+00	!	5.382E-04		G
		1112.07	0.000E+00	&	5.477E-04		G
		778.90	0.000E+00	?	2.447E-04		G
EU-154	1.1454E-04	123.10	3.339E-05	(	8.569E-05		G
		1274.80	0.000E+00	%	9.663E-05		G
		723.30	0.000E+00	}	3.232E-04		G
		1004.80	3.011E-04	&(	3.791E-04		G
EU-155	1.1389E-04	86.45	0.000E+00	}	1.800E-04		G
		105.31	1.139E-04	$(	2.024E-04		G
TA-182	0.0000E+00	67.75	0.000E+00	%	1.270E-04		G
		1121.28	0.000E+00	%	3.815E-04		G
		1221.42	0.000E+00	&	2.974E-04		G
		1189.05	2.914E-04	*	3.402E-04		G
HG-203	1.9067E-05	279.17	1.907E-05	(P	5.878E-05		G
		72.87	0.000E+00	%	1.051E-03		G
TL-208	3.5496E-04	583.14	3.550E-04	(	7.478E-05		G
		510.72	4.817E-04	+	2.461E-04		G
PB-212	9.9490E-04	238.63	9.949E-04	(	8.051E-05		G
		77.11	0.000E+00	}	3.571E-04		Energy duplication
		74.81	1.424E-03	}	6.345E-04		G
PB-214	6.1015E-04	351.99	6.102E-04	(	1.564E-04		G
		295.22	8.304E-04	+	1.940E-04		G
		77.11	2.130E-03	}	5.660E-04		Energy duplication
		241.92	6.102E-04	}	5.793E-04		G
BI-207	6.1779E-05	569.67	5.145E-05	}	5.907E-05		G
		1063.62	6.178E-05	&(	7.306E-05		G
		74.97	0.000E+00	}	2.036E-04		G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-212	6.7917E-04	727.17	6.239E-04	(	4.883E-04		G
		1620.56	9.162E-04	&(	1.350E-03		G
		785.42	1.997E-03	+	2.115E-03		G
BI-214	8.1986E-04	609.32	8.076E-04	(	1.037E-04		G
		1764.51	8.552E-04	(	2.521E-04		G
		1120.28	1.060E-03	+	5.199E-04		G
RA-224	1.1734E-03	241.00	1.173E-03	}(	1.888E-03		G
RA-226	1.5941E-03	185.99	1.594E-03	}(	1.387E-03		G
AC-228	1.1022E-03	911.07	1.142E-03	*(	1.828E-04		G
		968.90	1.121E-03	*(	3.814E-04		G
		338.40	9.782E-04	(	3.379E-04		G
TH-227	2.1299E-04	236.00	2.107E-04	(	2.992E-04		G
		256.25	2.167E-04	(	4.602E-04		G
TH-234	1.6389E-03	63.29	1.639E-03	(	1.909E-03		G
		92.80	1.955E-03	}	1.765E-03		G
		92.38	0.000E+00	}	2.217E-03		G
U-235	0.0000E+00	185.72	0.000E+00	}	9.770E-05		G
		143.76	0.000E+00		3.513E-04		G
		205.31	4.539E-04	$	7.710E-04		G
		163.35	0.000E+00	%	9.178E-04		G
NP-237	0.0000E+00	86.49	0.000E+00	}	4.498E-04		G
		95.87	0.000E+00	%	1.670E-03		G
AM-241	0.0000E+00	59.54	0.000E+00	! P	2.573E-04		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
K-40		9.0809E+00	9.0809E+00	1.5660E+00	1.6479E+00
CR-51	#A	1.4542E-01	1.9774E-01	3.3786E-01	3.3805E-01
MN-54	<	3.2624E-02	3.3526E-02		
MN-56	#A	1.2235E-02	>12 Halflives	2.1977E-02	2.1988E-02
FE-59	<	5.7998E-02	7.0046E-02		
CO-57	<	1.9204E-01	1.9819E-01		
CO-58	#A	9.5155E-03	1.0731E-02	2.4686E-02	2.4694E-02
CO-60	<	4.2804E-02	4.2994E-02		
Cm-243		1.8285E-01	1.8298E-01	1.6097E-01	1.6131E-01
ZN-65	<	8.5035E-02	8.8056E-02		
Kr-85	<	6.9777E+02	6.9783E+02		
Y-88	<	2.4130E-02	2.6136E-02		
NB-94	<	3.3348E-02	3.3348E-02		
Ag-108M	<	2.4446E-02	2.4451E-02		
AG-110M	<	2.8039E-02	2.9010E-02		
CD-109	A	2.8545E-01	2.9086E-01	7.1227E-01	7.1245E-01
SN-113	<	2.4975E-02	2.6892E-02		
SB-125	A	3.4965E-02	3.5260E-02	8.2221E-02	8.2245E-02
TE-131	<	3.76E-02	>12 Halflives		
TE-132	<	2.9734E-02	4.0939E-01		
J-131	<	2.0716E-02	5.9720E-02		
CS-134	<	2.7789E-02	2.8105E-02		
CS-137		1.1855E-01	1.1864E-01	5.1499E-02	5.1934E-02
CE-139	<	3.2506E-02	3.4582E-02		
CE-141	<	5.1527E-02	6.7020E-02		
CE-144	A	1.0368E-01	1.0683E-01	2.1864E-01	2.1872E-01
EU-152	<	5.0371E-02	5.0464E-02		
EU-154	C	6.5943E-02	6.6124E-02	9.0882E-02	9.0956E-02
EU-155	A	6.5568E-02	6.5877E-02	1.0721E-01	1.0727E-01
TA-182	<	7.3124E-02	7.8742E-02		

HG-203	A	1.0977E-02	1.3177E-02	3.5860E-02	3.5868E-02

TL-208		2.0435E-01	>12 Halflives	6.7266E-02	6.8250E-02
PB-212		5.7277E-01	>12 Halflives	8.6729E-02	9.2570E-02
PB-214		3.5127E-01	>12 Halflives	1.2256E-01	1.2416E-01
BI-207	A	3.5567E-02	3.5588E-02	4.6800E-02	4.6843E-02
BI-212		3.9100E-01	>12 Halflives	3.0908E-01	3.0987E-01
BI-214		4.7200E-01	>12 Halflives	1.1709E-01	1.2009E-01
RA-224	#	6.7551E-01	6.9134E+00	6.4658E+03	5.4110E+00
RA-226	#	9.1775E-01	9.1776E-01	9.0455E+02	7.1918E-01
AC-228		6.3453E-01	>12 Halflives	1.6005E-01	1.6402E-01
TH-227	A	1.2262E-01	1.9427E-01	2.5881E-01	2.5904E-01
TH-234	A	9.4350E-01	1.3432E+00	1.4701E+00	1.4720E+00
U-235	<	2.0227E-01	2.0227E-01		
NP-237	<	9.6130E-01	9.6130E-01		
AM-241	<	1.4814E-01	1.4815E-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 2023.1 keV) 1.2798825E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 1.9573395E+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_15DEC2004_1915.An1

Sample description
Detector 101 FSS-OOL-04-01-019-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\101F_15DEC2004_1915.An1

Acquisition information
Start time: 15-Dec-2004 19:08:09
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: YAEC_OperatingSpectrumRevA.Lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: wan32 G53W2.06
Start channel: 100 (50.23keV)
Stop channel: 4048 (2023.09keV)
Peak rejection level: 100.000%
Peak search sensitivity: 3
Sample Size: 1.6800E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6800E+03) =
5.9524E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	best method (based on spectrum).

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

Corrections	Status	Comments
Decay correct to date:	YES	03-Dec-2004 14:02:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

Energy Calibration
Normalized diff: 0.1350

********** 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	
173.50	86.86	267.	78.	0.039	95.14	1.014	TB-160	D
179.63	89.92	239.	104.	0.052	69.44	1.016	PB-214	D
418.32	208.95	99.	85.	0.042	59.42	1.101	AC-228	D
440.58	220.45	92.	38.	0.019	176.18	0.642	J-135	s
540.72	270.50	99.	93.	0.047	87.54	0.872	AC-228	s
600.12	300.18	56.	28.	0.014	130.93	0.767	PB-212	s
655.65	327.94	72.	68.	0.034	76.20	1.036	AC-228	s
1537.09	768.44	12.	30.	0.015	81.24	0.978	BI-214	s

s - Peak fails shape tests.
D - Peak area deconvoluted.

This section based on library: YAEC_OperatingSpectrumRevA.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
AM-241	118.64	59.54	204.	16.	0.008	375.16	0.994D
TH-234	126.14	63.29	199.	61.	0.031	104.74	0.996D
TA-182	136.78	68.61	142.	44.	0.022	160.59	0.623
HG-203	145.31	72.87	268.	0.	0.000	0.00	0.365D
PB-212	149.19	74.81	300.	122.	0.061	65.94	1.005D
BI-207	149.51	74.97	383.	39.	0.020	217.11	1.005D
PB-214	153.79	77.11	268.	302.	0.151	28.76	1.006D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PB-212	153.79	77.11	388.	0.	0.000	252.31	0.448D
CE-144	159.81	80.12	208.	28.	0.014	228.84	1.009D
EU-155	172.48	86.45	344.	0.	0.000	0.00	1.013D
NP-237	172.56	86.49	344.	0.	0.000	0.00	1.013D
CD-109	175.66	88.04	330.	7.	0.004	1098.04	1.014D
TH-234	184.34	92.38	379.	0.	0.000	0.00	1.017D
TH-234	185.18	92.80	255.	125.	0.063	60.32	1.018D
NP-237	191.32	95.87	223.	0.	0.000	0.00	1.020D
Cm-243	198.69	99.55	222.	6.	0.003	1021.75	1.023D
Cm-243	207.11	103.76	218.	18.	0.009	352.42	1.026D
EU-155	210.21	105.31	182.	41.	0.021	146.75	1.027D
TE-132	224.49	112.45	154.	67.	0.034	123.44	1.506s
TE-132	232.20	116.30	219.	5.	0.003	1242.92	1.035D
Cm-243	233.60	117.00	186.	40.	0.020	151.14	1.035D
EU-152	243.16	121.78	193.	17.	0.008	358.07	1.038D
CO-57	243.74	122.07	211.	0.	0.000	0.00	1.039D
EU-154	245.80	123.10	179.	2.	0.001	3009.92	1.039D
CE-144	266.67	133.53	131.	13.	0.007	378.72	1.047D
CO-57	272.48	136.43	181.	23.	0.012	252.55	1.049D
U-235	287.14	143.76	150.	21.	0.011	250.25	1.054D
CE-141	290.52	145.45	194.	10.	0.005	613.71	1.055D
TE-131	299.07	149.72	150.	1.	0.001	3679.90	1.058D
U-235	326.34	163.35	156.	39.	0.020	144.03	1.068D
CE-139	331.34	165.85	129.	38.	0.019	134.56	1.070D
SB-125	354.88	177.62	119.	39.	0.020	184.37	0.572s
U-235	371.10	185.72	234.	198.	0.099	7.17	1.084A
RA-226	371.64	185.99	165.	0.	0.000	5449.77	0.804A
U-235	410.29	205.31	72.	10.	0.005	381.98	1.098D
TE-132	456.00	228.16	45.	5.	0.002	650.38	0.500s
TH-227	471.70	236.00	86.	2.	0.001	1854.64	1.120D
PB-212	476.96	238.63	103.	596.	0.298	14.27	1.122D
RA-224	481.70	241.00	126.	56.	0.028	93.34	1.034A
PB-214	483.54	241.92	133.	51.	0.026	11.73	1.124A
SN-113	509.79	255.04	45.	0.	0.000	0.00	0.910D
TH-227	512.00	256.14	27.	0.	0.000	0.00	0.000s
Cm-243	554.93	277.60	93.	36.	0.018	123.27	1.149D
HG-203	558.07	279.17	101.	22.	0.011	163.49	1.150D
J-131	567.58	283.92	42.	4.	0.002	703.56	0.454s
PB-214	590.30	295.28	74.	120.	0.060	43.72	1.289
CR-51	638.24	319.24	46.	11.	0.005	276.79	0.584s
AC-228	676.90	338.56	47.	108.	0.054	42.25	1.405
EU-152	686.00	343.11	40.	22.	0.011	146.45	0.767
PB-214	703.63	351.92	64.	174.	0.087	31.64	1.295
J-131	729.14	364.67	28.	4.	0.002	629.38	0.904
SN-113	781.51	390.84	46.	21.	0.010	162.50	1.220s
SB-125	860.88	430.51	40.	15.	0.007	220.61	0.492s
Ag-108M	868.90	434.51	50.	31.	0.016	132.32	1.353s
TE-131	905.83	452.97	24.	4.	0.002	540.83	1.038

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-125	926.08	463.09	30.	56.	0.028	64.73	2.403s
TE-131	986.77	493.42	30.	20.	0.010	146.20	0.554s
TL-208	1021.38	510.72	40.	63.	0.032	56.61	1.310D
Kr-85	1027.92	513.99	36.	13.	0.006	213.34	1.313D
CS-134	1137.84	568.92	24.	14.	0.007	191.40	0.781s
BI-207	1139.16	569.58	34.	0.	0.000	0.00	1.351
TL-208	1166.11	583.05	37.	180.	0.090	28.69	1.516
SB-125	1201.57	600.77	26.	0.	0.000	0.00	0.888D
CS-134	1209.35	604.66	28.	0.	0.000	0.00	1.374D
BI-214	1218.68	609.32	26.	156.	0.078	27.71	1.378D
Ag-108M	1228.78	614.37	28.	2.	0.001	1049.93	1.381D
SB-125	1272.36	636.15	33.	0.	0.000	0.00	0.813D
J-131	1273.26	636.60	24.	12.	0.006	212.13	0.801s
AG-110M	1315.58	657.75	11.	2.	0.001	706.31	1.410D
CS-137	1323.33	661.62	15.	72.	0.036	41.80	1.413D
NB-94	1405.00	702.44	5.	0.	0.000	0.00	0.000s
Ag-108M	1446.05	722.95	12.	7.	0.004	235.73	1.454D
EU-154	1446.75	723.30	22.	0.	0.000	0.00	1.454D
BI-212	1454.49	727.17	21.	37.	0.018	72.13	1.457D
EU-152	1558.25	779.02	9.	4.	0.002	351.78	0.972s
BI-212	1570.17	784.98	18.	16.	0.008	157.45	0.877s
CS-134	1591.75	795.76	27.	0.	0.000	0.00	0.367D
CS-134	1602.50	801.13	8.	8.	0.004	193.65	0.705s
CO-58	1623.00	811.38	1.	0.	0.000	0.00	0.000s
MN-54	1671.09	835.41	26.	11.	0.006	242.69	0.922s
MN-56	1693.50	846.61	12.	12.	0.006	158.11	1.699
NB-94	1742.57	871.13	4.	1.	0.001	830.66	0.656s
AG-110M	1770.37	885.02	20.	10.	0.005	242.86	1.428
Y-88	1796.27	897.97	6.	1.	0.000	584.81	1.392
AC-228	1822.09	910.87	24.	100.	0.050	39.69	1.582
AG-110M	1875.14	937.38	8.	4.	0.002	363.12	0.596s
EU-152	1928.41	964.00	21.	20.	0.010	120.70	1.612D
AC-228	1938.21	968.90	14.	54.	0.027	50.49	1.616D
EU-154	2011.00	1005.27	3.	1.	0.001	703.56	0.000s
BI-207	2127.75	1063.61	11.	7.	0.004	264.77	0.450s
FE-59	2199.24	1099.34	5.	2.	0.001	408.83	0.659s
EU-152	2224.78	1112.10	16.	0.	0.000	0.00	1.708
ZN-65	2231.68	1115.55	21.	0.	0.000	0.00	1.710
BI-214	2241.17	1120.29	19.	33.	0.017	90.80	1.607
TA-182	2243.15	1121.28	35.	0.	0.000	0.00	0.404D
TE-131	2295.00	1147.19	5.	0.	0.000	0.00	0.000s
CO-60	2346.82	1173.09	19.	10.	0.005	128.47	1.562
TA-182	2370.00	1184.67	20.	5.	0.002	488.62	0.192s
TA-182	2436.64	1217.97	20.	4.	0.002	600.00	0.543s
EU-154	2551.04	1275.13	14.	18.	0.009	142.88	1.533s
FE-59	2583.08	1291.14	3.	4.	0.002	237.17	0.661s
CO-60	2665.42	1332.29	9.	14.	0.007	82.86	1.195s
AG-110M	2768.62	1383.85	1.	1.	0.000	509.90	0.750s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-152	2816.18	1407.62	0.	13.	0.007	83.21	0.625s
K-40	2922.14	1460.56	12.	388.	0.194	16.27	2.038
BI-212	3242.75	1620.76	0.	4.	0.002	150.00	0.750s
BI-214	3529.20	1763.88	0.	31.	0.015	53.88	0.749s
MN-56	3622.00	1810.25	0.	0.	0.000	0.00	0.000s
Y-88	3673.71	1836.09	1.	1.	0.000	422.09	0.459s

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

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

- Nuclide - Name	Code	Average Activity microCi	Peak Energy keV	Peak Activity microCi	Peak Code	Peak MDA Value microCi	Comments
K-40		1.6675E-02	1460.75	1.667E-02	(	7.946E-04	G
CR-51		1.2630E-04	320.07	1.263E-04	&(	3.940E-04	G
MN-54		3.1879E-05	834.81	3.188E-05	?(	7.403E-05	G
MN-56		3.4517E-05	846.60	3.452E-05	(	5.423E-05	G
			1811.20	0.000E+00	?	1.512E-04	G
FE-59		0.0000E+00	1099.22	0.000E+00	%	8.100E-05	G
			1291.56	3.817E-05	?	1.029E-04	G
CO-57		1.4181E-04	122.07	0.000E+00	} P	5.259E-05	G
			136.43	1.418E-04	$(	3.978E-04	G
CO-58		0.0000E+00	810.75	0.000E+00	?	2.030E-05	G
CO-60		4.8178E-05	1332.51	5.802E-05	(P	7.171E-05	G
			1173.23	3.833E-05	(P	8.720E-05	G
Cm-243		2.5653E-04	277.60	2.565E-04	(	3.369E-04	G
			117.00	2.385E-04	}	3.921E-04	G
			103.76	0.000E+00	%	2.030E-04	G
			99.55	0.000E+00	%	3.332E-04	G
ZN-65		0.0000E+00	1115.52	0.000E+00		1.720E-04	G
Kr-85		5.4021E-01	513.99	5.402E-01	(	1.278E+00	G
Y-88		0.0000E+00	1836.01	0.000E+00	% P	4.295E-05	G
			898.02	0.000E+00	% P	4.549E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
NB-94	0.0000E+00	871.10	0.000E+00	%	3.514E-05	G
		702.50	0.000E+00	?	3.158E-05	G
Ag-108M	0.0000E+00	722.95	1.946E-05	}	5.170E-05	G
		614.37	0.000E+00	%	6.412E-05	G
		433.93	5.266E-05	*	6.016E-05	G
AG-110M	0.0000E+00	657.75	0.000E+00	%	4.327E-05	G
		884.67	4.267E-05		9.465E-05	G
		937.48	0.000E+00	%	1.456E-04	G
		1384.27	0.000E+00	%	1.455E-04	G
CD-109	0.0000E+00	88.04	0.000E+00	%	1.612E-03	G
SN-113	4.4516E-05	391.71	4.452E-05	&(P	7.359E-05	G
		255.04	0.000E+00	%	1.500E-03	G
SB-125	3.0659E-04	427.95	7.592E-05	&(	1.629E-04	G
		600.77	0.000E+00	&	2.966E-04	G
		636.15	0.000E+00	}	5.749E-04	G
		463.51	9.072E-04	*(	4.574E-04	G
		176.29	4.370E-04	&(	6.000E-04	G
TE-131	0.0000E+00	149.72	0.000E+00	%	5.716E-05	G
		452.32	0.000E+00	&	2.217E-04	G
		1146.96	0.000E+00	?	9.838E-04	G
		492.66	7.109E-04	&	1.004E-03	G
TE-132	0.0000E+00	228.16	0.000E+00	%	3.213E-05	G
		116.30	0.000E+00	}	2.352E-03	G
		111.76	2.327E-03	&	2.103E-03	G
J-131	0.0000E+00	364.48	0.000E+00	%	4.276E-05	G
		636.97	3.627E-04	}	7.720E-04	G
		284.29	0.000E+00	%	5.488E-04	G
CS-134	0.0000E+00	604.66	0.000E+00	%	5.861E-05	G
		795.76	0.000E+00	%	8.446E-05	G
		569.29	1.814E-04	}	3.260E-04	G
		801.84	2.486E-04	$	4.937E-04	G
CS-137	1.9449E-04	661.62	1.945E-04	(	5.518E-05	G
CE-139	3.2727E-05	165.85	3.273E-05	(P	4.764E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-141	0.0000E+00	145.45	0.000E+00	%		9.222E-05	G
CE-144	0.0000E+00	133.53	0.000E+00	%		3.335E-04	G
		80.12	1.301E-03			3.295E-03	G
EU-152	2.3432E-04	121.78	0.000E+00	}		1.475E-04	G
		344.30	9.865E-05	&(		1.443E-04	G
		1408.08	2.725E-04	(		1.545E-04	G
		964.00	4.300E-04	(		5.313E-04	G
		1112.07	0.000E+00	%		5.689E-04	G
		778.90	0.000E+00	%		3.395E-04	G
EU-154	0.0000E+00	123.10	0.000E+00	%		1.028E-04	G
		1274.80	2.047E-04	@		2.325E-04	G
		723.30	0.000E+00	}		3.081E-04	G
		1004.80	0.000E+00	%		2.029E-04	G
EU-155	1.2259E-04	86.45	0.000E+00	}		1.927E-04	G
		105.31	1.226E-04	(		1.954E-04	G
TA-182	1.0360E-04	67.75	1.036E-04	&(		1.389E-04	G
		1121.28	0.000E+00	&		3.139E-04	G
		1221.42	0.000E+00	&		3.374E-04	G
		1189.05	0.000E+00	&		5.511E-04	G
HG-203	2.6878E-05	279.17	2.688E-05	(P		6.039E-05	G
		72.87	0.000E+00	&		1.050E-03	G
TL-208	4.3956E-04	583.14	4.235E-04	(		7.285E-05	G
		510.72	5.009E-04	(		2.538E-04	G
PB-212	1.1990E-03	238.63	1.199E-03	(		1.009E-04	G
		77.11	0.000E+00	}		4.239E-04	Energy duplication
		74.81	1.040E-03	}		7.097E-04	G
PB-214	6.0320E-04	351.99	5.785E-04	(		1.338E-04	G
		295.22	6.510E-04	(		2.324E-04	G
		77.11	2.217E-03	}		5.799E-04	Energy duplication
		241.92	6.032E-04	}		6.636E-04	G
BI-207	3.1643E-05	569.67	0.000E+00	}		6.029E-05	G
		1063.62	3.164E-05	?(		8.212E-05	G
		74.97	8.272E-05	}		1.981E-04	G
BI-212	7.6941E-04	727.17	7.779E-04	(		5.066E-04	G
		1620.56	7.329E-04	?(		1.350E-03	G
		785.42	2.086E-03	+		3.017E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-214	7.3566E-04	609.32	7.123E-04	(	1.203E-04		G
		1764.51	1.060E-03	+	2.521E-04		G
		1120.28	8.071E-04	(	5.531E-04		G
RA-224	1.2661E-03	241.00	1.266E-03	}(	1.988E-03		G
RA-226	0.0000E+00	185.99	0.000E+00	}	1.387E-03		G
AC-228	1.0367E-03	911.07	1.050E-03	(	2.668E-04		G
		968.90	9.895E-04	(	3.718E-04		G
		338.40	1.074E-03	(	3.425E-04		G
TH-227	0.0000E+00	236.00	0.000E+00	%	3.523E-04		G
		256.25	0.000E+00	?	3.647E-04		G
TH-234	1.8990E-03	63.29	1.899E-03	(	2.117E-03		G
		92.80	2.837E-03	}	1.745E-03		G
		92.38	0.000E+00	}	2.475E-03		G
U-235	2.6692E-04	185.72	2.669E-04	}	9.956E-05		G
		143.76	1.333E-04	$(	3.708E-04		G
		205.31	0.000E+00	%	6.959E-04		G
		163.35	5.654E-04	$(	8.825E-04		G
NP-237	0.0000E+00	86.49	0.000E+00	}	4.814E-04		G
		95.87	0.000E+00	%	1.636E-03		G
AM-241	0.0000E+00	59.54	0.000E+00	% P	3.016E-04		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
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

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

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***** 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
K-40		9.9256E+00	9.9256E+00	1.6152E+00	1.7098E+00
CR-51	A	7.5178E-02	1.0205E-01	2.8246E-01	2.8252E-01
MN-54	#A	1.8976E-02	1.9497E-02	4.7317E-02	4.7330E-02
MN-56	A	2.0546E-02	>12 Halflives	3.2485E-02	3.2506E-02
FE-59	<	4.8215E-02	5.8170E-02		
CO-57	A	8.4411E-02	8.7099E-02	2.1997E-01	2.2003E-01
CO-58	<	1.2085E-02	1.3620E-02		
CO-60	A	2.8677E-02	2.8804E-02	3.5151E-02	3.5189E-02
Cm-243	A	1.5270E-01	1.5281E-01	1.8837E-01	1.8856E-01
ZN-65	<	1.0241E-01	1.0602E-01		
Kr-85	A	3.2155E+02	3.2158E+02	6.8605E+02	6.8629E+02
Y-88	<	2.5568E-02	2.7681E-02		
NB-94	<	2.0915E-02	2.0915E-02		
Ag-108M	<	3.8168E-02	3.8175E-02		
AG-110M	<	2.5757E-02	2.6645E-02		
CD-109	<	9.5945E-01	9.7753E-01		
SN-113	#A	2.6497E-02	2.8520E-02	4.9017E-02	4.9043E-02
SB-125	#	1.8249E-01	1.8403E-01	1.1912E-01	1.1958E-01
TE-131	<	3.40E-02	>12 Halflives		
TE-132	<	1.9127E-02	2.5955E-01		
J-131	<	2.5455E-02	7.2951E-02		
CS-134	<	3.4888E-02	3.5283E-02		
CS-137		1.1577E-01	1.1586E-01	4.8428E-02	4.8868E-02
CE-139	A	1.9481E-02	2.0718E-02	2.7980E-02	2.8005E-02
CE-141	<	5.4890E-02	7.1291E-02		
CE-144	<	1.9851E-01	2.0452E-01		
EU-152	C	1.3948E-01	1.3973E-01	9.6515E-02	9.6838E-02
EU-154	<	6.1175E-02	6.1342E-02		
EU-155	A	7.2970E-02	7.3312E-02	1.0758E-01	1.0766E-01
TA-182	A	6.1669E-02	6.6379E-02	1.0660E-01	1.0667E-01
HG-203	A	1.5999E-02	1.9187E-02	3.8625E-02	3.8640E-02
TL-208		2.6164E-01	>12 Halflives	7.5057E-02	7.6500E-02
PB-212		7.1370E-01	>12 Halflives	1.0184E-01	1.0953E-01
PB-214		3.5905E-01	>12 Halflives	9.6878E-02	9.8979E-02
BI-207	A	1.8835E-02	1.8847E-02	4.9900E-02	4.9911E-02

BI-212		4.5798E-01	>12 Halflives	3.3036E-01	3.3137E-01
BI-214		4.3789E-01	>12 Halflives	1.2133E-01	1.2383E-01
RA-224		7.5363E-01	7.6143E+00	9.0845E+03	7.1199E+00
AC-228		6.1711E-01	>12 Halflives	1.5813E-01	1.6193E-01
TH-227	<	2.0973E-01	3.3142E-01		
TH-234	A	1.1304E+00	1.6061E+00	1.6822E+00	1.6845E+00
U-235	A	1.5888E-01	1.5888E-01	2.2884E-01	2.2901E-01
NP-237	<	9.7406E-01	9.7406E-01		
AM-241	<	1.7954E-01	1.7955E-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 2023.1 keV) 3.3453220E+02 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 3.4194131E+02 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_15DEC2004_1955.An1

Sample description
Detector 101 FSS-OOL-04-01-012-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\101F_15DEC2004_1955.An1

Acquisition information
Start time: 15-Dec-2004 19:45:41
Live time: 2000
Real time: 2003
Dead time: 0.15 %
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: YAEC_OperatingSpectrumRevA.Lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: wan32 G53W2.06
Start channel: 100 (50.23keV)
Stop channel: 4048 (2023.09keV)
Peak rejection level: 100.000%
Peak search sensitivity: 3
Sample Size: 1.8220E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8220E+03) =
5.4885E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	best method (based on spectrum).

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

Corrections	Status	Comments
Decay correct to date:	YES	06-Dec-2004 10:56:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

Energy Calibration
Normalized diff: 0.1580

********** 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	
167.72	84.10	324.	105.	0.052	78.63	1.011	TA-182	D
173.62	87.04	330.	137.	0.069	61.71	1.014	PB-214	D
179.16	89.81	320.	96.	0.048	84.46	1.016	PB-214	D
417.93	209.13	214.	110.	0.055	106.24	0.718	AC-228	s
539.73	270.00	115.	89.	0.045	94.08	1.068	AC-228	s
599.79	300.08	65.	69.	0.034	61.76	1.165	PB-212	D
656.45	328.34	85.	67.	0.034	107.56	0.813	RH-106M	s
892.11	446.11	28.	28.	0.014	105.13	1.387	AG-110M	M
972.78	486.43	23.	18.	0.009	140.26	1.194	LA-140	M

s - Peak fails shape tests.
D - Peak area deconvoluted.
M - Peak is close to a library peak.

This section based on library: YAEC_OperatingSpectrumRevA.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
AM-241	118.64	59.54	248.	55.	0.028	126.34	0.994D
TH-234	126.14	63.29	271.	85.	0.043	87.83	0.997D
TA-182	134.01	67.22	252.	64.	0.032	162.24	2.224s
HG-203	145.31	72.87	222.	0.	0.000	0.00	0.979D
PB-212	149.19	74.81	377.	239.	0.120	39.53	1.005D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-207	149.51	74.97	590.	26.	0.013	403.09	1.005D
PB-214	153.79	77.11	373.	417.	0.208	24.54	1.006D
PB-212	153.79	77.11	466.	0.	0.000	128.58	0.489D
CE-144	159.81	80.12	369.	0.	0.000	0.00	1.543D
EU-155	172.48	86.45	475.	0.	0.000	0.00	1.013D
NP-237	172.56	86.49	475.	0.	0.000	19230.13	1.013D
CD-109	175.66	88.04	452.	31.	0.015	295.92	1.014D
TH-234	184.34	92.38	519.	0.	0.000	0.00	1.017D
TH-234	185.18	92.80	335.	170.	0.085	51.25	1.018D
NP-237	191.32	95.87	291.	9.	0.005	803.61	1.020D
Cm-243	198.69	99.55	281.	14.	0.007	498.69	1.023D
Cm-243	207.11	103.76	337.	12.	0.006	632.21	1.026D
EU-155	210.21	105.31	296.	40.	0.020	190.19	1.027D
TE-132	225.81	113.10	228.	58.	0.029	168.71	1.857s
TE-132	232.20	116.30	232.	0.	0.000	0.00	1.611D
Cm-243	232.15	116.27	232.	88.	0.044	120.43	1.611s
EU-152	243.16	121.78	265.	19.	0.009	374.21	1.039D
CO-57	243.74	122.07	264.	20.	0.010	334.91	1.039D
EU-154	245.80	123.10	239.	13.	0.006	516.62	1.039D
CE-144	266.67	133.53	151.	6.	0.003	949.77	1.047D
CO-57	272.48	136.43	252.	23.	0.011	304.85	1.049D
U-235	287.14	143.76	219.	21.	0.010	307.25	1.054D
CE-141	290.52	145.45	260.	0.	0.000	0.00	1.055D
TE-131	299.07	149.72	232.	20.	0.010	333.12	1.059D
U-235	326.77	163.57	175.	31.	0.015	276.87	0.908s
CE-139	331.19	165.78	172.	0.	0.000	0.00	1.070
SB-125	352.02	176.19	164.	54.	0.027	157.98	1.630s
U-235	371.10	185.72	320.	0.	0.000	0.00	1.084A
RA-226	371.64	185.99	176.	155.	0.077	43.68	1.613A
U-235	410.66	205.50	131.	0.	0.000	0.00	1.098
TE-132	457.88	229.10	85.	34.	0.017	160.65	0.577s
TH-227	471.70	236.00	118.	30.	0.015	162.35	1.120D
PB-212	476.96	238.63	104.	836.	0.418	11.59	1.122D
RA-224	481.70	241.00	136.	71.	0.035	78.69	1.537A
PB-214	483.54	241.92	151.	75.	0.037	9.30	1.124A
SN-113	509.79	255.04	110.	0.	0.000	0.00	0.000D
TH-227	512.46	256.37	84.	35.	0.018	174.19	0.591s
Cm-243	554.93	277.60	71.	36.	0.018	110.66	1.149D
HG-203	558.07	279.17	109.	11.	0.005	281.99	1.150D
J-131	566.64	283.45	43.	6.	0.003	488.41	0.422s
PB-214	590.19	295.22	76.	152.	0.076	34.41	1.161D
CR-51	640.00	320.12	21.	0.	0.000	0.00	0.000s
AC-228	676.09	338.15	117.	163.	0.081	41.04	1.342s
EU-152	689.97	345.09	56.	4.	0.002	839.64	0.528s
PB-214	703.55	351.88	95.	270.	0.135	25.42	1.255
J-131	729.79	364.99	43.	17.	0.008	187.22	1.592s
SN-113	784.99	392.58	41.	53.	0.026	95.26	1.038s
SB-125	852.05	426.09	36.	15.	0.007	199.00	0.505s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Ag-108M	868.32	434.23	50.	12.	0.006	321.36	0.794s
TE-131	906.74	453.43	31.	10.	0.005	262.72	0.587s
SB-125	925.25	462.68	60.	43.	0.022	140.06	0.794s
TE-131	983.65	491.86	18.	7.	0.003	285.59	0.592s
TL-208	1021.38	510.72	54.	80.	0.040	51.67	1.310D
Kr-85	1027.92	513.99	57.	8.	0.004	413.06	1.313D
CS-134	1138.58	569.29	39.	6.	0.003	450.52	1.350D
BI-207	1139.34	569.67	48.	1.	0.001	2342.27	1.351D
TL-208	1166.17	583.08	68.	240.	0.120	26.94	1.244
SB-125	1201.57	600.77	34.	0.	0.000	0.00	0.654D
CS-134	1209.35	604.66	44.	14.	0.007	222.01	1.374D
BI-214	1218.68	609.32	31.	226.	0.113	22.51	1.378D
Ag-108M	1228.78	614.37	20.	0.	0.000	0.00	0.418D
SB-125	1272.24	636.09	25.	0.	0.000	0.00	1.396
J-131	1273.61	636.77	14.	4.	0.002	427.26	0.518s
AG-110M	1315.58	657.75	17.	8.	0.004	235.78	1.410D
CS-137	1323.33	661.62	17.	10.	0.005	204.46	1.413D
NB-94	1403.56	701.72	21.	8.	0.004	274.29	0.623s
Ag-108M	1446.05	722.95	19.	0.	0.000	3892.21	1.454D
EU-154	1446.75	723.30	29.	0.	0.000	0.00	1.454D
BI-212	1454.49	727.17	38.	41.	0.020	79.47	1.457D
EU-152	1552.48	776.14	16.	14.	0.007	161.92	0.523s
BI-212	1571.41	785.60	26.	23.	0.012	134.16	1.027
CS-134	1591.75	795.76	33.	19.	0.010	142.61	1.502D
CS-134	1603.91	801.84	21.	1.	0.000	2727.36	1.506D
CO-58	1622.00	810.88	14.	0.	0.000	0.00	0.000s
MN-54	1670.74	835.23	28.	14.	0.007	198.90	1.442s
MN-56	1691.83	845.78	12.	6.	0.003	300.00	0.480s
NB-94	1748.69	874.19	25.	3.	0.002	834.67	0.463s
AG-110M	1767.00	883.34	12.	2.	0.001	821.58	0.466s
Y-88	1796.14	897.90	17.	6.	0.003	285.36	2.469s
AC-228	1821.49	910.57	37.	140.	0.070	34.91	2.000s
AG-110M	1875.00	937.31	3.	0.	0.000	0.00	0.000s
EU-152	1928.41	964.00	31.	23.	0.012	119.44	1.612D
AC-228	1938.21	968.90	30.	84.	0.042	42.97	1.616D
EU-154	2008.88	1004.21	9.	8.	0.004	191.21	1.047s
BI-207	2129.56	1064.52	8.	2.	0.001	781.02	0.572s
FE-59	2201.86	1100.65	9.	10.	0.005	174.03	0.698s
EU-152	2224.72	1112.07	29.	7.	0.003	354.80	1.708D
ZN-65	2231.62	1115.52	27.	12.	0.006	194.92	1.710D
BI-214	2241.15	1120.28	32.	26.	0.013	109.51	1.713D
TA-182	2243.15	1121.28	39.	0.	0.000	0.00	0.000D
TE-131	2296.00	1147.69	15.	4.	0.002	483.15	0.000s
CO-60	2345.83	1172.59	23.	0.	0.000	0.00	0.944s
TA-182	2381.90	1190.61	21.	7.	0.003	338.08	0.447s
TA-182	2445.96	1222.63	15.	9.	0.005	212.13	1.574
EU-154	2549.61	1274.42	9.	14.	0.007	136.83	1.025s
FE-59	2584.00	1291.60	2.	0.	0.000	0.00	0.000s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CO-60	2664.16	1331.66	16.	14.	0.007	104.45	0.876s
AG-110M	2768.00	1383.54	0.	0.	0.000	0.00	0.000s
EU-152	2818.24	1408.64	7.	10.	0.005	153.93	0.630s
K-40	2921.89	1460.44	19.	605.	0.303	12.97	1.827
BI-212	3239.42	1619.09	0.	12.	0.006	86.60	1.499
BI-214	3529.75	1764.16	0.	24.	0.012	61.24	1.699
MN-56	3625.00	1811.75	0.	5.	0.002	134.16	0.500s
Y-88	3675.00	1836.73	0.	1.	0.000	300.00	0.500s

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 microCi	Peak Energy keV	Peak Activity microCi	Code	MDA Value microCi	Comments
K-40		2.5967E-02	1460.75	2.597E-02	(	9.882E-04	G
CR-51		0.0000E+00	320.07	0.000E+00	?	2.763E-04	G
MN-54		4.0786E-05	834.81	4.079E-05	(	7.636E-05	G
MN-56		0.0000E+00	846.60	0.000E+00	&	5.423E-05	G
			1811.20	1.026E-04	?	1.512E-04	G
FE-59		6.1285E-05	1099.22	6.128E-05	&(	1.074E-04	G
			1291.56	0.000E+00	?	8.874E-05	G
CO-57		0.0000E+00	122.07	0.000E+00	} P	5.858E-05	G
			136.43	0.000E+00	%	4.671E-04	G
CO-58		0.0000E+00	810.75	0.000E+00	%	5.578E-05	G
CO-60		6.0134E-05	1332.51	6.013E-05	(P	8.998E-05	G
			1173.23	0.000E+00	? P	9.556E-05	G
Cm-243		2.5590E-04	277.60	2.559E-04	(	2.968E-04	G
			117.00	5.211E-04	}	4.363E-04	G
			103.76	0.000E+00	%	2.504E-04	G
			99.55	0.000E+00	%	3.735E-04	G
ZN-65		8.9080E-05	1115.52	8.908E-05	(	1.910E-04	G
Kr-85		0.0000E+00	513.99	0.000E+00	%	1.578E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Y-88	0.0000E+00	1836.01	0.000E+00	% P	4.191E-05		G
		898.02	0.000E+00	% P	6.962E-05		G
NB-94	0.0000E+00	871.10	0.000E+00	&	7.597E-05		G
		702.50	1.924E-05	&	5.789E-05		G
Ag-108M	0.0000E+00	722.95	0.000E+00	}	6.300E-05		G
		614.37	0.000E+00	&	5.513E-05		G
		433.93	0.000E+00	%	5.997E-05		G
AG-110M	1.9649E-05	657.75	1.965E-05	(	5.208E-05		G
		884.67	0.000E+00	&	7.662E-05		G
		937.48	0.000E+00	?	9.794E-05		G
		1384.27	0.000E+00	?	1.326E-04		G
CD-109	5.7198E-04	88.04	5.720E-04	(	1.878E-03		G
SN-113	1.1300E-04	391.71	1.130E-04	&(P	6.982E-05		G
		255.04	0.000E+00	&	2.283E-03		G
SB-125	2.8301E-04	427.95	7.592E-05	&(	1.552E-04		G
		600.77	0.000E+00	&	3.370E-04		G
		636.15	0.000E+00	}	5.096E-04		G
		463.51	6.966E-04	&(	6.287E-04		G
		176.29	5.995E-04	*(	7.001E-04		G
TE-131	0.0000E+00	149.72	0.000E+00	%	7.054E-05		G
		452.32	8.971E-05	&	2.476E-04		G
		1146.96	0.000E+00	%	1.555E-03		G
		492.66	2.370E-04	&	8.055E-04		G
TE-132	7.3111E-05	228.16	3.216E-05	&(	4.320E-05		G
		116.30	0.000E+00	}	2.418E-03		G
		111.76	2.032E-03	&(	2.536E-03		G
J-131	2.6517E-05	364.48	2.652E-05	(	5.250E-05		G
		636.97	0.000E+00	}	6.121E-04		G
		284.29	0.000E+00	&	5.567E-04		G
CS-134	4.4119E-05	604.66	2.930E-05	(	7.232E-05		G
		795.76	6.105E-05	(	9.254E-05		G
		569.29	0.000E+00	}	4.069E-04		G
		801.84	0.000E+00	%	7.521E-04		G
CS-137	2.6249E-05	661.62	2.625E-05	(	5.933E-05		G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-139	0.0000E+00	165.85	0.000E+00	P	5.471E-05		G
CE-141	0.0000E+00	145.45	0.000E+00	%	1.061E-04		G
CE-144	0.0000E+00	133.53	0.000E+00	%	3.576E-04		G
		80.12	0.000E+00	!	4.343E-03		G
EU-152	0.0000E+00	121.78	0.000E+00	}	1.718E-04		G
		344.30	0.000E+00	&	1.685E-04		G
		1408.08	2.166E-04	?	3.090E-04		G
		964.00	5.069E-04		6.265E-04		G
		1112.07	0.000E+00	%	7.429E-04		G
		778.90	2.950E-04	&	4.402E-04		G
EU-154	0.0000E+00	123.10	0.000E+00	%	1.181E-04		G
		1274.80	1.588E-04		1.931E-04		G
		723.30	0.000E+00	}	3.487E-04		G
		1004.80	1.506E-04	?	3.141E-04		G
EU-155	1.1821E-04	86.45	0.000E+00	}	2.254E-04		G
		105.31	1.182E-04	$(	2.471E-04		G
TA-182	1.4497E-04	67.75	1.524E-04	&(	1.826E-04		G
		1121.28	0.000E+00	%	3.312E-04		G
		1221.42	1.337E-04	&(	2.945E-04		G
		1189.05	0.000E+00	&	5.650E-04		G
HG-203	0.0000E+00	279.17	0.000E+00	% P	6.267E-05		G
		72.87	0.000E+00	!	9.583E-04		G
TL-208	5.7853E-04	583.14	5.650E-04	(	9.648E-05		G
		510.72	6.304E-04	(	2.932E-04		G
PB-212	1.6837E-03	238.63	1.684E-03	(	1.009E-04		G
		77.11	0.000E+00	}	4.637E-04		Energy duplication
		74.81	2.035E-03	}	7.930E-04		G
PB-214	8.7620E-04	351.99	9.002E-04	(	1.605E-04		G
		295.22	8.298E-04	(	2.367E-04		G
		77.11	3.061E-03	}	6.806E-04		Energy duplication
		241.92	8.762E-04	}	7.042E-04		G
BI-207	0.0000E+00	569.67	0.000E+00	}	7.043E-05		G
		1063.62	0.000E+00	&	6.994E-05		G
		74.97	0.000E+00	}	2.446E-04		G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-212	8.5964E-04	727.17	8.596E-04	(	6.626E-04		G
		1620.56	2.199E-03	&	1.350E-03		G
		785.42	3.106E-03	+	3.504E-03		G
BI-214	1.0320E-03	609.32	1.032E-03	(	1.301E-04		G
		1764.51	8.210E-04	-	2.521E-04		G
		1120.28	6.293E-04	-	7.040E-04		G
RA-224	1.5827E-03	241.00	1.583E-03	}(	2.176E-03		G
RA-226	3.4275E-03	185.99	3.428E-03	}(	1.524E-03		G
AC-228	1.5172E-03	911.07	1.464E-03	*(	3.268E-04		G
		968.90	1.540E-03	(	5.201E-04		G
		338.40	1.613E-03	@(	5.273E-04		G
TH-227	3.2305E-04	236.00	2.313E-04	(	4.092E-04		G
		256.25	4.741E-04	(	6.152E-04		G
TH-234	2.6467E-03	63.29	2.647E-03	(	2.456E-03		G
		92.80	3.842E-03	}	1.993E-03		G
		92.38	0.000E+00	}	2.884E-03		G
U-235	0.0000E+00	185.72	0.000E+00	}	1.158E-04		G
		143.76	0.000E+00	%	4.453E-04		G
		205.31	0.000E+00	%	9.226E-04		G
		163.35	4.492E-04	*	9.324E-04		G
NP-237	0.0000E+00	86.49	0.000E+00	}	5.628E-04		G
		95.87	0.000E+00	%	1.858E-03		G
AM-241	2.4155E-04	59.54	2.415E-04	(P	3.312E-04		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
K-40		1.4252E+01	1.4252E+01	1.8485E+00	2.0163E+00
CR-51	<	1.5165E-01	1.9171E-01		
MN-54	#A	2.2385E-02	2.2856E-02	4.5460E-02	4.5478E-02
MN-56	<	2.98E-02	>12 Halflives		
FE-59	#A	3.3636E-02	3.8845E-02	6.7600E-02	6.7636E-02
CO-57	<	2.5637E-01	2.6261E-01		
CO-58	<	3.0616E-02	3.3557E-02		
CO-60	A	3.3004E-02	3.3116E-02	5.0367E-02	5.0401E-02
Cm-243	A	1.4045E-01	1.4053E-01	1.5552E-01	1.5572E-01
ZN-65	A	4.8891E-02	5.0211E-02	9.7869E-02	9.7910E-02
Kr-85	<	8.6624E+02	8.6630E+02		
Y-88	<	2.3004E-02	2.4449E-02		
NB-94	<	4.1696E-02	4.1696E-02		
Ag-108M	<	3.0256E-02	3.0260E-02		
AG-110M	A	1.0784E-02	1.1068E-02	2.6097E-02	2.6104E-02
CD-109	A	3.1393E-01	3.1846E-01	9.4241E-01	9.4257E-01
SN-113	#	6.2021E-02	6.5620E-02	6.3929E-02	6.4036E-02
SB-125	#	1.5533E-01	1.5633E-01	1.5119E-01	1.5144E-01
TE-131	<	3.87E-02	>12 Halflives		
TE-132		4.0127E-02	2.9662E-01	3.4550E-01	3.4591E-01
J-131	A	1.4554E-02	3.2638E-02	6.1106E-02	6.1133E-02
CS-134	A	2.4214E-02	2.4424E-02	3.2224E-02	3.2254E-02
CS-137	A	1.4407E-02	1.4415E-02	2.9474E-02	2.9485E-02
CE-139	<	3.0027E-02	3.1479E-02		
CE-141	<	5.8237E-02	7.1169E-02		
CE-144	<	1.9627E-01	2.0080E-01		
EU-152	<	9.2495E-02	9.2625E-02		
EU-154	<	6.4812E-02	6.4948E-02		
EU-155	A	6.4880E-02	6.5113E-02	1.2384E-01	1.2389E-01
TA-182	A	7.9568E-02	8.4190E-02	1.1242E-01	1.1252E-01

HG-203	<	3.4394E-02	3.9538E-02

TL-208		3.1752E-01	>12 Halflives	8.5551E-02	8.7412E-02
PB-212		9.2412E-01	>12 Halflives	1.0707E-01	1.1913E-01
PB-214		4.8090E-01	>12 Halflives	1.0286E-01	1.0638E-01
BI-207	<	3.8386E-02	3.8404E-02		
BI-212		4.7181E-01	>12 Halflives	3.7496E-01	3.7591E-01
BI-214		5.6642E-01	>12 Halflives	1.2749E-01	1.3145E-01
RA-224	#	8.6865E-01	5.1208E+00	5.0777E+03	4.0398E+00
RA-226	#	1.8812E+00	1.8812E+00	9.6861E+02	8.2851E-01
AC-228		8.3268E-01	>12 Halflives	1.9128E-01	1.9698E-01
TH-227	A	1.7730E-01	2.5185E-01	2.9985E-01	3.0019E-01
TH-234		1.4526E+00	1.9018E+00	1.6702E+00	1.6736E+00
U-235	<	2.4441E-01	2.4441E-01		
NP-237	<	1.0200E+00	1.0200E+00		
AM-241	A	1.3257E-01	1.3258E-01	1.6828E-01	1.6844E-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 2023.1 keV) 1.9822664E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 2.4894791E+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_16DEC2004_1525.An1

Sample description
Detector 101 FSS_OOL-04-01-024-FB-S WET

Spectrum Filename: C:\GammaVision\Spectra\101F_16DEC2004_1525.An1

Acquisition information
Start time: 16-Dec-2004 15:18:34
Live time: 2000
Real time: 2001
Dead time: 0.07 %
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: YAEC_OperatingSpectrumRevA.Lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: wan32 G53W2.06
Start channel: 100 (50.23keV)
Stop channel: 4048 (2023.09keV)
Peak rejection level: 100.000%
Peak search sensitivity: 3
Sample Size: 1.6380E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6380E+03) =
6.1050E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	best method (based on spectrum).

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

Corrections	Status	Comments
Decay correct to date:	YES	06-Dec-2004 11:55:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

Energy Calibration
Normalized diff: 0.1635

********** 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	
179.87	90.05	166.	70.	0.035	86.01	1.016	PB-214	D
257.64	129.02	140.	100.	0.050	91.98	1.103	AC-228	s
778.29	389.08	30.	19.	0.010	138.37	1.227	RH-106M	D

s - Peak fails shape tests.
D - Peak area deconvoluted.

This section based on library: YAEC_OperatingSpectrumRevA.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
AM-241	118.64	59.54	177.	16.	0.008	364.78	0.994D
TH-234	126.14	63.29	132.	66.	0.033	83.13	0.996D
TA-182	132.82	66.63	220.	20.	0.010	540.05	0.793s
HG-203	145.31	72.87	112.	0.	0.000	0.00	1.096D
PB-212	149.19	74.81	209.	127.	0.063	55.27	1.005D
BI-207	149.51	74.97	195.	0.	0.000	0.00	0.606D
PB-214	153.79	77.11	208.	202.	0.101	36.93	1.006D
PB-212	153.79	77.11	262.	0.	0.000	178.09	0.538D
CE-144	159.81	80.12	131.	0.	0.000	0.00	0.391D
EU-155	172.48	86.45	238.	0.	0.000	0.00	1.013D
NP-237	172.56	86.49	178.	60.	0.030	102.62	1.013D
CD-109	175.66	88.04	216.	14.	0.007	453.76	1.014D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TH-234	184.34	92.38	260.	19.	0.009	373.01	1.018D
TH-234	185.18	92.80	194.	80.	0.040	81.17	1.018D
NP-237	191.32	95.87	147.	0.	0.000	0.00	1.020D
Cm-243	198.69	99.55	192.	0.	0.000	0.00	0.700D
Cm-243	207.11	103.76	60.	0.	0.000	0.00	0.363D
EU-155	210.21	105.31	120.	25.	0.013	194.76	1.027D
TE-132	226.54	113.47	126.	32.	0.016	229.45	0.551s
TE-132	232.95	116.67	160.	50.	0.025	190.68	0.980s
Cm-243	233.60	117.00	99.	0.	0.000	0.00	0.608D
EU-152	243.16	121.78	144.	7.	0.004	728.27	1.039D
CO-57	243.74	122.07	152.	0.	0.000	0.00	1.039D
EU-154	245.80	123.10	125.	20.	0.010	250.51	1.040D
CE-144	265.11	132.75	104.	66.	0.033	110.03	2.514s
CO-57	272.48	136.43	75.	0.	0.000	0.00	1.499D
U-235	287.14	143.76	111.	16.	0.008	296.61	1.054D
CE-141	290.52	145.45	130.	13.	0.007	367.42	1.055D
TE-131	299.07	149.72	158.	8.	0.004	705.97	1.058D
U-235	326.34	163.35	89.	17.	0.008	252.90	1.068D
CE-139	331.34	165.85	105.	11.	0.005	414.67	1.070D
SB-125	350.73	175.54	99.	5.	0.002	854.87	0.862
U-235	371.10	185.72	199.	105.	0.053	9.70	1.084A
RA-226	371.64	185.99	91.	0.	0.000	4047.22	1.529A
U-235	412.00	206.16	44.	1.	0.001	2586.50	0.000s
TE-132	454.92	227.61	77.	20.	0.010	287.16	1.370s
TH-227	471.70	236.00	105.	29.	0.014	162.36	1.120D
PB-212	476.96	238.63	75.	342.	0.171	19.49	1.121D
RA-224	481.70	241.00	105.	28.	0.014	165.54	1.606A
PB-214	483.54	241.92	92.	53.	0.027	10.67	1.124A
SN-113	509.79	255.04	71.	0.	0.000	0.00	0.548D
TH-227	511.98	256.14	70.	42.	0.021	153.53	0.716s
Cm-243	554.93	277.60	46.	20.	0.010	161.37	1.149D
HG-203	558.07	279.17	61.	0.	0.000	0.00	1.150D
J-131	567.00	283.63	24.	0.	0.000	0.00	0.000s
PB-214	590.44	295.35	58.	124.	0.062	40.54	1.018
CR-51	640.56	320.39	22.	3.	0.002	830.66	1.050
AC-228	676.49	338.35	33.	54.	0.027	64.09	1.238
EU-152	689.07	344.64	19.	10.	0.005	207.85	0.970
PB-214	703.84	352.02	37.	180.	0.090	27.74	1.083
J-131	726.75	363.47	33.	12.	0.006	257.86	0.525s
SN-113	783.25	391.71	30.	0.	0.000	0.00	1.229D
SB-125	852.99	426.56	47.	21.	0.011	187.03	0.535s
Ag-108M	867.10	433.62	32.	8.	0.004	346.76	0.625s
TE-131	905.74	452.93	39.	21.	0.010	171.73	0.779s
SB-125	925.42	462.76	41.	30.	0.015	127.28	0.950s
TE-131	982.51	491.29	19.	6.	0.003	334.57	0.407s
TL-208	1021.38	510.72	32.	44.	0.022	71.45	1.311D
Kr-85	1027.92	513.99	36.	9.	0.004	314.79	1.313D
CS-134	1135.43	567.72	17.	9.	0.004	242.58	0.938

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-207	1139.34	569.67	20.	0.	0.000	0.00	1.351
TL-208	1166.47	583.23	25.	101.	0.051	38.46	1.193
SB-125	1201.57	600.77	9.	0.	0.000	0.00	1.372D
CS-134	1209.35	604.66	17.	3.	0.001	648.09	1.374D
BI-214	1218.68	609.32	12.	144.	0.072	27.03	1.378D
Ag-108M	1228.78	614.37	12.	0.	0.000	0.00	1.004D
SB-125	1272.36	636.15	9.	0.	0.000	0.00	0.000D
J-131	1274.81	637.37	16.	16.	0.008	150.00	0.826s
AG-110M	1315.58	657.75	14.	5.	0.003	329.17	1.410D
CS-137	1323.33	661.62	18.	18.	0.009	119.43	1.413D
NB-94	1407.52	703.70	16.	2.	0.001	793.73	0.693s
Ag-108M	1446.05	722.95	16.	0.	0.000	0.00	1.454D
EU-154	1446.75	723.30	15.	3.	0.002	536.18	1.454D
BI-212	1454.49	727.17	15.	25.	0.012	90.57	1.457D
EU-152	1552.42	776.11	16.	11.	0.005	209.49	0.480s
BI-212	1573.33	786.56	12.	7.	0.004	260.69	0.664s
CS-134	1591.75	795.76	16.	24.	0.012	93.80	1.502D
CS-134	1603.91	801.84	10.	3.	0.001	547.45	1.506D
CO-58	1620.00	809.88	3.	2.	0.001	483.74	0.158s
MN-54	1670.38	835.06	5.	2.	0.001	408.83	0.395s
MN-56	1691.53	845.63	5.	2.	0.001	584.81	0.394s
NB-94	1743.00	871.35	5.	1.	0.001	679.15	0.000s
AG-110M	1768.89	884.28	3.	6.	0.003	173.21	0.661s
Y-88	1796.67	898.17	8.	1.	0.001	600.00	0.699s
AC-228	1822.76	911.21	16.	54.	0.027	58.12	1.529
AG-110M	1874.00	936.81	1.	0.	0.000	0.00	0.167s
EU-152	1928.41	964.00	14.	19.	0.010	105.96	1.613D
AC-228	1938.21	968.90	17.	27.	0.014	85.77	1.616D
EU-154	2010.00	1004.77	3.	0.	0.000	0.00	0.000s
BI-207	2125.23	1062.35	7.	19.	0.009	102.73	1.135s
FE-59	2198.50	1098.97	5.	12.	0.006	125.83	1.280
EU-152	2224.72	1112.07	9.	5.	0.002	319.50	1.708D
ZN-65	2231.62	1115.52	21.	10.	0.005	226.06	1.710D
BI-214	2241.15	1120.28	13.	30.	0.015	73.59	1.713D
TA-182	2243.15	1121.28	22.	0.	0.000	0.00	0.775D
TE-131	2296.69	1148.03	8.	17.	0.009	113.00	0.642s
CO-60	2347.27	1173.31	22.	13.	0.007	127.72	0.941s
TA-182	2377.75	1188.54	19.	23.	0.012	131.84	0.571s
TA-182	2444.20	1221.74	7.	5.	0.002	269.44	0.999s
EU-154	2548.07	1273.65	9.	9.	0.005	194.93	0.783s
FE-59	2583.20	1291.20	3.	2.	0.001	502.00	0.475s
CO-60	2666.00	1332.57	10.	0.	0.000	0.00	0.000s
AG-110M	2768.33	1383.71	1.	0.	0.000	360.56	0.394s
EU-152	2815.33	1407.19	0.	4.	0.002	150.00	0.750s
K-40	2922.23	1460.61	5.	326.	0.163	17.06	1.927
BI-212	3241.88	1620.32	2.	4.	0.002	205.11	0.944s
BI-214	3529.59	1764.08	0.	17.	0.009	72.76	0.874s
MN-56	3622.00	1810.25	0.	0.	0.000	0.00	0.000s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Y-88	3672.00	1835.23	1.	0.	0.000	335.41	0.200s

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 microCi	Peak Energy keV	Peak Activity microCi	Peak Code	Peak MDA Value microCi	Comments
K-40		1.3992E-02	1460.75	1.399E-02	(	5.636E-04	G
CR-51		0.0000E+00	320.07	0.000E+00	%	2.821E-04	G
MN-54		0.0000E+00	834.81	0.000E+00	%	3.594E-05	G
MN-56		0.0000E+00	846.60	0.000E+00	&	3.875E-05	G
			1811.20	0.000E+00	?	1.512E-04	G
FE-59		7.6078E-05	1099.22	7.608E-05	?(	8.324E-05	G
			1291.56	0.000E+00	%	1.070E-04	G
CO-57		0.0000E+00	122.07	0.000E+00	} P	4.495E-05	G
			136.43	0.000E+00	!	2.621E-04	G
CO-58		0.0000E+00	810.75	0.000E+00	&	3.090E-05	G
CO-60		0.0000E+00	1332.51	0.000E+00	? P	7.538E-05	G
			1173.23	4.972E-05	? P	9.308E-05	G
Cm-243		1.3945E-04	277.60	1.395E-04	(	2.436E-04	G
			117.00	0.000E+00	}	2.906E-04	G
			103.76	0.000E+00	&	1.106E-04	G
			99.55	0.000E+00	!	3.113E-04	G
ZN-65		6.8675E-05	1115.52	6.868E-05	(	1.735E-04	G
Kr-85		0.0000E+00	513.99	0.000E+00	%	1.284E+00	G
Y-88		0.0000E+00	1836.01	0.000E+00	% P	4.191E-05	G
			898.02	0.000E+00	% P	5.020E-05	G
NB-94		0.0000E+00	871.10	0.000E+00	%	3.732E-05	G
			702.50	0.000E+00	&	5.205E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
Ag-108M	0.0000E+00	722.95	0.000E+00	}	5.826E-05	G
		614.37	0.000E+00	!	4.429E-05	G
		433.93	0.000E+00	%	4.889E-05	G
AG-110M	0.0000E+00	657.75	0.000E+00	%	4.781E-05	G
		884.67	2.438E-05	?	4.382E-05	G
		937.48	0.000E+00	?	6.695E-05	G
		1384.27	0.000E+00	%	1.326E-04	G
CD-109	0.0000E+00	88.04	0.000E+00	%	1.314E-03	G
SN-113	0.0000E+00	391.71	0.000E+00	% P	6.034E-05	G
		255.04	0.000E+00	&	1.862E-03	G
SB-125	2.0275E-04	427.95	1.080E-04	&(	1.748E-04	G
		600.77	0.000E+00	!	1.920E-04	G
		636.15	0.000E+00	}	3.295E-04	G
		463.51	4.833E-04	&(	5.283E-04	G
		176.29	0.000E+00	&	5.500E-04	G
TE-131	0.0000E+00	149.72	0.000E+00	%	5.874E-05	G
		452.32	1.823E-04	*	2.762E-04	G
		1146.96	1.274E-03	&	1.191E-03	G
		492.66	0.000E+00	&	8.119E-04	G
TE-132	4.1291E-05	228.16	1.892E-05	*(	4.124E-05	G
		116.30	1.641E-03	}	2.024E-03	G
		111.76	1.112E-03	&(	1.911E-03	G
J-131	1.8378E-05	364.48	1.838E-05	&(	4.665E-05	G
		636.97	4.836E-04	}	6.453E-04	G
		284.29	0.000E+00	&	4.259E-04	G
CS-134	0.0000E+00	604.66	0.000E+00	%	4.721E-05	G
		795.76	7.554E-05		6.745E-05	G
		569.29	1.110E-04	}	2.832E-04	G
		801.84	0.000E+00	%	5.501E-04	G
CS-137	4.9468E-05	661.62	4.947E-05	(	5.988E-05	G
CE-139	0.0000E+00	165.85	0.000E+00	% P	4.331E-05	G
CE-141	0.0000E+00	145.45	0.000E+00	%	7.598E-05	G
CE-144	3.9297E-04	133.53	3.930E-04	&(	2.991E-04	G
		80.12	0.000E+00	?	2.638E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-152	1.5932E-04	121.78	0.000E+00	}		1.281E-04	G
		344.30	4.484E-05	(		1.032E-04	G
		1408.08	8.385E-05	?(		1.545E-04	G
		964.00	4.237E-04	$(		4.367E-04	G
		1112.07	0.000E+00	%		4.540E-04	G
		778.90	2.238E-04	&(		4.343E-04	G
EU-154	6.6635E-05	123.10	3.110E-05	(		8.667E-05	G
		1274.80	1.071E-04	&(		1.886E-04	G
		723.30	0.000E+00	}		2.588E-04	G
		1004.80	0.000E+00	?		2.029E-04	G
EU-155	7.4838E-05	86.45	0.000E+00	}		1.613E-04	G
		105.31	7.484E-05	(		1.604E-04	G
TA-182	0.0000E+00	67.75	0.000E+00	&		1.713E-04	G
		1121.28	0.000E+00	%		2.541E-04	G
		1221.42	7.164E-05	?		2.155E-04	G
		1189.05	5.362E-04			5.368E-04	G
HG-203	0.0000E+00	279.17	0.000E+00	%	P	4.776E-05	G
		72.87	0.000E+00	!		6.911E-04	G
TL-208	2.3742E-04	583.14	2.374E-04	(		6.114E-05	G
		510.72	3.457E-04	+		2.310E-04	G
PB-212	6.8776E-04	238.63	6.878E-04	(		8.690E-05	G
		77.11	0.000E+00	}		3.511E-04	Energy duplication
		74.81	1.079E-03	}		5.968E-04	G
PB-214	6.2596E-04	351.99	6.013E-04	(		1.031E-04	G
		295.22	6.737E-04	(		2.086E-04	G
		77.11	1.483E-03	}		5.133E-04	Energy duplication
		241.92	6.260E-04	}		5.561E-04	G
BI-207	8.5888E-05	569.67	0.000E+00	}		4.751E-05	G
		1063.62	8.589E-05	&(		6.798E-05	G
		74.97	0.000E+00	}		1.430E-04	G
BI-212	6.1426E-04	727.17	5.185E-04	(		4.412E-04	G
		1620.56	7.940E-04	?(		1.599E-03	G
		785.42	9.319E-04	&(		2.510E-03	G
BI-214	6.5820E-04	609.32	6.593E-04	(		8.709E-05	G
		1764.51	5.815E-04	?(		2.521E-04	G
		1120.28	7.361E-04	(		4.661E-04	G

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
RA-224	6.2699E-04	241.00	6.270E-04	}(	1.574E-03	G
RA-226	0.0000E+00	185.99	0.000E+00	}	1.046E-03	G
AC-228	5.3781E-04	911.07	5.624E-04	(	2.258E-04	G
		968.90	5.009E-04	(	4.001E-04	G
		338.40	5.320E-04	(	2.936E-04	G
TH-227	3.5150E-04	236.00	2.195E-04	(	3.881E-04	G
		256.25	5.689E-04	@(	5.648E-04	G
TH-234	2.0305E-03	63.29	2.031E-03	(	1.744E-03	G
		92.80	1.810E-03	}	1.531E-03	G
		92.38	0.000E+00	}	2.063E-03	G
U-235	1.4130E-04	185.72	1.413E-04	}	9.210E-05	G
		143.76	9.701E-05	$(	3.224E-04	G
		205.31	0.000E+00	&	5.540E-04	G
		163.35	2.403E-04	$(	6.777E-04	G
NP-237	0.0000E+00	86.49	3.221E-04	}	3.507E-04	G
		95.87	0.000E+00	!	1.339E-03	G
AM-241	0.0000E+00	59.54	0.000E+00	% P	2.822E-04	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
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** 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
K-40		8.5424E+00	8.5424E+00	1.4569E+00	1.5348E+00
CR-51	<	1.7221E-01	2.2195E-01		
MN-54	<	2.1941E-02	2.2440E-02		
MN-56	<	2.37E-02	>12 Halflives		
FE-59	#A	4.6445E-02	5.4279E-02	6.8300E-02	6.8369E-02
CO-57	<	1.6003E-01	1.6425E-01		
CO-58	<	1.8866E-02	2.0836E-02		
CO-60	<	4.6017E-02	4.6185E-02		
Cm-243	A	8.5136E-02	8.5188E-02	1.3746E-01	1.3755E-01
ZN-65	A	4.1926E-02	4.3153E-02	9.7549E-02	9.7579E-02
Kr-85	<	7.8399E+02	7.8405E+02		
Y-88	<	2.5589E-02	2.7333E-02		
NB-94	<	2.2783E-02	2.2783E-02		
Ag-108M	<	2.7041E-02	2.7045E-02		
AG-110M	<	2.9187E-02	3.0020E-02		
CD-109	<	8.0209E-01	8.1463E-01		
SN-113	<	3.6837E-02	3.9157E-02		
SB-125	#	1.2378E-01	1.2464E-01	1.4099E-01	1.4116E-01
TE-131	<	3.59E-02	>12 Halflives		
TE-132	#C	2.5208E-02	2.1981E-01	4.0398E-01	4.0417E-01
J-131	A	1.1220E-02	2.6896E-02	6.9354E-02	6.9371E-02
CS-134	<	2.8821E-02	2.9092E-02		
CS-137	A	3.0200E-02	3.0220E-02	3.6091E-02	3.6131E-02
CE-139	<	2.6441E-02	2.7828E-02		
CE-141	<	4.6385E-02	5.7631E-02		
CE-144	#	2.3991E-01	2.4592E-01	2.7059E-01	2.7094E-01
EU-152	C	9.7264E-02	9.7411E-02	8.4645E-02	8.4824E-02
EU-154	A	4.0681E-02	4.0773E-02	6.4710E-02	6.4750E-02
EU-155	A	4.5689E-02	4.5867E-02	8.9330E-02	8.9366E-02
TA-182	<	1.0456E-01	1.1115E-01		
HG-203	<	2.9155E-02	3.3903E-02		
TL-208		1.4495E-01	>12 Halflives	5.5749E-02	5.6347E-02
PB-212		4.1988E-01	>12 Halflives	8.1814E-02	8.5184E-02
PB-214		3.8215E-01	>12 Halflives	9.3857E-02	9.6309E-02
BI-207	#C	5.2435E-02	5.2461E-02	5.3895E-02	5.3977E-02
BI-212		3.7501E-01	>12 Halflives	3.3964E-01	3.4030E-01
BI-214		4.0183E-01	>12 Halflives	1.0861E-01	1.1096E-01
RA-224		3.8278E-01	2.6125E+00	5.7458E+03	4.3274E+00
AC-228		3.2833E-01	>12 Halflives	1.3333E-01	1.3462E-01

TH-227	A	2.1459E-01	3.1379E-01	3.5059E-01	3.5104E-01
TH-234		1.2396E+00	1.6595E+00	1.3796E+00	1.3826E+00
U-235	A	8.6266E-02	8.6266E-02	1.6813E-01	1.6820E-01
NP-237	<	8.1755E-01	8.1755E-01		
AM-241	<	1.7230E-01	1.7231E-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 2023.1 keV) 1.1305520E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 1.4281017E+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_16DEC2004_1605.An1

Sample description
Detector 101 FSS_OOL-04-01-023-FB-S WET

Spectrum Filename: C:\GammaVision\Spectra\101F_16DEC2004_1605.An1

Acquisition information
Start time: 16-Dec-2004 15:59:28
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: YAEC_OperatingSpectrumRevA.Lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: wan32 G53W2.06
Start channel: 100 (50.23keV)
Stop channel: 4048 (2023.09keV)
Peak rejection level: 100.000%
Peak search sensitivity: 3
Sample Size: 2.2870E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.2870E+03) =
4.3725E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	best method (based on spectrum).

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

Corrections	Status	Comments
Decay correct to date:	YES	06-Dec-2004 13:21:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

Energy Calibration
Normalized diff: 0.1044

********** 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	
174.17	87.30	374.	182.	0.091	71.04	1.096	PB-214	s
257.27	128.83	222.	102.	0.051	92.54	1.519	AC-228	s
308.95	154.66	279.	93.	0.047	130.14	1.160	XE-138	s
418.50	209.68	178.	100.	0.050	63.87	1.101	NP-239	D
540.85	270.56	84.	104.	0.052	66.03	1.476	AC-228	s
600.05	300.03	67.	57.	0.029	72.41	1.165	PB-212	D
818.69	409.42	39.	29.	0.014	140.70	0.658	AC-228	s
925.32	462.68	56.	41.	0.020	91.04	1.278	CS-138	D
1536.04	767.92	40.	37.	0.019	101.59	1.415	BI-214	M

s - Peak fails shape tests.
D - Peak area deconvoluted.
M - Peak is close to a library peak.

This section based on library: YAEC_OperatingSpectrumRevA.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
AM-241	118.64	59.54	242.	26.	0.013	256.85	0.994D
TH-234	126.14	63.29	329.	53.	0.026	151.05	0.996D
TA-182	135.49	67.96	630.	116.	0.058	180.78	1.534s
HG-203	145.31	72.87	396.	42.	0.021	206.12	1.003D
PB-212	149.19	74.81	375.	242.	0.121	39.09	1.005D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-207	149.51	74.97	488.	0.	0.000	0.00	0.000D
PB-214	153.79	77.11	435.	352.	0.176	29.77	1.006D
PB-212	153.79	77.11	648.	0.	0.000	5094.11	0.453D
CE-144	159.81	80.12	436.	0.	0.000	0.00	0.585D
EU-155	172.48	86.45	369.	0.	0.000	0.00	1.013D
NP-237	172.20	86.31	369.	0.	0.000	0.00	1.013
CD-109	175.66	88.04	557.	0.	0.000	0.00	1.014D
TH-234	184.34	92.38	356.	29.	0.014	282.33	1.017D
TH-234	185.18	92.80	357.	85.	0.042	100.35	1.018D
NP-237	191.32	95.87	350.	13.	0.006	638.04	1.020D
Cm-243	198.69	99.55	311.	52.	0.026	151.13	1.023D
Cm-243	207.11	103.76	313.	47.	0.023	166.91	1.026D
EU-155	210.21	105.31	301.	79.	0.040	98.61	1.027D
TE-132	223.52	111.96	415.	99.	0.049	154.19	1.672s
TE-132	232.20	116.30	280.	0.	0.000	0.00	0.984D
Cm-243	231.58	115.99	280.	70.	0.035	156.30	0.984s
EU-152	243.16	121.78	301.	13.	0.006	585.29	1.038D
CO-57	243.74	122.07	315.	0.	0.000	0.00	1.039D
EU-154	245.80	123.10	315.	12.	0.006	639.66	1.039D
CE-144	266.67	133.53	164.	11.	0.005	505.97	1.047D
CO-57	272.48	136.43	282.	32.	0.016	226.17	1.049D
U-235	287.14	143.76	334.	77.	0.038	106.74	1.054D
CE-141	290.52	145.45	300.	56.	0.028	136.67	1.055D
TE-131	299.07	149.72	218.	37.	0.019	175.16	1.058D
U-235	326.13	163.24	168.	0.	0.000	0.00	1.068
CE-139	330.35	165.36	284.	35.	0.018	337.47	0.697s
SB-125	351.13	175.74	275.	80.	0.040	155.97	3.288s
U-235	371.10	185.72	326.	418.	0.209	4.35	1.084A
RA-226	371.64	185.99	165.	0.	0.000	5449.77	1.550A
U-235	410.29	205.31	199.	46.	0.023	138.21	1.098D
TE-132	454.51	227.41	147.	49.	0.024	163.20	0.928s
TH-227	471.70	236.00	143.	14.	0.007	358.57	1.120D
PB-212	476.96	238.63	152.	783.	0.392	12.63	1.122D
RA-224	481.70	241.00	184.	47.	0.023	130.26	1.584A
PB-214	483.54	241.92	194.	83.	0.042	8.41	1.124A
SN-113	509.79	255.04	120.	5.	0.003	926.65	1.133D
TH-227	512.21	256.25	126.	26.	0.013	192.93	1.134D
Cm-243	554.93	277.60	131.	27.	0.014	187.53	1.149D
HG-203	558.07	279.17	149.	3.	0.001	640.40	1.150D
J-131	568.69	284.48	40.	16.	0.008	218.66	0.708s
PB-214	590.19	295.22	99.	201.	0.100	29.85	1.161D
CR-51	639.00	319.62	39.	1.	0.000	2441.31	0.000s
AC-228	676.70	338.46	132.	161.	0.080	44.90	1.270s
EU-152	687.00	343.61	24.	0.	0.000	0.00	0.125s
PB-214	703.89	352.05	94.	276.	0.138	24.63	1.119
J-131	730.12	365.16	58.	28.	0.014	197.00	1.810s
SN-113	781.92	391.04	86.	38.	0.019	197.07	0.617s
SB-125	853.20	426.67	73.	12.	0.006	380.92	0.583s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Ag-108M	872.00	436.06	51.	16.	0.008	224.61	0.000s
TE-131	905.33	452.72	12.	2.	0.001	670.82	0.514s
SB-125	926.92	463.51	71.	15.	0.008	248.88	1.278D
TE-131	983.29	491.68	37.	12.	0.006	247.39	1.247
TL-208	1021.38	510.72	70.	96.	0.048	47.86	1.311D
Kr-85	1027.92	513.99	86.	4.	0.002	1037.51	1.313D
CS-134	1138.48	569.24	40.	0.	0.000	0.00	1.350
BI-207	1139.85	569.93	30.	10.	0.005	269.46	1.281
TL-208	1166.47	583.23	42.	219.	0.109	25.22	1.176s
SB-125	1201.57	600.77	33.	0.	0.000	0.00	0.663D
CS-134	1209.35	604.66	35.	13.	0.007	208.90	1.374D
BI-214	1218.68	609.32	38.	177.	0.088	27.06	1.378D
Ag-108M	1228.78	614.37	21.	0.	0.000	0.00	0.546D
SB-125	1272.36	636.15	31.	0.	0.000	0.00	0.383D
J-131	1272.90	636.42	38.	11.	0.005	298.83	0.432s
AG-110M	1315.58	657.75	17.	15.	0.008	141.01	1.410D
CS-137	1323.33	661.62	23.	20.	0.010	122.18	1.413D
NB-94	1405.35	702.61	21.	21.	0.010	121.84	0.544s
Ag-108M	1446.05	722.95	20.	0.	0.000	0.00	1.454D
EU-154	1446.75	723.30	22.	0.	0.000	8819.42	1.454D
BI-212	1454.49	727.17	22.	57.	0.028	53.16	1.457D
EU-152	1560.46	780.13	27.	17.	0.009	162.77	1.777s
BI-212	1571.01	785.40	24.	24.	0.012	118.87	1.437s
CS-134	1591.75	795.76	34.	22.	0.011	131.45	1.502D
CS-134	1603.91	801.84	27.	9.	0.005	255.51	1.506D
CO-58	1621.67	810.71	6.	1.	0.001	994.99	0.450s
MN-54	1670.12	834.93	35.	18.	0.009	193.41	1.112
MN-56	1692.30	846.01	22.	20.	0.010	139.10	1.099
NB-94	1745.06	872.38	22.	13.	0.007	200.30	0.761s
AG-110M	1768.50	884.09	20.	8.	0.004	277.26	0.740s
Y-88	1794.00	896.83	21.	4.	0.002	458.26	0.416s
AC-228	1822.39	911.02	28.	129.	0.064	34.38	1.653
AG-110M	1874.00	936.81	6.	0.	0.000	0.00	0.125s
EU-152	1928.41	964.00	37.	21.	0.010	142.19	1.612D
AC-228	1938.21	968.90	26.	85.	0.042	41.31	1.616D
EU-154	2010.00	1004.77	4.	0.	0.000	0.00	0.000s
BI-207	2128.00	1063.74	7.	0.	0.000	0.00	0.000s
FE-59	2194.56	1097.00	20.	10.	0.005	249.67	0.592s
EU-152	2224.72	1112.07	38.	6.	0.003	462.03	1.708D
ZN-65	2231.62	1115.52	35.	3.	0.001	904.53	1.710D
BI-214	2241.15	1120.28	39.	41.	0.020	80.54	1.713D
TA-182	2243.15	1121.28	81.	5.	0.003	757.94	1.713D
TE-131	2295.00	1147.19	21.	6.	0.003	382.43	0.000s
CO-60	2347.02	1173.18	31.	13.	0.007	143.87	1.197s
TA-182	2379.24	1189.28	34.	17.	0.009	192.51	0.538s
TA-182	2444.00	1221.64	5.	0.	0.000	0.00	0.000s
EU-154	2544.83	1272.03	16.	21.	0.010	127.51	0.666s
FE-59	2581.10	1290.15	21.	21.	0.010	146.39	0.791s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CO-60	2669.87	1334.51	18.	0.	0.000	0.00	0.964s
AG-110M	2770.00	1384.54	4.	4.	0.002	273.86	0.739s
EU-152	2819.00	1409.03	5.	2.	0.001	519.62	0.367s
K-40	2922.09	1460.54	6.	677.	0.338	11.73	1.881
BI-212	3243.17	1620.97	0.	10.	0.005	94.87	1.249s
BI-214	3530.24	1764.40	0.	43.	0.022	45.75	1.582
MN-56	3624.00	1811.25	1.	0.	0.000	0.00	0.000s
Y-88	3674.67	1836.56	1.	0.	0.000	360.56	0.394s

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 microCi	Peak Energy keV	Peak Activity microCi	Code	MDA Value microCi	Comments
K-40		2.9058E-02	1460.75	2.906E-02	(	6.062E-04	G
CR-51		0.0000E+00	320.07	0.000E+00	%	3.667E-04	G
MN-54		5.0631E-05	834.81	5.063E-05	(	8.517E-05	G
MN-56		5.7528E-05	846.60	5.753E-05	?(	7.067E-05	G
			1811.20	0.000E+00	?	1.512E-04	G
FE-59		1.2215E-04	1099.22	6.234E-05	&(	1.499E-04	G
			1291.56	2.004E-04	&(	2.296E-04	G
CO-57		1.9704E-04	122.07	0.000E+00	} P	6.379E-05	G
			136.43	1.970E-04	$(	4.925E-04	G
CO-58		0.0000E+00	810.75	0.000E+00	%	3.891E-05	G
CO-60		0.0000E+00	1332.51	0.000E+00	& P	9.557E-05	G
			1173.23	4.972E-05	$ P	1.086E-04	G
Cm-243		1.7829E-04	277.60	1.924E-04	(	3.964E-04	G
			117.00	4.145E-04	}	4.778E-04	G
			103.76	1.324E-04	(	2.419E-04	G
			99.55	2.382E-04	(	3.925E-04	G
ZN-65		0.0000E+00	1115.52	0.000E+00	%	2.169E-04	G
Kr-85		0.0000E+00	513.99	0.000E+00	%	1.915E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Y-88	0.0000E+00	1836.01	0.000E+00	% P	4.191E-05		G
		898.02	0.000E+00	& P	7.649E-05		G
NB-94	4.3842E-05	871.10	3.797E-05	&(	7.176E-05		G
		702.50	4.971E-05	$(	5.829E-05		G
Ag-108M	0.0000E+00	722.95	0.000E+00	}	6.427E-05		G
		614.37	0.000E+00	?	5.654E-05		G
		433.93	2.703E-05	&	6.081E-05		G
AG-110M	3.9186E-05	657.75	3.590E-05	(	5.295E-05		G
		884.67	3.251E-05	(	9.571E-05		G
		937.48	0.000E+00	?	1.283E-04		G
		1384.27	7.195E-05	(	2.164E-04		G
CD-109	0.0000E+00	88.04	0.000E+00	%	2.079E-03		G
SN-113	8.1969E-05	391.71	8.197E-05	&(P	9.813E-05		G
		255.04	0.000E+00	%	2.382E-03		G
SB-125	0.0000E+00	427.95	0.000E+00	&	2.157E-04		G
		600.77	0.000E+00	&	3.347E-04		G
		636.15	0.000E+00	}	5.587E-04		G
		463.51	2.446E-04		6.796E-04		G
		176.29	8.965E-04	&	8.963E-04		G
TE-131	6.0517E-05	149.72	3.565E-05	(	6.843E-05		G
		452.32	0.000E+00	%	1.637E-04		G
		1146.96	0.000E+00	%	1.803E-03		G
		492.66	4.147E-04	&(	1.108E-03		G
TE-132	1.1582E-04	228.16	4.635E-05	&(	5.601E-05		G
		116.30	0.000E+00	}	2.648E-03		G
		111.76	3.439E-03	*(	3.392E-03		G
J-131	6.0294E-05	364.48	4.490E-05	&(	6.041E-05		G
		636.97	3.224E-04	}	9.540E-04		G
		284.29	2.668E-04	?(	5.367E-04		G
CS-134	5.7898E-05	604.66	2.803E-05	(	6.484E-05		G
		795.76	6.842E-05	(	9.466E-05		G
		569.29	0.000E+00	}	4.121E-04		G
		801.84	2.889E-04	(	8.324E-04		G
CS-137	5.3670E-05	661.62	5.367E-05	(	6.746E-05		G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-139	0.0000E+00	165.85	0.000E+00	% P	6.957E-05		G
CE-141	7.6617E-05	145.45	7.662E-05	(	1.137E-04		G
CE-144	0.0000E+00	133.53	0.000E+00	%	3.715E-04		G
		80.12	0.000E+00	&	4.709E-03		G
EU-152	0.0000E+00	121.78	0.000E+00	}	1.827E-04		G
		344.30	0.000E+00	&	1.145E-04		G
		1408.08	0.000E+00	%	2.752E-04		G
		964.00	4.514E-04	$	6.836E-04		G
		1112.07	0.000E+00	%	8.388E-04		G
		778.90	3.526E-04	&	5.447E-04		G
EU-154	0.0000E+00	123.10	0.000E+00	%	1.349E-04		G
		1274.80	2.411E-04	&	2.451E-04		G
		723.30	0.000E+00	}	3.067E-04		G
		1004.80	0.000E+00	?	2.264E-04		G
EU-155	2.3653E-04	86.45	0.000E+00	}	1.993E-04		G
		105.31	2.365E-04	$(	2.489E-04		G
TA-182	3.0963E-04	67.75	2.751E-04	*(	2.851E-04		G
		1121.28	0.000E+00	%	4.646E-04		G
		1221.42	0.000E+00	?	1.881E-04		G
		1189.05	3.964E-04	@(	6.967E-04		G
HG-203	0.0000E+00	279.17	0.000E+00	% P	7.266E-05		G
		72.87	5.583E-04		1.268E-03		G
TL-208	5.1442E-04	583.14	5.144E-04	@(	7.750E-05		G
		510.72	7.616E-04	+	3.294E-04		G
PB-212	1.5773E-03	238.63	1.577E-03	(	1.211E-04		G
		77.11	0.000E+00	}	5.446E-04		Energy duplication
		74.81	2.057E-03	}	7.913E-04		G
PB-214	9.7861E-04	351.99	9.186E-04	(	1.601E-04		G
		295.22	1.095E-03	(	2.679E-04		G
		77.11	2.586E-03	}	7.332E-04		Energy duplication
		241.92	9.786E-04	}	7.936E-04		G
BI-207	0.0000E+00	569.67	1.950E-05	}	5.725E-05		G
		1063.62	0.000E+00	%	6.664E-05		G
		74.97	0.000E+00	}	2.230E-04		G

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
BI-212	1.3151E-03	727.17	1.195E-03	(	5.193E-04	G
		1620.56	1.832E-03	?(	1.350E-03	G
		785.42	3.217E-03	+	3.389E-03	G
BI-214	8.5089E-04	609.32	8.071E-04	(	1.446E-04	G
		1764.51	1.471E-03	+	2.521E-04	G
		1120.28	9.852E-04	(	7.731E-04	G
RA-224	1.0535E-03	241.00	1.054E-03	}(	2.272E-03	G
RA-226	0.0000E+00	185.99	0.000E+00	}	1.387E-03	G
AC-228	1.4619E-03	911.07	1.350E-03	(	2.876E-04	G
		968.90	1.556E-03	(	4.836E-04	G
		338.40	1.594E-03	@(	5.580E-04	G
TH-227	0.0000E+00	236.00	0.000E+00	%	4.479E-04	G
		256.25	3.512E-04		7.455E-04	G
TH-234	1.6394E-03	63.29	1.639E-03	(	2.701E-03	G
		92.80	1.914E-03	}	2.056E-03	G
		92.38	7.663E-04	}	2.401E-03	G
U-235	5.6240E-04	185.72	5.624E-04	}	1.169E-04	G
		143.76	4.767E-04	(	5.461E-04	G
		205.31	7.539E-04	(	1.129E-03	G
		163.35	0.000E+00		9.142E-04	G
NP-237	0.0000E+00	86.49	0.000E+00	}	4.981E-04	G
		95.87	0.000E+00	%	2.034E-03	G
AM-241	1.1374E-04	59.54	1.137E-04	(P	3.276E-04	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
K-40		1.2706E+01	1.2706E+01	1.4907E+00	1.6546E+00
CR-51	<	1.6033E-01	2.0649E-01		
MN-54	A	2.2139E-02	2.2641E-02	4.3790E-02	4.3809E-02
MN-56	#A	2.5154E-02	>12 Halflives	3.4991E-02	3.5019E-02
FE-59	#A	5.3410E-02	6.2389E-02	9.0283E-02	9.0351E-02
CO-57	A	8.6156E-02	8.8422E-02	1.9998E-01	2.0004E-01
CO-58	<	1.7013E-02	1.8784E-02		
CO-60	<	4.1789E-02	4.1941E-02		
Cm-243	A	7.7958E-02	7.8005E-02	7.6192E-02	7.6319E-02
ZN-65	<	9.4852E-02	9.7618E-02		
Kr-85	<	8.3730E+02	8.3736E+02		
Y-88	<	1.8327E-02	1.9572E-02		
NB-94	A	1.9170E-02	1.9170E-02	2.2471E-02	2.2497E-02
Ag-108M	<	2.4722E-02	2.4726E-02		
AG-110M	A	1.7134E-02	1.7621E-02	2.4343E-02	2.4364E-02
CD-109	<	9.0919E-01	9.2336E-01		
SN-113	#A	3.5841E-02	3.8091E-02	7.7417E-02	7.7447E-02
SB-125	<	9.4309E-02	9.4964E-02		
TE-131	A	2.6461E-02	>12 Halflives	4.0104E-02	4.0131E-02
TE-132	#	5.0641E-02	4.3863E-01	4.9239E-01	4.9301E-01
J-131	#A	2.6364E-02	6.3030E-02	9.2753E-02	9.2822E-02
CS-134	A	2.5316E-02	2.5553E-02	3.0259E-02	3.0293E-02
CS-137	A	2.3467E-02	2.3482E-02	2.8691E-02	2.8722E-02
CE-139	<	3.0419E-02	3.2010E-02		
CE-141	A	3.3501E-02	4.1596E-02	5.6848E-02	5.6895E-02
CE-144	<	1.6246E-01	1.6652E-01		
EU-152	<	5.0076E-02	5.0151E-02		
EU-154	<	5.8996E-02	5.9129E-02		
EU-155	A	1.0342E-01	1.0382E-01	1.0239E-01	1.0255E-01
TA-182	#	1.3539E-01	1.4389E-01	1.9000E-01	1.9017E-01

HG-203	<	3.1772E-02	3.6929E-02

TL-208		2.2493E-01	>12 Halflives	5.6717E-02	5.8123E-02
PB-212		6.8967E-01	>12 Halflives	8.7085E-02	9.5406E-02
PB-214		4.2790E-01	>12 Halflives	8.2805E-02	8.6262E-02
BI-207	<	2.9139E-02	2.9154E-02		
BI-212		5.7503E-01	>12 Halflives	3.0571E-01	3.0743E-01
BI-214		3.7205E-01	>12 Halflives	1.0067E-01	1.0285E-01
RA-224	#	4.6067E-01	3.1255E+00	5.4228E+03	4.0751E+00
AC-228		6.3924E-01	>12 Halflives	1.4922E-01	1.5353E-01
TH-227	<	1.9586E-01	2.8606E-01		
TH-234	A	7.1681E-01	9.5872E-01	1.4482E+00	1.4491E+00
U-235		2.4591E-01	2.4591E-01	2.1471E-01	2.1514E-01
NP-237	<	8.8951E-01	8.8951E-01		
AM-241	A	4.9735E-02	4.9737E-02	1.2902E-01	1.2905E-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 2023.1 keV) 1.4888666E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 1.8251881E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

Yankee Chemistry Spectrum name: 101F_16DEC2004_1645.An1

Sample description
Detector 101 FSS_OOL-04-01-015-F-S WET

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_16DEC2004_1645.An1

Acquisition information
Start time: 16-Dec-2004 16:36:53
Live time: 2000
Real time: 2002
Dead time: 0.09 %
Detector ID: 1

Detector system
Det 101- DSPE-633

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

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

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

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

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9790E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9790E+03) = 5.0531E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_16DEC2004_1645.An1

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	03-Dec-2004 13:57:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1144

***** 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
75.21	141.	20.97	1.01	1.666E-02	74.81	9.600	6.072E-01	PB212
77.12	235.	18.79	1.50	1.720E-02	77.11	10.700	8.717E-01	PB214
					77.11	17.500	5.330E-01	PB212
77.12	235.	18.79	1.50	1.720E-02	77.11	10.700	8.717E-01	PB214
					77.11	17.500	5.330E-01	PB212
93.11	119.	33.57	1.50	1.989E-02	92.38	2.570	1.599E+00	TH234
					92.80	3.000	1.366E+00	TH234
93.14	119.	34.12	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.361E+00	TH234
129.62	101.	34.64	1.11	2.109E-02				
186.16	98.	25.85	1.27	1.857E-02	185.99	3.280	1.101E+00	RA226
238.70	618.	4.77	1.12	1.558E-02				
238.70	618.	4.77	1.12	1.558E-02	238.63	43.100	6.283E-01	PB212
242.20	96.	21.24	1.12	1.539E-02				
295.32	180.	12.92	1.35	1.292E-02	295.22	19.200	4.969E-01	PB214
338.47	130.	15.68	1.16	1.135E-02	338.40	12.010	6.512E-01	AC228
351.79	280.	8.97	1.05	1.093E-02				
351.79	280.	8.97	1.05	1.093E-02	351.99	37.100	4.724E-01	PB214
511.04	68.	21.09	0.67	7.586E-03	510.72	22.500	2.719E-01	TL208
583.09	214.	9.66	1.26	6.685E-03	583.14	86.000	2.537E-01	TL208
609.16	210.	9.34	1.44	6.414E-03	609.32	46.090	4.859E-01	BI214
661.64	104.	15.10	1.38	5.937E-03	661.62	84.620	1.409E-01	CS137
727.06	57.	20.61	2.05	5.444E-03	727.17	11.800	6.103E-01	BI212
794.77	20.	40.59	1.50	5.016E-03	795.76	85.400	PBC<MDA	CS134
911.00	135.	12.28	1.25	4.447E-03	911.07	29.000	7.149E-01	AC228
968.11	114.	14.03	1.36	4.215E-03	968.90	17.460	1.058E+00	AC228

1119.77	56.	20.49	1.98	3.711E-03	1120.28	15.040	6.852E-01	BI214
1460.57	472.	4.82	2.03	2.943E-03	1460.75	10.700	1.025E+01	K40
1764.04	32.	18.85	0.78	2.481E-03	1764.51	15.920	5.445E-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	
149.98	75.21	368.	141.	0.071	62.92	1.005	PB-214	D
258.86	129.62	486.	101.	0.050	103.91	1.113	AC-228	l
484.10	242.08	158.	96.	0.048	63.73	1.124	PB-214	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	149.17	74.80	990.	142.	0.071	97.33	1.499
PB-214	153.79	77.11	858.	235.	0.118	56.38	1.499D
PB-212	153.79	77.11	858.	235.	0.118	56.38	1.499D
TH-234	185.86	93.14	764.	119.	0.059	102.37	1.499s
TH-234	185.81	93.11	744.	119.	0.060	100.71	1.499s
RA-226	371.84	186.09	401.	104.	0.052	86.56	1.499s
PB-212	477.10	238.70	386.	495.	0.247	21.59	1.499
RA-224	484.41	242.35	404.	85.	0.042	105.85	1.499s
PB-214	590.38	295.32	164.	178.	0.089	37.89	1.499
AC-228	676.72	338.47	119.	130.	0.065	47.05	1.156
PB-214	703.51	351.86	88.	253.	0.127	24.57	1.499
TL-208	1022.03	511.04	51.	68.	0.034	63.27	0.675s
TL-208	1166.19	583.09	64.	214.	0.107	28.99	1.255s
BI-214	1218.36	609.16	57.	210.	0.105	28.03	1.440
CS-137	1323.36	661.64	50.	104.	0.052	45.30	1.375
BI-212	1454.27	727.06	31.	57.	0.029	61.84	2.052s
CS-134	1589.76	794.77	23.	20.	0.010	121.76	1.502
AC-228	1822.35	911.00	40.	135.	0.068	36.85	1.248
AC-228	1936.63	968.11	33.	114.	0.057	42.10	1.362s
BI-214	2240.13	1119.77	27.	56.	0.028	61.46	1.975
K-40	2922.15	1460.57	10.	472.	0.236	14.47	2.027
BI-214	3529.52	1764.04	2.	32.	0.016	56.54	0.777s

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		1.4467E-01					
			477.56	1.447E-01	%(	3.856E-01	1.15E-01 G
K-40		1.0248E+01					
			1460.75	1.025E+01	(	3.863E-01	4.94E-01 G
MN-54		1.8450E-02					
			834.81	1.845E-02	%(	4.489E-02	1.35E-02 G
CO-57		2.3486E-03					
			122.07	2.349E-03	&(P	4.508E-02	1.34E-02 G K
			136.43	-3.029E-03	%	3.802E-01	1.13E-01 G
CO-60		-7.6827E-03					
			1332.51	-7.683E-03	&(P	5.433E-02	1.30E-02 G K
			1173.23	-6.033E-03	& P	6.234E-02	1.62E-02 G K
Sr-85		-1.4684E-02					
			514.00	-1.468E-02	%(	5.192E-02	1.54E-02 G
Kr-85		-2.9442E+02					
			513.99	-2.944E+02	%(	1.042E+03	3.09E+02 G
Y-88		-7.0851E-03					
			1836.01	-7.085E-03	%(P	4.656E-02	1.22E-02 G K
			898.02	-7.456E-04	% P	4.182E-02	1.11E-02 G
NB-94		-1.7784E-03					
			871.10	-1.778E-03	&(	4.436E-02	1.24E-02 G K
			702.50	-5.205E-03	&	4.060E-02	1.16E-02 G K
Ag-108M		-1.3350E-02					
			722.95	-1.335E-02	%(	5.261E-02	1.54E-02 G K
			614.37	-1.810E-02	%	5.001E-02	1.49E-02 G
			433.93	5.251E-05	%	4.387E-02	1.26E-02 G
CD-109		5.7894E-01					
			88.04	5.789E-01	%(	1.283E+00	3.89E-01 G
SN-113		-1.4681E-03					
			391.71	-1.468E-03	%(P	6.228E-02	1.78E-02 G K
			255.04	-3.722E-02	%	1.879E+00	5.51E-01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.8965E-02						
		427.95	1.897E-02	&(	1.184E-01	3.45E-02	G K
		600.77	-3.304E-02	%	2.050E-01	5.91E-02	G
		636.15	3.833E-02	&	2.792E-01	7.90E-02	G
		463.51	1.896E-01	%	3.639E-01	1.11E-01	G
		176.29	-1.027E-01	%	5.967E-01	1.78E-01	G
I-131	-2.5995E-02						
		364.48	-2.600E-02	%(	1.399E-01	4.12E-02	G K
		636.97	1.419E-01	&	1.156E+00	3.22E-01	G
		284.29	3.515E-01	%	1.342E+00	3.97E-01	G
CS-134	1.5804E-02						
		604.66	1.167E-03	%(	1.011E-01	2.98E-02	G K
		795.76	3.253E-02	(	4.075E-02	1.32E-02	G
		569.29	-3.605E-02	&	2.868E-01	8.31E-02	G
		801.84	-9.446E-02	%	5.608E-01	1.62E-01	G
CS-137	1.4092E-01						
		661.62	1.409E-01	(	4.869E-02	2.13E-02	G
CE-139	-7.4791E-03						
		165.85	-7.479E-03	%(P	5.120E-02	1.53E-02	G
EU-152	-1.6989E-03						
		121.78	-1.699E-03	&(	1.296E-01	3.84E-02	G K
		344.30	3.741E-02	%	1.259E-01	3.75E-02	G
		1408.08	5.604E-02	%	2.119E-01	6.07E-02	G
		964.00	5.454E-03	%	2.510E-01	6.75E-02	G
		1112.07	1.398E-01	&	3.749E-01	1.11E-01	G
		778.90	-3.663E-02	%	3.345E-01	9.51E-02	G
EU-154	-2.1187E-03						
		123.10	-2.119E-03	%(	9.331E-02	2.77E-02	G K
		1274.80	-9.749E-04	&	1.511E-01	4.11E-02	G
		723.30	-6.320E-02	%	2.440E-01	7.17E-02	G
		1004.80	-1.285E-04	&	2.735E-01	7.52E-02	G
EU-155	5.6979E-02						
		86.45	5.698E-02	&(	1.288E-01	3.90E-02	G K
		105.31	6.436E-02	%	1.876E-01	5.66E-02	G
HG-203	-2.8665E-03						
		279.17	-2.867E-03	%(P	4.120E-02	1.17E-02	G K
		72.87	-2.601E-01	&	1.313E+00	3.95E-01	G
		70.83	6.279E-01	%	1.911E+00	5.76E-01	G
		82.50	-5.037E-01	&	2.585E+00	7.74E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.5749E-01						
		583.14	2.537E-01	@(	4.764E-02	2.45E-02	G
		510.72	2.719E-01	@(	1.439E-01	5.74E-02	G
PB-212	5.2527E-01						
		238.63	5.031E-01	(	9.590E-02	3.62E-02	G K
							Energy duplication
		77.11	5.330E-01	(	3.157E-01	1.00E-01	G
		74.81	6.106E-01	&(	6.422E-01	1.98E-01	G
PB-214	4.4838E-01						
		351.99	4.267E-01	(	7.840E-02	3.49E-02	G K
		295.22	4.903E-01	(	1.717E-01	6.19E-02	G
							Energy duplication
		77.11	8.717E-01	+	5.164E-01	1.64E-01	G
		241.92	-1.120E-02	%	6.929E-01	2.06E-01	G
BI-212	6.1027E-01						
		727.17	6.103E-01	(	3.029E-01	1.26E-01	G K
		1620.56	7.293E-01	%	1.368E+00	4.27E-01	G
		785.42	8.861E-01	%	2.146E+00	6.44E-01	G
BI-214	5.0092E-01						
		609.32	4.859E-01	(	8.733E-02	4.54E-02	G K
		1764.51	5.445E-01	(	1.455E-01	1.03E-01	G
		1120.28	6.852E-01	+	3.294E-01	1.40E-01	G
RA-224	9.5933E-01						
		241.00	9.593E-01	(	1.092E+00	3.38E-01	G
RA-226	1.1688E+00						
		185.99	1.169E+00	@(	1.076E+00	3.37E-01	G
AC-228	6.9625E-01						
		911.07	7.149E-01	(	1.704E-01	8.78E-02	G K
		968.90	1.058E+00	+	2.737E-01	1.48E-01	G
		338.40	6.512E-01	(	2.682E-01	1.02E-01	G
TH-227	-5.8502E-02						
		236.00	-5.850E-02	%(	4.001E-01	1.19E-01	G K
		256.25	-4.172E-02	&	5.213E-01	1.54E-01	G
PA-234	3.1984E-02						
		98.44	3.198E-02	%(	1.673E-01	5.01E-02	G K
		946.00	-3.145E-02	%	2.477E-01	7.04E-02	G
		131.28	4.033E-02	%	1.971E-01	5.90E-02	G
		94.67	-9.718E-02	%	3.024E-01	9.11E-02	G
		883.24	3.797E-02	&	3.778E-01	1.07E-01	G
		926.70	-3.351E-02	%	3.818E-01	1.06E-01	G

Yankee Chemistry Spectrum name: 101F_16DEC2004_1645.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		569.26	-5.260E-02	&	4.204E-01	1.22E-01	G
TH-234	8.7184E-01						
		63.29	1.665E-02	%(	2.051E+00	6.10E-01	G K
		92.80	1.366E+00	*(	1.485E+00	4.59E-01	G
		92.38	1.592E+00	&(	1.761E+00	5.43E-01	G
AM-241	-5.3515E-03						
		59.54	-5.352E-03	%(P	2.710E-01	8.05E-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	

- -

***** 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	1.2203E-01	1.4467E-01	3.4585E-01	3.4595E-01	3.252E-01
K-40		1.0248E+01	1.0248E+01	1.4834E+00	1.5924E+00	
MN-54	#A	1.7921E-02	1.8450E-02	4.0391E-02	4.0405E-02	4.361E-02
CO-57	#B	2.2709E-03	2.3486E-03	4.0156E-02	4.0156E-02	4.358E-02
CO-60	#B	-7.6465E-03	-7.6827E-03	1.3549E-01	1.3549E-01	5.408E-02

Sr-85	#A	-1.2764E-02	-1.4684E-02	4.6205E-02	4.6213E-02	4.513E-02
Kr-85	#A	-2.9440E+02	-2.9442E+02	9.2721E+02	9.2736E+02	1.042E+03
Y-88	#B	-6.5062E-03	-7.0851E-03	4.5489E-02	4.5491E-02	4.275E-02
NB-94	#B	-1.7784E-03	-1.7784E-03	3.7068E-02	3.7068E-02	4.436E-02
Ag-108M	#B	-1.3348E-02	-1.3350E-02	4.6319E-02	4.6325E-02	5.260E-02
CD-109	#A	5.6744E-01	5.7894E-01	1.1662E+00	1.1667E+00	1.258E+00
SN-113	#B	-1.3566E-03	-1.4681E-03	2.4134E+00	2.4134E+00	5.755E-02
SB-125	#B	1.8796E-02	1.8965E-02	1.0355E-01	1.0355E-01	1.173E-01
I-131	#B	-8.3945E-03	-2.5995E-02	1.2364E-01	1.2365E-01	4.518E-02
CS-134	#B	1.5615E-02	1.5804E-02	1.9243E-02	1.9264E-02	9.993E-02
CS-137		1.4080E-01	1.4092E-01	6.3836E-02	6.4330E-02	
CE-139	#A	-7.0008E-03	-7.4791E-03	4.6601E-02	4.6603E-02	4.792E-02
EU-152	#B	-1.6956E-03	-1.6989E-03	1.1529E-01	1.1529E-01	1.293E-01
EU-154	#B	-2.1125E-03	-2.1187E-03	8.3074E-02	8.3074E-02	9.304E-02
EU-155	#B	5.6694E-02	5.6979E-02	1.1697E-01	1.1701E-01	1.281E-01
HG-203	#B	-2.3585E-03	-2.8665E-03	2.4595E-01	2.4595E-01	3.390E-02
TL-208	#	2.5749E-01	2.5749E-01	7.4652E-02	7.6057E-02	
PB-212	#	5.2527E-01	5.2527E-01	1.1340E-01	1.1722E-01	9.590E-02
PB-214	#	4.4838E-01	4.4838E-01	1.0124E-01	1.0436E-01	7.840E-02
BI-212		6.1027E-01	6.1027E-01	3.7742E-01	3.7899E-01	
BI-214		5.0092E-01	5.0092E-01	1.4041E-01	1.4323E-01	
RA-224	#A	9.5933E-01	9.5933E-01	1.0155E+00	1.0169E+00	1.092E+00
RA-226	#	1.1688E+00	1.1688E+00	1.0118E+00	1.0139E+00	1.076E+00
AC-228		6.9625E-01	6.9625E-01	2.0804E-01	2.1173E-01	
TH-227	#B	-5.8502E-02	-5.8502E-02	3.5755E-01	3.5757E-01	4.001E-01
PA-234	#B	3.1984E-02	3.1984E-02	1.5031E-01	1.5032E-01	1.673E-01
TH-234	#B	8.7184E-01	8.7184E-01	8.7805E-01	8.7938E-01	2.051E+00
AM-241	#A	-5.3512E-03	-5.3515E-03	2.9898E-01	2.9898E-01	2.710E-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 (86.7 to 1999.1 keV) 1.2453506E+01 pCi/gm
Total Decayed Activity (86.7 to 1999.1 keV) 1.2453622E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_16DEC2004_1720.An1

Sample description
Detector 101 FSS_OOL-04-01-004-F-S WET

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_16DEC2004_1720.An1

Acquisition information
Start time: 16-Dec-2004 17:13:19
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: 1.8470E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8470E+03) =
5.4142E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_16DEC2004_1720.An1

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	03-Dec-2004 10:35:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0849

***** 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	176.	15.33	1.00	1.654E-02	74.81	9.600	8.110E-01	PB212
77.10	203.	11.31	1.01	1.720E-02	77.11	17.500	6.194E-01	PB212
					77.11	10.700	1.013E+00	PB214
92.91	93.	38.25	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.138E+00	TH234
92.94	91.	39.19	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.119E+00	TH234
185.87	110.	24.38	1.55	1.859E-02				
185.87	110.	24.38	1.55	1.859E-02	185.99	3.280	1.323E+00	RA226
209.39	54.	31.23	0.82	1.721E-02				
238.72	551.	4.98	1.12	1.557E-02	238.63	43.100	6.007E-01	PB212
242.01	79.	22.14	1.12	1.540E-02	241.00	3.900	9.608E-01	RA224
					241.92	7.470	5.032E-01	PB214
295.31	154.	13.86	1.10	1.292E-02	295.22	19.200	4.557E-01	PB214
328.32	45.	33.46	1.18	1.169E-02				
339.08	107.	19.48	1.08	1.133E-02	338.40	12.010	5.743E-01	AC228
351.72	236.	8.97	1.16	1.093E-02	351.99	37.100	4.257E-01	PB214
463.34	36.	37.98	1.31	8.345E-03				
463.34	36.	37.98	1.31	8.345E-03	463.51	10.000	3.142E-01	SB125
510.00	123.	16.91	1.42	7.601E-03	510.72	22.500	5.261E-01	TL208
582.91	182.	10.18	1.40	6.687E-03	583.14	86.000	2.323E-01	TL208
609.01	190.	9.79	1.33	6.416E-03	609.32	46.090	4.693E-01	BI214
661.63	167.	10.32	1.49	5.937E-03	661.62	84.620	2.432E-01	CS137
727.44	60.	21.82	1.21	5.441E-03	727.17	11.800	6.892E-01	BI212
911.04	108.	11.45	1.65	4.447E-03	911.07	29.000	6.151E-01	AC228
968.69	82.	19.28	1.45	4.213E-03	968.90	17.460	8.158E-01	AC228

1120.23	68.	19.39	0.98	3.711E-03	1120.28	15.040	8.967E-01	BI214
1460.49	390.	5.15	1.92	2.943E-03	1460.75	10.700	9.058E+00	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
418.46	209.39	128.	54.	0.027	93.69	0.816	AC-228
656.41	328.32	81.	45.	0.023	100.38	1.180	RH-106M
926.57	463.34	58.	36.	0.018	113.93	1.306	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	149.19	74.81	276.	176.	0.088	45.99	1.005D
PB-212	153.79	77.11	290.	203.	0.102	33.92	1.006A
TH-234	185.47	92.94	594.	91.	0.046	117.56	1.499
TH-234	185.41	92.91	583.	93.	0.046	114.75	1.499
RA-226	371.90	186.12	323.	90.	0.045	90.57	1.499s
PB-212	476.96	238.63	101.	551.	0.276	14.94	1.122D
PB-214	483.54	241.92	114.	79.	0.040	66.42	1.124D
PB-214	590.37	295.31	122.	154.	0.077	41.57	1.097
AC-228	677.94	339.08	117.	107.	0.054	58.45	1.078s
PB-214	703.23	351.72	88.	236.	0.118	26.91	1.155s
TL-208	1019.93	510.00	81.	123.	0.061	50.74	1.424s
TL-208	1165.83	582.91	52.	182.	0.091	30.54	1.401
BI-214	1218.06	609.01	48.	190.	0.095	29.37	1.325s
CS-137	1323.35	661.63	35.	167.	0.083	30.97	1.494
BI-212	1455.03	727.44	32.	60.	0.030	65.46	1.214s
AC-228	1822.43	911.04	18.	108.	0.054	34.36	1.651
AC-228	1937.80	968.69	42.	82.	0.041	57.85	1.450
BI-214	2241.05	1120.23	26.	68.	0.034	58.17	0.983s
K-40	2922.00	1460.49	3.	390.	0.195	15.45	1.923s

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		-1.4605E-03						
			477.56	-1.461E-03	%(	3.700E-01	1.04E-01	G
K-40		9.0583E+00						
			1460.75	9.058E+00	@(	2.567E-01	4.67E-01	G
MN-54		0.0000E+00						
			834.81	0.000E+00	%(	4.440E-02	1.22E-02	G
CO-57		7.3359E-03						
			122.07	7.336E-03	%(P	3.995E-02	1.19E-02	G K
			136.43	-6.345E-02	%	3.731E-01	1.11E-01	G
CO-60		-4.4251E-04						
			1332.51	-4.425E-04	%(P	5.589E-02	1.38E-02	G K
			1173.23	1.052E-02	% P	6.930E-02	1.91E-02	G K
Sr-85		-2.6553E-02						
			514.00	-2.655E-02	%(	6.105E-02	1.84E-02	G
Kr-85		-5.3195E+02						
			513.99	-5.319E+02	%(	1.223E+03	3.69E+02	G
Y-88		7.9293E-03						
			1836.01	7.929E-03	%(P	4.777E-02	1.27E-02	G K
			898.02	1.739E-03	% P	4.922E-02	1.34E-02	G
NB-94		1.2388E-02						
			871.10	1.239E-02	&(	3.753E-02	1.10E-02	G K
			702.50	-2.034E-03	%	3.812E-02	1.06E-02	G K
Ag-108M		-1.0486E-02						
			722.95	-1.049E-02	%(	5.108E-02	1.48E-02	G K
			614.37	-6.856E-03	%	3.862E-02	1.11E-02	G
			433.93	9.280E-03	&	3.476E-02	1.02E-02	G
CD-109		-4.0303E-01						
			88.04	-4.030E-01	%(	1.309E+00	3.94E-01	G
SN-113		9.5269E-04						
			391.71	9.527E-04	&(P	6.363E-02	1.83E-02	G K
			255.04	-2.967E-01	&	1.820E+00	5.38E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-9.1597E-03						
		427.95	-9.160E-03	%(	1.133E-01	3.25E-02	G K
		600.77	-1.098E-03	%	2.085E-01	5.83E-02	G
		636.15	0.000E+00	&	4.468E-01	1.27E-01	G
		463.51	2.096E-01	%	3.438E-01	1.06E-01	G
		176.29	-3.966E-02	&	5.488E-01	1.62E-01	G
I-131	3.5472E-02						
		364.48	3.547E-02	&(	1.291E-01	3.82E-02	G K
		636.97	-1.324E-02	%	1.662E+00	4.63E-01	G
		284.29	-2.082E-01	%	1.690E+00	4.96E-01	G
CS-134	-2.0340E-02						
		604.66	-2.034E-02	%(	5.865E-02	1.75E-02	G K
		795.76	3.264E-02	%	4.804E-02	1.52E-02	G
		569.29	6.854E-02	%	2.002E-01	5.92E-02	G
		801.84	-1.824E-02	%	4.990E-01	1.39E-01	G
CS-137	2.4325E-01						
		661.62	2.432E-01	(	4.419E-02	2.51E-02	G
CE-139	-1.6754E-02						
		165.85	-1.675E-02	%(P	4.924E-02	1.48E-02	G
EU-152	1.9318E-02						
		121.78	1.932E-02	%(	1.215E-01	3.62E-02	G K
		344.30	-3.113E-02	%	1.409E-01	4.17E-02	G
		1408.08	9.723E-02	%	2.344E-01	7.02E-02	G
		964.00	-2.392E-02	%	3.877E-01	1.09E-01	G
		1112.07	0.000E+00	%	5.050E-01	1.41E-01	G
		778.90	1.038E-02	&	2.439E-01	6.58E-02	G
EU-154	1.1393E-02						
		123.10	1.139E-02	&(	9.530E-02	2.84E-02	G K
		1274.80	-3.064E-03	&	1.763E-01	4.86E-02	G
		723.30	-4.200E-02	%	2.282E-01	6.59E-02	G
		1004.80	-3.984E-02	%	2.846E-01	8.05E-02	G
EU-155	2.8754E-02						
		86.45	2.875E-02	%(	1.174E-01	3.51E-02	G K
		105.31	2.810E-02	&	1.639E-01	4.89E-02	G
HG-203	-9.3428E-03						
		279.17	-9.343E-03	%(P	5.045E-02	1.46E-02	G K
		72.87	-2.535E-01	%	1.293E+00	3.88E-01	G
		70.83	-3.895E-01	%	2.302E+00	6.90E-01	G
		82.50	4.601E-01	%	2.694E+00	8.06E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.3227E-01						
		583.14	2.323E-01	(	4.642E-02	2.36E-02	G
		510.72	5.261E-01	+	1.915E-01	8.89E-02	G
PB-212	6.0623E-01						
		238.63	6.009E-01	(	5.406E-02	2.99E-02	G K
							Energy duplication
		77.11	4.942E-01	}	1.995E-01	5.59E-02	G
		74.81	8.110E-01	+	3.692E-01	1.24E-01	G
PB-214	4.4378E-01						
		351.99	4.257E-01	@(	8.389E-02	3.82E-02	G K
		295.22	4.557E-01	(	1.595E-01	6.32E-02	G
							Energy duplication
		77.11	0.000E+00	}	4.767E-01	0.00E+00	G
		241.92	5.032E-01	(	3.335E-01	1.11E-01	G
BI-212	6.8919E-01						
		727.17	6.892E-01	@(	3.335E-01	1.50E-01	G K
		1620.56	1.647E-01	%	1.213E+00	3.14E-01	G
		785.42	6.854E-01	%	1.888E+00	5.60E-01	G
BI-214	4.6935E-01						
		609.32	4.693E-01	*(	8.696E-02	4.59E-02	G K
		1764.51	2.147E-01	%	2.873E-01	9.57E-02	G
		1120.28	8.967E-01	+	3.446E-01	1.74E-01	G
RA-224	6.7670E-01						
		241.00	6.767E-01	%(	1.091E+00	3.34E-01	G
RA-226	1.0788E+00						
		185.99	1.079E+00	*(	1.038E+00	3.26E-01	G
AC-228	6.6663E-01						
		911.07	6.151E-01	(	1.263E-01	7.04E-02	G K
		968.90	8.158E-01	(	3.274E-01	1.57E-01	G
		338.40	5.743E-01	*(	2.851E-01	1.12E-01	G
TH-227	-1.2023E-01						
		236.00	-1.202E-01	%(	3.962E-01	1.19E-01	G K
		256.25	1.220E-01	%	5.117E-01	1.52E-01	G
PA-234	2.0880E-02						
		98.44	2.088E-02	%(	1.553E-01	4.63E-02	G K
		946.00	-2.529E-02	%	2.285E-01	6.40E-02	G
		131.28	-3.467E-02	&	2.001E-01	5.98E-02	G
		94.67	-4.576E-02	%	2.870E-01	8.58E-02	G
		883.24	6.789E-02	%	3.225E-01	9.19E-02	G
		926.70	0.000E+00	&	4.422E-01	1.22E-01	G

Yankee Chemistry Spectrum name: 101F_16DEC2004_1720.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		569.26	1.005E-01	%	2.933E-01	8.67E-02	G
TH-234	8.9810E-01						
		63.29	4.431E-01	&(	1.873E+00	5.61E-01	G K
		92.80	1.138E+00	(	1.413E+00	4.35E-01	G
		92.38	1.309E+00	(	1.668E+00	5.13E-01	G
AM-241	-4.7243E-03						
		59.54	-4.724E-03	%(P	2.425E-01	7.17E-02	G

(- This peak used in the nuclide activity average.

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

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

- -

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

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-1.2293E-03	-1.4605E-03	3.1140E-01	3.1140E-01	3.114E-01
K-40	#	9.0583E+00	9.0583E+00	1.3999E+00	1.4906E+00	
MN-54	#A	0.0000E+00	0.0000E+00	3.6557E-02	3.6557E-02	4.311E-02
CO-57	#B	7.0900E-03	7.3359E-03	3.5700E-02	3.5702E-02	3.861E-02
CO-60	#B	-4.4040E-04	-4.4251E-04	4.4063E-02	4.4063E-02	5.562E-02

Sr-85	#A	-2.3040E-02	-2.6553E-02	5.5297E-02	5.5317E-02	5.298E-02
Kr-85	#A	-5.3190E+02	-5.3195E+02	1.1078E+03	1.1082E+03	1.223E+03
Y-88	#B	7.2735E-03	7.9293E-03	3.8135E-02	3.8137E-02	4.382E-02
NB-94	#B	1.2388E-02	1.2388E-02	3.3048E-02	3.3055E-02	3.753E-02
Ag-108M	#B	-1.0483E-02	-1.0486E-02	4.4458E-02	4.4462E-02	5.107E-02
CD-109	#A	-3.9493E-01	-4.0303E-01	1.1823E+00	1.1825E+00	1.283E+00
SN-113	#B	8.7949E-04	9.5269E-04	5.4779E-02	5.4779E-02	5.874E-02
SB-125	#B	-9.0768E-03	-9.1597E-03	9.7524E-02	9.7525E-02	1.123E-01
I-131	#B	1.1292E-02	3.5472E-02	1.1468E-01	1.1470E-01	4.109E-02
CS-134	#B	-2.0093E-02	-2.0340E-02	5.2581E-02	5.2594E-02	5.793E-02
CS-137		2.4304E-01	2.4325E-01	7.5322E-02	7.6566E-02	
CE-139	#A	-1.5670E-02	-1.6754E-02	4.4819E-02	4.4829E-02	4.606E-02
EU-152	#B	1.9280E-02	1.9318E-02	1.0865E-01	1.0865E-01	1.213E-01
EU-154	#B	1.1359E-02	1.1393E-02	8.5169E-02	8.5172E-02	9.502E-02
EU-155	#B	2.8609E-02	2.8754E-02	1.0544E-01	1.0545E-01	1.168E-01
HG-203	#B	-7.6682E-03	-9.3428E-03	1.1210E-01	1.1210E-01	4.141E-02
TL-208		2.3227E-01	2.3227E-01	7.0945E-02	7.2149E-02	
PB-212		6.0623E-01	6.0623E-01	9.0574E-02	9.6835E-02	
PB-214		4.4378E-01	4.4378E-01	1.1944E-01	1.2204E-01	
BI-212	#	6.8919E-01	6.8919E-01	4.5112E-01	4.5280E-01	
BI-214	#	4.6935E-01	4.6935E-01	1.3783E-01	1.4036E-01	
RA-224	#A	6.7670E-01	6.7670E-01	1.0014E+00	1.0021E+00	1.091E+00
RA-226	#	1.0788E+00	1.0788E+00	9.7707E-01	9.7897E-01	1.038E+00
AC-228		6.6663E-01	6.6663E-01	1.9804E-01	2.0159E-01	
TH-227	#B	-1.2023E-01	-1.2023E-01	3.5682E-01	3.5688E-01	3.962E-01
PA-234	#B	2.0880E-02	2.0880E-02	1.3883E-01	1.3884E-01	1.553E-01
TH-234	#B	8.9810E-01	8.9810E-01	1.0306E+00	1.0318E+00	1.873E+00
AM-241	#A	-4.7241E-03	-4.7243E-03	2.7892E-01	2.7892E-01	2.424E-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) 1.2408838E+01 pCi/gm
Total Decayed Activity (295.1 to 1999.1 keV) 1.2409041E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_16DEC2004_1800.An1

Sample description
Detector 101 FSS_OOL-04-01-009-F-S WET

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_16DEC2004_1800.An1

Acquisition information
Start time: 16-Dec-2004 17:49:22
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: 2.1350E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.1350E+03) =
4.6838E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_16DEC2004_1800.An1

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	03-Dec-2004 07:50:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1047

***** 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
63.79	79.	40.91	1.72	1.151E-02	63.29	3.900	1.147E+00	TH234
74.43	138.	21.30	1.00	1.648E-02				
74.43	138.	21.30	1.00	1.648E-02	74.81	9.600	5.502E-01	PB212
77.11	280.	10.87	1.01	1.725E-02	77.11	17.500	5.888E-01	PB212
					77.11	10.700	9.629E-01	PB214
92.90	124.	32.74	1.50	1.989E-02	92.38	2.570	1.538E+00	TH234
					92.80	3.000	1.315E+00	TH234
92.92	121.	34.20	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.280E+00	TH234
133.57	70.	39.54	1.17	2.101E-02				
133.57	70.	39.54	1.17	2.101E-02	136.43	10.600	2.076E-01	CO57
185.59	106.	24.78	1.82	1.861E-02				
185.59	106.	24.78	1.82	1.861E-02	185.99	3.280	1.105E+00	RA226
209.44	65.	38.45	1.19	1.721E-02				
238.70	546.	5.25	1.12	1.557E-02	238.63	43.100	5.147E-01	PB212
					241.00	3.900	5.734E+00	RA224
241.87	134.	16.38	1.12	1.541E-02				
270.18	56.	39.09	1.41	1.401E-02				
295.35	186.	10.02	1.16	1.292E-02	295.22	19.200	4.751E-01	PB214
299.91	60.	23.01	1.16	1.274E-02				
338.63	132.	14.30	1.45	1.134E-02	338.40	12.010	6.139E-01	AC228
352.00	307.	7.00	1.06	1.092E-02	351.99	37.100	4.797E-01	PB214
510.07	91.	17.69	1.51	7.600E-03	510.72	22.500	3.358E-01	TL208
582.95	166.	11.05	0.94	6.687E-03	583.14	86.000	1.829E-01	TL208
609.24	234.	9.02	1.41	6.414E-03	609.32	46.090	5.011E-01	BI214
727.11	29.	39.66	1.50	5.443E-03	727.17	11.800	PBC<MDA	BI212

910.88	106.	16.73	1.29	4.447E-03	911.07	29.000	5.218E-01	AC228
964.32	32.	25.02	1.61	4.229E-03	964.00	14.580	3.288E-01	EU152
968.89	53.	18.37	1.62	4.212E-03	968.90	17.460	4.566E-01	AC228
1012.33	31.	33.01	0.62	4.054E-03				
1119.69	73.	21.05	1.67	3.713E-03	1120.28	15.040	8.279E-01	BI214
1460.56	601.	4.21	1.69	2.943E-03	1460.75	10.700	1.208E+01	K40
1764.31	27.	22.30	2.11	2.481E-03	1764.51	15.920	4.387E-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	
127.14	63.79	461.	79.	0.040	122.72	1.722	PA-234	l
148.43	74.62	363.	138.	0.069	63.89	1.005	BI-207	D
153.79	77.30	323.	280.	0.140	32.60	1.006	PB-214	D
418.56	209.44	246.	65.	0.033	115.35	1.195	AC-228	M
477.09	238.64	137.	546.	0.273	15.74	1.122	PB-212	D
483.44	241.81	176.	134.	0.067	49.15	1.124	PB-214	D
540.08	270.18	172.	56.	0.028	117.27	1.408	AC-228	s
599.34	299.79	78.	54.	0.027	79.49	0.830	TH-227	
1929.11	964.37	16.	32.	0.016	73.70	1.613	AC-228	D
2025.12	1012.33	17.	35.	0.017	71.62	0.620	-	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	74.61	923.	121.	0.061	109.92	1.499s
PB-212	153.79	77.11	879.	235.	0.118	56.96	1.499D
PB-214	153.79	77.11	879.	235.	0.118	56.96	1.499D
TH-234	185.41	92.92	791.	121.	0.060	102.59	1.499s
TH-234	185.39	92.90	762.	124.	0.062	98.22	1.499s
RA-226	371.34	185.84	383.	93.	0.046	94.96	1.499s
PB-212	476.96	238.63	365.	468.	0.234	22.17	1.499D
PB-214	590.22	295.23	173.	160.	0.080	42.26	1.499
AC-228	677.03	338.63	94.	132.	0.066	42.90	1.445s
PB-214	703.78	351.99	88.	299.	0.150	21.86	1.499D
TL-208	1020.08	510.07	59.	91.	0.045	53.08	1.505s
TL-208	1165.92	582.95	59.	166.	0.083	33.15	0.941
BI-214	1218.51	609.24	66.	234.	0.117	27.05	1.410
BI-212	1454.37	727.11	51.	29.	0.014	118.99	1.499
AC-228	1822.11	910.88	57.	106.	0.053	50.18	1.286
AC-228	1938.21	968.90	21.	53.	0.027	54.94	1.616D
BI-214	2239.96	1119.69	48.	73.	0.036	63.16	1.675s
K-40	2922.13	1460.56	9.	601.	0.300	12.62	1.688
BI-214	3530.05	1764.31	5.	27.	0.014	66.89	2.106

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

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

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-3.0815E-02					
			477.56	-3.082E-02	%(	3.859E-01 1.11E-01	G
K-40		1.2076E+01					
			1460.75	1.208E+01	(	3.402E-01 5.08E-01	G
MN-54		5.6864E-04					
			834.81	5.686E-04	%(	4.174E-02 1.16E-02	G
CO-57		2.8913E-03					
			122.07	2.891E-03	%(P	4.150E-02 1.23E-02	G K
			136.43	-9.863E-03	%	3.284E-01 9.74E-02	G
CO-60		-1.2773E-02					
			1332.51	-1.277E-02	%(P	5.632E-02 1.37E-02	G K
			1173.23	-1.233E-02	% P	7.572E-02 2.05E-02	G K
Sr-85		-2.9915E-02					
			514.00	-2.992E-02	%(	5.306E-02 1.62E-02	G
Kr-85		-5.9836E+02					
			513.99	-5.984E+02	%(	1.061E+03 3.25E+02	G
Y-88		-1.0200E-02					
			1836.01	-1.020E-02	%(P	6.178E-02 1.71E-02	G K
			898.02	-1.208E-02	% P	5.276E-02 1.51E-02	G
NB-94		1.5075E-03					
			871.10	1.507E-03	%(	4.346E-02 1.21E-02	G K
			702.50	-5.823E-03	%	4.152E-02 1.20E-02	G K
Ag-108M		-7.1140E-03					
			722.95	-7.114E-03	&(	5.277E-02 1.53E-02	G K
			614.37	-1.045E-02	%	4.618E-02 1.35E-02	G
			433.93	1.222E-02	%	3.312E-02 9.90E-03	G
CD-109		-3.3159E-01					
			88.04	-3.316E-01	%(	1.306E+00 3.93E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	-1.4515E-02						
		391.71	-1.452E-02	%(P	6.425E-02	1.89E-02	G K
		255.04	3.255E-01	&	1.751E+00	5.20E-01	G
SB-125	4.5158E-02						
		427.95	4.516E-02	%(	1.092E-01	3.29E-02	G K
		600.77	0.000E+00	%	2.142E-01	6.06E-02	G
		636.15	7.085E-02	&	3.242E-01	9.43E-02	G
		463.51	6.948E-02	&	3.346E-01	9.80E-02	G
		176.29	-2.303E-02	%	5.008E-01	1.48E-01	G
I-131	2.2114E-02						
		364.48	2.211E-02	&(	1.255E-01	3.69E-02	G K
		636.97	1.948E-01	%	1.463E+00	4.18E-01	G
		284.29	-1.097E-01	&	1.735E+00	5.09E-01	G
CS-134	-2.5089E-03						
		604.66	-2.509E-03	%(	4.686E-02	1.35E-02	G K
		795.76	-9.717E-03	%	4.953E-02	1.43E-02	G
		569.29	7.895E-02	%	1.844E-01	5.55E-02	G
		801.84	2.573E-02	&	4.680E-01	1.31E-01	G
CS-137	4.0783E-03						
		661.62	4.078E-03	&(	4.535E-02	1.29E-02	G
CE-139	-5.4628E-03						
		165.85	-5.463E-03	%(P	4.611E-02	1.37E-02	G
EU-152	-3.5529E-03						
		121.78	-3.553E-03	%(	1.103E-01	3.27E-02	G K
		344.30	5.761E-03	&	1.210E-01	3.52E-02	G
		1408.08	4.549E-02	%	1.860E-01	5.28E-02	G
		964.00	2.521E-01	%	3.380E-01	1.07E-01	G
		1112.07	4.252E-02	%	3.566E-01	1.01E-01	G
		778.90	-3.857E-02	%	2.925E-01	8.32E-02	G
EU-154	1.3590E-02						
		123.10	1.359E-02	&(	8.722E-02	2.61E-02	G K
		1274.80	-4.777E-03	%	1.596E-01	4.43E-02	G
		723.30	-4.415E-02	&	2.518E-01	7.34E-02	G
		1004.80	-7.522E-02	%	2.574E-01	7.54E-02	G
EU-155	5.0791E-02						
		86.45	5.079E-02	%(	1.209E-01	3.66E-02	G K
		105.31	7.554E-02	%	1.725E-01	5.22E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	-1.2307E-02						
		279.17	-1.231E-02	%(P	5.241E-02	1.54E-02	G K
		72.87	-3.139E-02	%	1.113E+00	3.32E-01	G
		70.83	3.091E-02	&	2.458E+00	7.34E-01	G
		82.50	-8.862E-01	%	2.574E+00	7.76E-01	G
TL-208	1.8288E-01						
		583.14	1.829E-01	(	4.236E-02	2.02E-02	G
		510.72	3.358E-01	+	1.431E-01	5.93E-02	G
PB-212	4.6029E-01						
							Energy duplication
		238.63	4.415E-01	(	8.648E-02	3.26E-02	G K
							Energy duplication
		77.11	4.943E-01	(	2.961E-01	9.38E-02	G
		74.81	4.826E-01	?(	5.753E-01	1.77E-01	G
PB-214	4.4670E-01						
							Energy duplication
		351.99	4.672E-01	(	7.252E-02	3.40E-02	G K
		295.22	4.070E-01	(	1.632E-01	5.73E-02	G
							Energy duplication
		77.11	8.084E-01	+	4.843E-01	1.53E-01	G
		241.92	-3.051E-01	%	6.017E-01	1.83E-01	G
BI-212	2.8418E-01						
		727.17	2.842E-01	(	3.546E-01	1.13E-01	G K
		1620.56	2.377E-02	&	1.255E+00	3.14E-01	G
		785.42	8.945E-01	&	1.759E+00	5.37E-01	G
BI-214	4.8509E-01						
		609.32	5.011E-01	(	8.688E-02	4.52E-02	G K
		1764.51	4.387E-01	?(	2.094E-01	9.78E-02	G
		1120.28	8.279E-01	+	3.969E-01	1.74E-01	G
RA-224	1.2835E-02						
		241.00	1.283E-02	%(	6.692E-01	1.95E-01	G
RA-226	9.6123E-01						
		185.99	9.612E-01	*(	9.751E-01	3.04E-01	G
AC-228	5.2154E-01						
		911.07	5.218E-01	(	1.855E-01	8.73E-02	G K
		968.90	4.576E-01	(	2.064E-01	8.38E-02	G
		338.40	6.139E-01	(	2.222E-01	8.78E-02	G
TH-227	-1.2718E-01						
		236.00	-1.272E-01	%(	4.116E-01	1.24E-01	G K
		256.25	1.044E-01	&	4.630E-01	1.38E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-234	-1.9095E-03						
		98.44	-1.910E-03	%(	1.288E-01	3.81E-02	G K
		946.00	-4.139E-03	%	2.345E-01	6.53E-02	G
		131.28	-6.964E-02	%	1.888E-01	5.70E-02	G
		94.67	-1.103E-01	%	2.794E-01	8.45E-02	G
		883.24	6.564E-02	&	2.678E-01	7.69E-02	G
		926.70	-9.501E-02	%	4.125E-01	1.20E-01	G
		569.26	1.157E-01	%	2.702E-01	8.13E-02	G
TH-234	1.3214E+00						
		63.29	1.211E+00	%(	1.916E+00	5.85E-01	G K
		92.80	1.315E+00	*(	1.393E+00	4.30E-01	G
		92.38	1.498E+00	*(	1.660E+00	5.12E-01	G
AM-241	1.8726E-02						
		59.54	1.873E-02	&(P	2.406E-01	7.16E-02	G

(- This peak used in the nuclide activity average.

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

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

- -

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

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-2.5890E-02	-3.0815E-02	3.3285E-01	3.3285E-01	3.242E-01
K-40		1.2076E+01	1.2076E+01	1.5244E+00	1.6701E+00	
MN-54	#A	5.5195E-04	5.6864E-04	3.4752E-02	3.4752E-02	4.051E-02
CO-57	#B	2.7934E-03	2.8913E-03	3.6994E-02	3.6995E-02	4.009E-02
CO-60	#B	-1.2711E-02	-1.2773E-02	7.8092E+00	7.8092E+00	5.605E-02
Sr-85	#A	-2.5918E-02	-2.9915E-02	4.8682E-02	4.8711E-02	4.597E-02
Kr-85	#A	-5.9830E+02	-5.9836E+02	9.7378E+02	9.7436E+02	1.061E+03
Y-88	#B	-9.3477E-03	-1.0200E-02	5.8912E-02	5.8915E-02	5.662E-02
NB-94	#B	1.5075E-03	1.5075E-03	3.6446E-02	3.6446E-02	4.346E-02
Ag-108M	#B	-7.1126E-03	-7.1140E-03	4.5793E-02	4.5795E-02	5.276E-02
CD-109	#A	-3.2486E-01	-3.3159E-01	1.1784E+00	1.1785E+00	1.279E+00
SN-113	#B	-1.3388E-02	-1.4515E-02	6.7938E-02	6.7943E-02	5.926E-02
SB-125	#B	4.4745E-02	4.5158E-02	9.8556E-02	9.8589E-02	1.082E-01
I-131	#B	6.9557E-03	2.2114E-02	1.1061E-01	1.1062E-01	3.948E-02
CS-134	#B	-2.4781E-03	-2.5089E-03	4.0444E-02	4.0444E-02	4.629E-02
CS-137	#A	4.0748E-03	4.0783E-03	3.8780E-02	3.8780E-02	4.531E-02
CE-139	#A	-5.1055E-03	-5.4628E-03	4.2084E-02	4.2085E-02	4.309E-02
EU-152	#B	-3.5458E-03	-3.5529E-03	9.8080E-02	9.8080E-02	1.101E-01
EU-154	#B	1.3550E-02	1.3590E-02	7.8164E-02	7.8167E-02	8.696E-02
EU-155	#B	5.0531E-02	5.0791E-02	1.0968E-01	1.0972E-01	1.203E-01
HG-203	#B	-1.0081E-02	-1.2307E-02	8.3569E-02	8.3572E-02	4.292E-02
TL-208		1.8288E-01	1.8288E-01	6.0629E-02	6.1504E-02	
PB-212	#	4.6029E-01	4.6029E-01	1.0207E-01	1.0533E-01	8.648E-02
PB-214	#	4.4670E-01	4.4670E-01	9.7653E-02	1.0086E-01	7.252E-02
BI-212	#A	2.8418E-01	2.8418E-01	3.3814E-01	3.3852E-01	3.546E-01
BI-214		4.8509E-01	4.8509E-01	1.3122E-01	1.3405E-01	
RA-224	A	1.2835E-02	1.2835E-02	5.8436E-01	5.8436E-01	6.692E-01
RA-226	#A	9.6121E-01	9.6123E-01	9.1279E-01	9.1440E-01	9.751E-01
AC-228		5.2154E-01	5.2154E-01	1.4931E-01	1.5219E-01	
TH-227	#B	-1.2718E-01	-1.2718E-01	3.7147E-01	3.7154E-01	4.116E-01
PA-234	#B	-1.9095E-03	-1.9095E-03	1.1430E-01	1.1430E-01	1.288E-01
TH-234	#B	1.3214E+00	1.3214E+00	8.9384E-01	8.9684E-01	1.916E+00
AM-241	#A	1.8724E-02	1.8726E-02	2.1482E-01	2.1483E-01	2.406E-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

Yankee Chemistry Spectrum name: 101F_16DEC2004_1800.An1

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

Total Activity (1012.3 to 1999.1 keV) 1.3265802E+01 pCi/gm
Total Decayed Activity (1012.3 to 1999.1 keV) 1.3265802E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_16DEC2004_1835.An1

Sample description
Detector 101 FSS_OOL-04-01-007-F-S WET

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_16DEC2004_1835.An1

Acquisition information
Start time: 16-Dec-2004 18:26:36
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: 1.7380E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7380E+03) = 5.7537E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_16DEC2004_1835.An1

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	06-Dec-2004 11:38:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1661

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.78	105.	40.26	1.50	1.654E-02	72.87	6.400	9.327E-01	HG203
					74.81	9.600	5.128E-01	PB212
77.16	206.	19.43	1.50	1.720E-02	77.11	10.700	8.684E-01	PB214
					77.11	17.500	5.310E-01	PB212
77.16	206.	19.43	1.50	1.720E-02	77.11	10.700	8.684E-01	PB214
					77.11	17.500	5.310E-01	PB212
92.56	120.	32.53	1.85	1.987E-02	92.38	2.570	1.821E+00	TH234
					92.80	3.000	1.557E+00	TH234
185.96	99.	21.40	1.16	1.858E-02				
185.96	99.	21.40	1.16	1.858E-02	185.99	3.280	1.263E+00	RA226
209.60	86.	28.64	1.02	1.720E-02				
238.70	565.	4.89	1.12	1.557E-02	238.63	43.100	6.542E-01	PB212
242.15	79.	23.22	1.12	1.539E-02	241.00	3.900	1.015E+00	RA224
270.13	64.	31.39	1.89	1.401E-02				
295.08	116.	15.22	0.97	1.293E-02				
295.08	116.	15.22	0.97	1.293E-02	295.22	19.200	3.623E-01	PB214
327.54	50.	38.56	0.76	1.171E-02				
338.63	104.	17.42	1.20	1.134E-02	338.40	12.010	5.944E-01	AC228
352.08	216.	9.50	1.00	1.092E-02	351.99	37.100	4.153E-01	PB214
510.21	88.	18.08	1.13	7.598E-03	510.72	22.500	3.984E-01	TL208
582.99	153.	9.86	1.18	6.686E-03	583.14	86.000	2.072E-01	TL208
609.15	172.	10.72	1.27	6.414E-03	609.32	46.090	4.530E-01	BI214
727.16	75.	22.31	2.45	5.443E-03	727.17	11.800	9.055E-01	BI212
911.04	86.	16.36	1.52	4.447E-03				
911.04	86.	16.36	1.52	4.447E-03	911.07	29.000	5.216E-01	AC228
968.74	82.	16.76	1.67	4.213E-03				

968.74	82.	16.76	1.67	4.213E-03	968.90	17.460	8.648E-01	AC228
1120.02	46.	31.17	1.68	3.711E-03	1120.28	15.040	6.409E-01	BI214
1460.56	472.	4.69	1.65	2.943E-03	1460.75	10.700	1.166E+01	K40
1763.93	28.	18.90	1.13	2.481E-03	1764.51	15.920	5.511E-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	209.60	217.	86.	0.043	85.93	1.017	NP-239 s
539.99	270.13	134.	64.	0.032	94.16	1.892	AC-228 s
654.86	327.54	121.	50.	0.025	115.68	0.764	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	149.13	74.78	836.	105.	0.052	120.77	1.499
PB-214	153.79	77.11	695.	206.	0.103	58.29	1.499D
PB-212	153.79	77.11	695.	206.	0.103	58.29	1.499D
TH-234	185.40	92.91	652.	105.	0.052	107.67	1.499s
TH-234	185.39	92.90	632.	107.	0.053	103.83	1.499s
RA-226	371.75	186.05	301.	101.	0.051	78.73	1.499
PB-212	477.09	238.70	270.	482.	0.241	19.91	1.499
RA-224	483.14	241.72	343.	71.	0.036	116.20	1.499
PB-214	590.17	295.21	123.	127.	0.064	45.55	1.499s
AC-228	676.70	338.46	98.	89.	0.044	56.98	1.499
PB-214	703.78	351.99	65.	191.	0.096	28.14	1.499
TL-208	1020.36	510.21	52.	88.	0.044	54.24	1.129s
TL-208	1165.99	582.99	29.	153.	0.077	29.57	1.180s
BI-214	1218.33	609.15	47.	172.	0.086	32.16	1.274
BI-212	1454.47	727.16	52.	75.	0.037	66.92	2.449s
AC-228	1822.22	910.94	36.	63.	0.032	55.17	1.578s
AC-228	1938.17	968.88	27.	57.	0.028	55.43	1.616
BI-214	2240.62	1120.02	42.	46.	0.023	93.51	1.684s
K-40	2922.14	1460.56	5.	472.	0.236	14.06	1.651
BI-214	3529.29	1763.93	0.	28.	0.014	56.69	1.133s

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		1.3450E-01					
			477.56	1.345E-01	%(	3.445E-01	1.03E-01 G
K-40		1.1656E+01					
			1460.75	1.166E+01	(	3.243E-01	5.46E-01 G
MN-54		1.7462E-02					
			834.81	1.746E-02	%(	4.496E-02	1.34E-02 G
CO-57		-6.8604E-04					
			122.07	-6.860E-04	%(P	4.179E-02	1.23E-02 G K
			136.43	-6.232E-02	%	3.943E-01	1.18E-01 G
CO-60		4.8966E-03					
			1332.51	4.897E-03	&(P	5.441E-02	1.35E-02 G K
			1173.23	-1.009E-02	% P	6.205E-02	1.53E-02 G K
Sr-85		-2.6538E-02					
			514.00	-2.654E-02	&(	5.981E-02	1.81E-02 G
Kr-85		-5.4897E+02					
			513.99	-5.490E+02	&(	1.237E+03	3.74E+02 G
Y-88		4.8083E-03					
			1836.01	4.808E-03	%(P	3.942E-02	9.82E-03 G K
			898.02	1.305E-02	% P	5.574E-02	1.60E-02 G
NB-94		1.1697E-02					
			871.10	1.170E-02	%(	4.771E-02	1.38E-02 G K
			702.50	2.374E-03	%	4.530E-02	1.27E-02 G K
Ag-108M		-1.8609E-02					
			722.95	-1.861E-02	&(	6.080E-02	1.80E-02 G K
			614.37	-3.088E-03	%	3.943E-02	1.10E-02 G
			433.93	-4.224E-04	%	3.342E-02	9.36E-03 G
CD-109		-4.4301E-01					
			88.04	-4.430E-01	%(	1.489E+00	4.48E-01 G
SN-113		-1.5534E-02					
			391.71	-1.553E-02	%(P	6.557E-02	1.92E-02 G K
			255.04	-1.330E-01	&	2.011E+00	5.91E-01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	4.6796E-02						
		427.95	4.680E-02	&(	1.140E-01	3.43E-02	G K
		600.77	-1.331E-02	%	1.910E-01	5.34E-02	G
		636.15	-5.422E-03	&	3.631E-01	1.01E-01	G
		463.51	1.901E-01	%	4.009E-01	1.22E-01	G
		176.29	1.218E-01	&	5.535E-01	1.65E-01	G
I-131	-2.5454E-04						
		364.48	-2.545E-04	%(	1.037E-01	2.97E-02	G K
		636.97	4.156E-01	&	1.241E+00	3.67E-01	G
		284.29	3.489E-01	%	1.220E+00	3.63E-01	G
CS-134	-7.1654E-03						
		604.66	-7.165E-03	%(	4.626E-02	1.34E-02	G K
		795.76	-7.913E-03	%	5.343E-02	1.52E-02	G
		569.29	0.000E+00	%	2.512E-01	7.01E-02	G
		801.84	-7.478E-02	%	5.268E-01	1.50E-01	G
CS-137	3.8695E-02						
		661.62	3.869E-02	%(	5.438E-02	1.71E-02	G
CE-139	-1.3030E-02						
		165.85	-1.303E-02	&(P	4.869E-02	1.46E-02	G
EU-152	-2.0537E-03						
		121.78	-2.054E-03	&(	1.097E-01	3.23E-02	G K
		344.30	-6.579E-05	&	1.149E-01	3.27E-02	G
		1408.08	6.378E-03	%	1.820E-01	4.61E-02	G
		964.00	-1.260E-01	%	4.334E-01	1.28E-01	G
		1112.07	9.439E-03	&	4.277E-01	1.18E-01	G
		778.90	2.860E-05	%	3.509E-01	9.68E-02	G
EU-154	-1.3776E-02						
		123.10	-1.378E-02	%(	9.854E-02	2.94E-02	G K
		1274.80	-9.150E-03	&	1.798E-01	4.97E-02	G
		723.30	4.412E-02	&	1.267E-01	3.71E-02	G
		1004.80	-2.448E-03	&	3.242E-01	8.96E-02	G
EU-155	1.3291E-02						
		86.45	1.329E-02	%(	1.650E-01	4.92E-02	G K
		105.31	1.359E-02	&	1.833E-01	5.44E-02	G
HG-203	4.3302E-03						
		279.17	4.330E-03	%(P	5.199E-02	1.51E-02	G K
		72.87	-1.665E-01	%	1.301E+00	3.90E-01	G
		70.83	-3.165E-01	%	2.165E+00	6.47E-01	G
		82.50	-2.783E-01	&	2.719E+00	8.11E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.0721E-01						
		583.14	2.072E-01	@(	3.749E-02	2.04E-02	G
		510.72	3.984E-01	+	1.661E-01	7.20E-02	G
PB-212	5.4494E-01						
		238.63	5.578E-01	(	9.185E-02	3.70E-02	G K
							Energy duplication
		77.11	5.310E-01	(	3.243E-01	1.03E-01	G
		74.81	5.128E-01	&(	6.732E-01	2.06E-01	G
PB-214	3.7745E-01						
		351.99	3.666E-01	(	7.735E-02	3.44E-02	G K
		295.22	3.984E-01	@(	1.703E-01	6.05E-02	G
							Energy duplication
		77.11	8.684E-01	+	5.304E-01	1.69E-01	G
		241.92	4.819E-02	%	4.692E-01	1.38E-01	G
BI-212	9.0553E-01						
		727.17	9.055E-01	*(	4.404E-01	2.02E-01	G K
		1620.56	1.516E-01	%	1.780E+00	4.71E-01	G
		785.42	9.408E-01	%	1.912E+00	5.83E-01	G
BI-214	4.7820E-01						
		609.32	4.530E-01	(	9.099E-02	4.85E-02	G K
		1764.51	5.511E-01	(	1.451E-01	1.04E-01	G
		1120.28	6.409E-01	+	4.585E-01	2.00E-01	G
RA-224	9.1687E-01						
		241.00	9.169E-01	(	1.149E+00	3.55E-01	G
RA-226	1.2897E+00						
		185.99	1.290E+00	(	1.067E+00	3.38E-01	G
AC-228	4.7299E-01						
		911.07	3.822E-01	(	1.855E-01	7.03E-02	G K
		968.90	6.010E-01	(	2.834E-01	1.11E-01	G
		338.40	5.061E-01	(	2.781E-01	9.61E-02	G
TH-227	-1.3006E-01						
		236.00	-1.301E-01	&(	4.135E-01	1.24E-01	G K
		256.25	0.000E+00	%	5.824E-01	1.70E-01	G
PA-234	-1.2431E-02						
		98.44	-1.243E-02	%(	1.725E-01	5.13E-02	G K
		946.00	5.818E-02	%	2.480E-01	7.16E-02	G
		131.28	7.860E-03	&	2.040E-01	6.05E-02	G
		94.67	-7.883E-02	&	3.168E-01	9.51E-02	G
		883.24	-4.801E-02	%	3.265E-01	9.12E-02	G
		926.70	2.215E-02	%	3.795E-01	1.04E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 0.000E+00 %   3.691E-01 1.03E-01 G

TH-234       1.0630E+00
                           63.29 4.592E-01 %(  2.203E+00 6.60E-01 G K
                           92.80 1.393E+00  (  1.561E+00 4.82E-01 G
                           92.38 1.594E+00  (  1.854E+00 5.72E-01 G

AM-241      -2.7653E-03
                           59.54-2.765E-03 %(P 2.735E-01 8.10E-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	1.1769E-01	1.3450E-01	3.0898E-01	3.0907E-01	3.014E-01
K-40		1.1656E+01	1.1656E+01	1.6392E+00	1.7665E+00	
MN-54	#A	1.7067E-02	1.7462E-02	4.0228E-02	4.0240E-02	4.395E-02
CO-57	#B	-6.6816E-04	-6.8604E-04	4.5008E-01	4.5008E-01	4.070E-02
CO-60	#B	4.8785E-03	4.8966E-03	4.0634E-02	4.0635E-02	5.421E-02

Sr-85	#A	-2.3775E-02	-2.6538E-02	5.4212E-02	5.4232E-02	5.359E-02
Kr-85	#A	-5.4893E+02	-5.4897E+02	1.1213E+03	1.1218E+03	1.237E+03
Y-88	#B	4.4973E-03	4.8083E-03	2.9452E-02	2.9453E-02	3.687E-02
NB-94	#B	1.1697E-02	1.1697E-02	4.1480E-02	4.1486E-02	4.771E-02
Ag-108M	#B	-1.8606E-02	-1.8609E-02	5.3977E-02	5.3987E-02	6.079E-02
CD-109	#A	-4.3610E-01	-4.4301E-01	1.3450E+00	1.3453E+00	1.466E+00
SN-113	#B	-1.4601E-02	-1.5534E-02	7.0556E-02	7.0561E-02	6.164E-02
SB-125	#B	4.6468E-02	4.6796E-02	1.0278E-01	1.0281E-01	1.132E-01
I-131	#B	-1.0489E-04	-2.5454E-04	8.9058E-02	8.9058E-02	4.275E-02
CS-134	#B	-7.0979E-03	-7.1654E-03	4.0057E-02	4.0059E-02	4.582E-02
CS-137	#A	3.8669E-02	3.8695E-02	5.1250E-02	5.1297E-02	5.434E-02
CE-139	#A	-1.2372E-02	-1.3030E-02	4.4231E-02	4.4237E-02	4.623E-02
EU-152	#B	-2.0506E-03	-2.0537E-03	9.6890E-02	9.6890E-02	1.095E-01
EU-154	#B	-1.3744E-02	-1.3776E-02	8.8107E-02	8.8110E-02	9.831E-02
EU-155	#B	1.3239E-02	1.3291E-02	1.4761E-01	1.4761E-01	1.643E-01
HG-203	#B	3.7159E-03	4.3302E-03	4.5329E-02	4.5330E-02	4.461E-02
TL-208	#	2.0721E-01	2.0721E-01	6.1280E-02	6.2388E-02	
PB-212	#	5.4494E-01	5.4494E-01	1.0852E-01	1.1280E-01	9.185E-02
PB-214	#	3.7745E-01	3.7745E-01	1.0105E-01	1.0327E-01	7.735E-02
BI-212	#	9.0553E-01	9.0553E-01	6.0596E-01	6.0812E-01	
BI-214		4.7820E-01	4.7820E-01	1.5377E-01	1.5612E-01	
RA-224	#A	9.1687E-01	9.1687E-01	1.0654E+00	1.0667E+00	1.149E+00
RA-226	#	1.2897E+00	1.2897E+00	1.0154E+00	1.0180E+00	1.067E+00
AC-228	#	4.7299E-01	4.7299E-01	1.5256E-01	1.5488E-01	1.855E-01
TH-227	#B	-1.3006E-01	-1.3006E-01	3.7261E-01	3.7268E-01	4.135E-01
PA-234	#B	-1.2431E-02	-1.2431E-02	1.5389E-01	1.5389E-01	1.725E-01
TH-234	#B	1.0630E+00	1.0630E+00	1.1037E+00	1.1052E+00	2.203E+00
AM-241	#A	-2.7652E-03	-2.7653E-03	3.9185E-01	3.9185E-01	2.735E-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) 1.3247381E+01 pCi/gm
Total Decayed Activity (50.2 to 1999.1 keV) 1.3247381E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_16DEC2004_1945.An1

Sample description
Detector 101 FSS_OOL-04-01-011-F-R WET

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_16DEC2004_1945.An1

Acquisition information

Start time:	16-Dec-2004 19:39:35
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:	2.0250E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 2.0250E+03) = 4.9383E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_16DEC2004_1945.An1

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	15-Dec-2004 13:22:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1730

***** 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
74.58	156.	19.20	1.00	1.651E-02				
74.58	156.	19.20	1.00	1.651E-02	74.81	9.600	6.572E-01	PB212
77.03	323.	9.47	1.01	1.722E-02	77.11	10.700	1.171E+00	PB214
					77.11	17.500	7.158E-01	PB212
93.31	126.	22.61	1.15	1.995E-02	92.38	2.570	1.652E+00	TH234
					92.80	3.000	1.412E+00	TH234
185.94	128.	20.87	1.07	1.859E-02				
185.94	128.	20.87	1.07	1.859E-02	185.99	3.280	1.399E+00	RA226
209.41	62.	36.24	1.40	1.721E-02				
238.70	607.	4.89	1.12	1.557E-02				
238.70	607.	4.89	1.12	1.557E-02	238.63	43.100	6.030E-01	PB212
241.20	97.	27.98	1.12	1.544E-02	241.00	3.900	1.073E+00	RA224
246.29	59.	31.16	1.50	1.540E-02	241.92	7.470	3.437E-01	PB214
269.76	104.	25.55	1.45	1.403E-02				
277.65	42.	39.04	1.50	1.360E-02	279.17	81.500	PBC<MDA	HG203
295.37	106.	16.98	0.86	1.291E-02	295.22	19.200	2.852E-01	PB214
300.31	52.	34.54	1.43	1.272E-02				
338.40	129.	15.77	1.13	1.135E-02	338.40	12.010	6.315E-01	AC228
351.87	247.	10.83	1.18	1.093E-02				
351.87	247.	10.83	1.18	1.093E-02	351.99	37.100	4.073E-01	PB214
409.02	33.	36.15	1.12	9.430E-03				
462.84	38.	38.30	1.52	8.353E-03				
462.84	38.	38.30	1.52	8.353E-03	463.51	10.000	3.003E-01	SB125
510.66	83.	17.31	1.33	7.591E-03	510.72	22.500	3.251E-01	TL208
582.98	176.	10.26	1.43	6.686E-03	583.14	86.000	2.043E-01	TL208
609.00	180.	11.78	1.33	6.416E-03	609.32	46.090	4.066E-01	BI214

661.48	65.	18.04	1.51	5.939E-03	661.62	84.620	8.581E-02	CS137
726.98	56.	29.43	1.26	5.444E-03	727.17	11.800	5.777E-01	BI212
910.94	112.	13.15	1.35	4.447E-03	911.07	29.000	5.796E-01	AC228
964.61	32.	26.15	1.61	4.228E-03	964.00	14.580	3.462E-01	EU152
968.66	65.	14.75	1.62	4.213E-03	968.90	17.460	5.925E-01	AC228
1120.05	91.	16.50	1.53	3.711E-03	1120.28	15.040	1.088E+00	BI214
1460.43	449.	4.79	1.85	2.943E-03	1460.75	10.700	9.515E+00	K40
1763.83	26.	19.61	1.37	2.481E-03	1764.51	15.920	4.392E-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	
148.72	74.72	373.	156.	0.078	57.61	1.005	BI-207	D
153.63	77.17	306.	323.	0.161	28.41	1.006	PB-214	D
418.48	209.41	210.	62.	0.031	108.71	1.405	AC-228	s
477.10	238.63	137.	607.	0.303	14.67	1.122	PB-212	D
482.09	241.12	319.	97.	0.048	83.93	1.123	RA-224	D
539.25	269.76	207.	104.	0.052	76.64	1.454	AC-228	s
600.38	300.31	120.	52.	0.026	103.61	1.429	PB-212	s
817.89	409.02	53.	33.	0.017	108.46	1.118	CS-138	
925.58	462.84	68.	38.	0.019	114.89	1.517	CS-138	l
1929.33	964.68	18.	33.	0.016	76.53	1.613	AC-228	D

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

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.91	74.67	882.	124.	0.062	104.94	1.499
PB-214	153.79	77.11	797.	247.	0.123	52.18	1.499D
PB-212	153.79	77.11	797.	247.	0.123	52.18	1.499D
TH-234	185.75	93.09	744.	143.	0.071	84.81	1.499
TH-234	185.74	93.08	703.	169.	0.085	70.43	1.499
RA-226	371.18	185.76	375.	111.	0.055	79.58	1.499s
PB-212	476.96	238.63	305.	494.	0.247	20.17	1.499D
RA-224	482.58	241.44	405.	78.	0.039	114.81	1.499
PB-214	492.29	246.29	141.	59.	0.030	93.47	1.499s
PB-214	590.35	295.30	169.	101.	0.050	62.38	1.499
AC-228	676.58	338.40	114.	129.	0.064	47.32	1.131s
PB-214	703.56	351.88	105.	211.	0.105	29.20	1.499
TL-208	1021.26	510.66	52.	83.	0.042	51.94	1.329s
TL-208	1165.97	582.98	50.	176.	0.088	30.78	1.431s
BI-214	1218.04	609.00	73.	180.	0.090	35.33	1.332
CS-137	1323.05	661.48	32.	65.	0.032	54.13	1.511
BI-212	1454.11	726.98	62.	56.	0.028	88.29	1.263s
AC-228	1822.22	910.94	30.	112.	0.056	39.46	1.347
AC-228	1938.21	968.90	17.	65.	0.033	45.58	1.616D
BI-214	2240.70	1120.05	32.	91.	0.045	49.49	1.532

Yankee Chemistry Spectrum name: 101F_16DEC2004_1945.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
K-40	2921.87	1460.43	3.	449.	0.224	14.36	1.855
BI-214	3529.09	1763.83	0.	26.	0.013	58.83	1.374s

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		-2.9500E-02					
			477.56	-2.950E-02	&(	3.783E-01 1.09E-01	G
K-40		9.5148E+00					
			1460.75	9.515E+00	(	2.313E-01 4.55E-01	G
MN-54		-3.5466E-03					
			834.81	-3.547E-03	%(	4.230E-02 1.19E-02	G
CO-57		1.7467E-03					
			122.07	1.747E-03	&(P	4.352E-02 1.29E-02	G K
			136.43	5.018E-02	%	3.517E-01 1.05E-01	G
CO-60		-1.2851E-02					
			1332.51	-1.285E-02	&(P	5.339E-02 1.24E-02	G K
			1173.23	-1.098E-02	& P	6.725E-02 1.76E-02	G K
Sr-85		-9.9135E-03					
			514.00	-9.914E-03	%(	4.386E-02 1.29E-02	G
Kr-85		-2.2801E+02					
			513.99	-2.280E+02	%(	9.993E+02 2.94E+02	G
Y-88		-7.2127E-03					
			1836.01	-7.213E-03	%(P	4.542E-02 1.21E-02	G K
			898.02	-9.916E-03	% P	4.506E-02 1.28E-02	G
NB-94		1.8544E-03					
			871.10	1.854E-03	%(	3.770E-02 1.04E-02	G K
			702.50	1.112E-03	%	4.316E-02 1.22E-02	G K
Ag-108M		-2.5355E-02					
			722.95	-2.535E-02	%(	6.426E-02 1.93E-02	G K
			614.37	-2.993E-03	%	4.202E-02 1.19E-02	G
			433.93	-4.139E-04	%	3.829E-02 1.09E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	1.7088E-01						
		88.04	1.709E-01	%(	1.248E+00	3.73E-01	G
SN-113	2.0968E-02						
		391.71	2.097E-02	&(P	5.205E-02	1.56E-02	G K Energy duplication
		255.04	6.564E-01	%	1.437E+00	4.35E-01	G
SB-125	6.6540E-03						
		427.95	6.654E-03	%(	9.336E-02	2.66E-02	G K
		600.77	-3.297E-02	&	2.012E-01	5.81E-02	G
		636.15	4.761E-03	%	3.254E-01	9.11E-02	G
		463.51	2.443E-01	%	3.282E-01	1.03E-01	G
		176.29	4.068E-03	&	5.156E-01	1.52E-01	G
I-131	5.2673E-03						
		364.48	5.267E-03	%(	4.012E-02	1.17E-02	G K
		636.97	8.275E-02	%	4.709E-01	1.34E-01	G
		284.29	2.095E-01	%	5.997E-01	1.80E-01	G
CS-134	-3.3843E-03						
		604.66	-3.384E-03	%(	9.902E-02	2.92E-02	G K
		795.76	-1.662E-05	%	4.398E-02	1.21E-02	G
		569.29	-2.598E-02	&	2.172E-01	6.20E-02	G
		801.84	7.653E-02	%	3.435E-01	9.78E-02	G
CS-137	8.5810E-02						
		661.62	8.581E-02	(	3.883E-02	1.55E-02	G
CE-139	1.6869E-03						
		165.85	1.687E-03	&(P	4.343E-02	1.29E-02	G
EU-152	2.5415E-02						
		121.78	2.541E-02	&(	1.063E-01	3.18E-02	G K
		344.30	2.482E-02	%	1.108E-01	3.27E-02	G
		1408.08	0.000E+00	%	2.164E-01	5.72E-02	G
		964.00	5.133E-03	&	5.284E-01	1.52E-01	G
		1112.07	5.814E-02	&	3.337E-01	9.46E-02	G
		778.90	9.928E-02	%	2.655E-01	7.89E-02	G
EU-154	-8.3042E-04						
		123.10	-8.304E-04	%(	9.370E-02	2.78E-02	G K
		1274.80	-2.168E-02	&	1.670E-01	4.73E-02	G
		723.30	-1.025E-01	&	2.977E-01	8.89E-02	G
		1004.80	1.406E-02	%	2.779E-01	7.75E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	8.6469E-02						
		86.45	8.647E-02	&(	1.412E-01	4.31E-02	G K
		105.31	6.190E-02	%	1.819E-01	5.48E-02	G
HG-203	2.5500E-02						
		279.17	2.550E-02	&(P	3.641E-02	1.12E-02	G K
		72.87	-1.540E-01	&	9.773E-01	2.93E-01	G
		70.83	6.084E-02	%	1.871E+00	5.58E-01	G
		82.50	-6.651E-02	%	2.220E+00	6.61E-01	G
TL-208	2.0431E-01						
		583.14	2.043E-01	@(	4.140E-02	2.10E-02	G
		510.72	3.251E-01	+	1.416E-01	5.63E-02	G
PB-212	5.0913E-01						
							Energy duplication
		238.63	4.910E-01	(	8.355E-02	3.30E-02	G K
							Energy duplication
		77.11	5.466E-01	(	2.975E-01	9.51E-02	G
		74.81	5.221E-01	&(	5.930E-01	1.83E-01	G
PB-214	3.4666E-01						
		351.99	3.473E-01	(	8.319E-02	3.38E-02	G K
		295.22	2.710E-01	-	1.703E-01	5.64E-02	G
							Energy duplication
		77.11	8.940E-01	+	4.866E-01	1.55E-01	G
		241.92	3.437E-01	?(	3.365E-01	1.07E-01	G
BI-212	5.7770E-01						
		727.17	5.777E-01	(	4.106E-01	1.70E-01	G K
		1620.56	3.195E-01	%	1.045E+00	2.96E-01	G
		785.42	7.394E-01	%	1.872E+00	5.59E-01	G
BI-214	4.1501E-01						
		609.32	4.066E-01	(	9.595E-02	4.79E-02	G K
		1764.51	4.392E-01	(	1.245E-01	8.61E-02	G
		1120.28	1.088E+00	+	3.476E-01	1.79E-01	G
RA-224	8.6230E-01						
		241.00	8.623E-01	(	1.069E+00	3.30E-01	G
RA-226	1.2108E+00						
		185.99	1.211E+00	*(	1.018E+00	3.21E-01	G
AC-228	5.9432E-01						
		911.07	5.796E-01	(	1.461E-01	7.62E-02	G K
		968.90	5.931E-01	(	1.970E-01	9.01E-02	G
		338.40	6.315E-01	@(	2.569E-01	9.96E-02	G

Yankee Chemistry Spectrum name: 101F_16DEC2004_1945.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-1.3690E-01						
		236.00	-1.369E-01	%(	4.211E-01	1.27E-01	G K
		256.25	-7.527E-02	&	4.903E-01	1.45E-01	G
PA-234	1.7531E-02						
		98.44	1.753E-02	%(	1.617E-01	4.82E-02	G K
		946.00	-6.035E-02	%	2.688E-01	7.82E-02	G
		131.28	4.528E-03	&	1.943E-01	5.77E-02	G
		94.67	-1.141E-02	%	2.749E-01	8.18E-02	G
		883.24	-2.822E-02	&	3.669E-01	1.03E-01	G
		926.70	0.000E+00	&	3.689E-01	1.01E-01	G
		569.26	-3.965E-02	&	3.222E-01	9.21E-02	G
TH-234	1.4153E+00						
		63.29	7.514E-01	%(	1.965E+00	5.94E-01	G K
		92.80	1.890E+00	(	1.411E+00	4.44E-01	G
		92.38	1.869E+00	(	1.698E+00	5.28E-01	G
AM-241	-1.9833E-02						
		59.54	-1.983E-02	%(P	2.650E-01	7.89E-02	G

(- This peak used in the nuclide activity average.

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

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

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

- -

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

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-2.9020E-02	-2.9500E-02	3.2765E-01	3.2765E-01	3.721E-01
K-40		9.5148E+00	9.5148E+00	1.3662E+00	1.4682E+00	
MN-54	#A	-3.5366E-03	-3.5466E-03	3.5703E-02	3.5703E-02	4.218E-02
CO-57	#B	1.7410E-03	1.7467E-03	3.8768E-02	3.8768E-02	4.338E-02
CO-60	#B	-1.2845E-02	-1.2851E-02	1.4088E+00	1.4088E+00	5.337E-02
Sr-85	#A	-9.7806E-03	-9.9135E-03	3.8753E-02	3.8757E-02	4.327E-02
Kr-85	#A	-2.2801E+02	-2.2801E+02	8.8325E+02	8.8334E+02	9.993E+02
Y-88	#B	-7.1537E-03	-7.2127E-03	4.3982E-02	4.3984E-02	4.505E-02
NB-94	#B	1.8544E-03	1.8544E-03	3.1154E-02	3.1154E-02	3.770E-02
Ag-108M	#B	-2.5354E-02	-2.5355E-02	5.7898E-02	5.7916E-02	6.426E-02
CD-109	#A	1.7055E-01	1.7088E-01	1.1199E+00	1.1200E+00	1.246E+00
SN-113	#B	2.0809E-02	2.0968E-02	4.6824E-02	4.6839E-02	5.166E-02
SB-125	#B	6.6482E-03	6.6540E-03	7.9772E-02	7.9772E-02	9.328E-02
I-131	#B	4.7242E-03	5.2673E-03	3.4982E-02	3.4983E-02	3.599E-02
CS-134	#B	-3.3804E-03	-3.3843E-03	8.7722E-02	8.7722E-02	9.891E-02
CS-137		8.5803E-02	8.5810E-02	4.6452E-02	4.6704E-02	
CE-139	#A	1.6762E-03	1.6869E-03	3.8571E-02	3.8571E-02	4.316E-02
EU-152	#B	2.5410E-02	2.5415E-02	9.5460E-02	9.5470E-02	1.063E-01
EU-154	#B	-8.3019E-04	-8.3042E-04	8.3418E-02	8.3418E-02	9.367E-02
EU-155	#B	8.6427E-02	8.6469E-02	1.2922E-01	1.2931E-01	1.412E-01
HG-203	#B	2.5026E-02	2.5500E-02	3.3530E-02	3.3561E-02	3.573E-02
TL-208	#	2.0431E-01	2.0431E-01	6.2879E-02	6.3930E-02	
PB-212	#	5.0913E-01	5.0913E-01	1.0271E-01	1.0666E-01	8.355E-02
PB-214	#	3.4666E-01	3.4666E-01	1.0123E-01	1.0311E-01	8.319E-02
BI-212	#	5.7770E-01	5.7770E-01	5.1006E-01	5.1110E-01	
BI-214		4.1501E-01	4.1501E-01	1.4240E-01	1.4432E-01	
RA-224	#A	8.6230E-01	8.6230E-01	9.9000E-01	9.9120E-01	1.069E+00
RA-226	#	1.2108E+00	1.2108E+00	9.6351E-01	9.6594E-01	1.018E+00
AC-228		5.9432E-01	5.9432E-01	1.5183E-01	1.5550E-01	
TH-227	#B	-1.3690E-01	-1.3690E-01	3.8019E-01	3.8027E-01	4.211E-01
PA-234	#B	1.7531E-02	1.7531E-02	1.4472E-01	1.4472E-01	1.617E-01
TH-234	#B	1.4153E+00	1.4153E+00	9.9673E-01	9.9982E-01	1.965E+00
AM-241	#A	-1.9833E-02	-1.9833E-02	2.5042E-01	2.5042E-01	2.650E-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

Yankee Chemistry Spectrum name: 101F_16DEC2004_1945.An1

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

Total Activity (1120.2 to 1999.1 keV) 1.1391912E+01 pCi/gm
Total Decayed Activity (1120.2 to 1999.1 keV) 1.1391918E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_20DEC2004_1515.An1

Sample description
Detector 101 FSS-OOL-04-01-008-F-R WET

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_20DEC2004_1515.An1

Acquisition information

Start time:	20-Dec-2004 15:09:22
Live time:	2000
Real time:	2003
Dead time:	0.16 %
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:	1.6090E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.6090E+03) = 6.2150E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_20DEC2004_1515.An1

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	15-Dec-2004 13:24:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1881

***** 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
74.74	162.	24.22	1.50	1.654E-02	74.81	9.600	8.548E-01	PB212
77.02	176.	21.95	1.50	1.720E-02	77.11	17.500	4.900E-01	PB212
					77.11	10.700	8.014E-01	PB214
77.02	176.	21.95	1.50	1.720E-02	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	8.014E-01	PB214
185.73	119.	23.22	1.01	1.860E-02				
185.73	119.	23.22	1.01	1.860E-02	185.99	3.280	1.640E+00	RA226
238.67	461.	5.44	1.12	1.558E-02				
238.67	461.	5.44	1.12	1.558E-02	238.63	43.100	5.768E-01	PB212
241.98	87.	18.81	1.12	1.540E-02	241.00	3.900	1.211E+00	RA224
					241.92	7.470	6.343E-01	PB214
295.24	117.	12.67	1.16	1.292E-02				
295.24	117.	12.67	1.16	1.292E-02	295.22	19.200	3.955E-01	PB214
300.05	32.	38.04	1.16	1.273E-02				
338.36	119.	16.82	1.23	1.135E-02	338.40	12.010	7.314E-01	AC228
351.90	207.	10.88	1.20	1.093E-02				
351.90	207.	10.88	1.20	1.093E-02	351.99	37.100	4.289E-01	PB214
463.19	32.	38.46	0.72	8.347E-03				
463.19	32.	38.46	0.72	8.347E-03	463.51	10.000	3.284E-01	SB125
510.42	84.	15.01	2.10	7.595E-03				
510.42	84.	15.01	2.10	7.595E-03	510.72	22.500	4.131E-01	TL208
583.06	113.	12.02	1.06	6.685E-03				
583.06	113.	12.02	1.06	6.685E-03	583.14	86.000	1.645E-01	TL208
609.04	144.	11.28	1.25	6.415E-03	609.32	46.090	4.092E-01	BI214
661.48	96.	16.97	1.37	5.939E-03	661.62	84.620	1.607E-01	CS137
727.35	22.	38.35	1.50	5.443E-03	727.17	11.800	PBC<MDA	BI212

910.69	96.	14.65	1.90	4.448E-03	911.07	29.000	6.279E-01	AC228
967.82	73.	18.73	0.77	4.216E-03	968.90	17.460	8.348E-01	AC228
1120.05	30.	26.78	1.78	3.711E-03	1120.28	15.040	4.575E-01	BI214
1460.39	331.	5.74	2.29	2.943E-03	1460.75	10.700	8.827E+00	K40
1763.58	22.	21.32	0.87	2.481E-03	1764.51	15.920	4.677E-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	
477.03	238.61	84.	461.	0.231	16.31	1.122	PB-212	D
483.67	241.93	90.	87.	0.043	56.43	1.124	PB-214	D
599.70	299.98	110.	43.	0.022	111.85	0.619	TH-227	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	149.04	74.74	685.	162.	0.081	72.67	1.499s
PB-212	153.79	77.11	655.	176.	0.088	65.85	1.499D
PB-214	153.79	77.11	655.	176.	0.088	65.85	1.499D
RA-226	371.65	186.00	266.	93.	0.047	80.56	1.499s
PB-212	476.94	238.62	231.	340.	0.170	25.03	1.499
RA-224	483.11	241.70	264.	75.	0.037	98.61	1.499
PB-214	590.22	295.24	69.	133.	0.067	37.00	1.499
AC-228	676.51	338.36	90.	119.	0.059	50.46	1.226
PB-214	703.50	351.85	74.	193.	0.096	28.78	1.499
SB-125	926.43	463.27	43.	26.	0.013	122.09	1.499s
TL-208	1021.46	510.76	38.	64.	0.032	55.77	1.499s
TL-208	1166.26	583.12	23.	114.	0.057	33.27	1.499
BI-214	1218.11	609.04	40.	144.	0.072	33.85	1.246s
CS-137	1323.06	661.48	46.	96.	0.048	50.91	1.366
BI-212	1454.86	727.35	26.	22.	0.011	115.05	1.499s
AC-228	1821.74	910.69	29.	96.	0.048	43.94	1.901s
AC-228	1936.05	967.82	28.	73.	0.037	56.19	0.766s
BI-214	2240.68	1120.05	16.	30.	0.015	80.34	1.776
K-40	2921.80	1460.39	8.	331.	0.165	17.22	2.289
BI-214	3528.60	1763.58	0.	22.	0.011	63.96	0.874s

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		1.5532E-01					
			477.56	1.553E-01	%(	3.581E-01 1.08E-01	G
K-40		8.8270E+00					
			1460.75	8.827E+00	(	4.261E-01 5.07E-01	G
MN-54		7.0564E-03					
			834.81	7.056E-03	%(	4.847E-02 1.37E-02	G
CO-57		7.3921E-03					
			122.07	7.392E-03	%(P	4.605E-02 1.37E-02	G K
			136.43	-8.235E-02	%	3.738E-01 1.12E-01	G
CO-60		8.9503E-03					
			1332.51	8.950E-03	%(P	6.540E-02 1.71E-02	G K
			1173.23	6.422E-03	% P	6.682E-02 1.77E-02	G K
Sr-85		-2.2448E-02					
			514.00	-2.245E-02	%(	5.776E-02 1.73E-02	G
Kr-85		-4.9124E+02					
			513.99	-4.912E+02	%(	1.263E+03 3.79E+02	G
Y-88		-5.2559E-03					
			1836.01	-5.256E-03	%(P	4.569E-02 1.13E-02	G K
			898.02	-1.640E-03	% P	7.312E-02 2.03E-02	G
NB-94		0.0000E+00					
			871.10	0.000E+00	&(	5.132E-02 1.41E-02	G K
			702.50	7.702E-03	%	4.081E-02 1.17E-02	G K
Ag-108M		8.2314E-03					
			722.95	8.231E-03	%(	4.634E-02 1.32E-02	G K
			614.37	1.025E-02	%	4.063E-02 1.18E-02	G
			433.93	8.447E-03	&	3.191E-02 9.31E-03	G
CD-109		1.9245E-01					
			88.04	1.925E-01	%(	1.325E+00 3.95E-01	G
SN-113		-1.6457E-03					
			391.71	-1.646E-03	&(P	7.579E-02 2.18E-02	G K
			255.04	7.258E-01	&	1.611E+00 4.87E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	8.7305E-02						
		427.95	2.764E-02	%(	1.176E-01	3.44E-02	G K
		600.77	-2.292E-02	%	2.349E-01	6.67E-02	G
		636.15	5.576E-02	%	3.576E-01	1.02E-01	G
		463.51	2.639E-01	*(	3.377E-01	1.07E-01	G
		176.29	4.147E-02	%	5.664E-01	1.67E-01	G
I-131	-1.6158E-02						
		364.48	-1.616E-02	&(	6.717E-02	1.98E-02	G K
		636.97	1.544E-02	%	8.499E-01	2.35E-01	G
		284.29	2.358E-01	%	8.677E-01	2.58E-01	G
CS-134	1.8306E-03						
		604.66	1.831E-03	%(	3.117E-02	8.50E-03	G K
		795.76	-1.185E-04	%	5.068E-02	1.38E-02	G
		569.29	2.488E-02	&	2.899E-01	8.26E-02	G
		801.84	7.940E-02	&	4.612E-01	1.30E-01	G
CS-137	1.6069E-01						
		661.62	1.607E-01	(	5.732E-02	2.73E-02	G
CE-139	-5.8387E-04						
		165.85	-5.839E-04	%(P	4.412E-02	1.29E-02	G
EU-152	2.6120E-03						
		121.78	2.612E-03	%(	1.331E-01	3.93E-02	G K
		344.30	-2.095E-02	%	1.356E-01	3.96E-02	G
		1408.08	4.718E-02	%	2.537E-01	7.08E-02	G
		964.00	1.192E-01	&	4.482E-01	1.31E-01	G
		1112.07	7.655E-02	&	3.839E-01	1.09E-01	G
		778.90	1.803E-02	&	3.109E-01	8.53E-02	G
EU-154	1.8716E-02						
		123.10	1.872E-02	%(	9.318E-02	2.78E-02	G K
		1274.80	-1.181E-02	%	1.596E-01	4.35E-02	G
		723.30	3.740E-02	%	2.150E-01	6.12E-02	G
		1004.80	-1.097E-03	%	2.880E-01	7.79E-02	G
EU-155	-2.8656E-03						
		86.45	-2.866E-03	%(	1.715E-01	5.10E-02	G K
		105.31	1.639E-02	%	1.847E-01	5.48E-02	G
HG-203	-8.5389E-03						
		279.17	-8.539E-03	&(P	5.022E-02	1.45E-02	G K
		72.87	-1.391E-01	%	1.153E+00	3.45E-01	G
		70.83	-5.808E-01	&	2.190E+00	6.58E-01	G
		82.50	8.787E-02	%	2.572E+00	7.64E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.6599E-01						
		583.14	1.660E-01	(	3.629E-02	1.84E-02	G
		510.72	3.136E-01	+	1.553E-01	5.83E-02	G
PB-212	4.4366E-01						
		238.63	4.248E-01	(	9.210E-02	3.54E-02	G K
							Energy duplication
		77.11	4.900E-01	(	3.403E-01	1.08E-01	G
		74.81	8.548E-01	+	6.596E-01	2.07E-01	G
PB-214	4.1711E-01						
		351.99	3.992E-01	(	8.894E-02	3.83E-02	G K
		295.22	4.517E-01	(	1.399E-01	5.57E-02	G
							Energy duplication
		77.11	8.014E-01	+	5.566E-01	1.76E-01	G
							Energy duplication
		241.92	5.895E-02	%	7.109E-01	2.11E-01	G
BI-212	2.9246E-01						
		727.17	2.925E-01	*(	3.438E-01	1.12E-01	G K
		1620.56	0.000E+00	%	8.393E-01	1.14E-01	G
		785.42	9.497E-01	%	1.876E+00	5.74E-01	G
BI-214	4.3071E-01						
		609.32	4.092E-01	*(	9.145E-02	4.62E-02	G K
		1764.51	4.677E-01	(	1.567E-01	9.97E-02	G
		1120.28	4.575E-01	(	3.178E-01	1.22E-01	G
RA-224	1.0420E+00						
		241.00	1.042E+00	(	1.094E+00	3.42E-01	G
RA-226	1.2832E+00						
		185.99	1.283E+00	*(	1.085E+00	3.45E-01	G
AC-228	7.1092E-01						
		911.07	6.279E-01	(	1.800E-01	9.19E-02	G K
		968.90	8.348E-01	*(	3.120E-01	1.56E-01	G
		338.40	7.314E-01	(	2.895E-01	1.23E-01	G
TH-227	-5.5053E-02						
		236.00	-5.505E-02	%(	3.288E-01	9.72E-02	G K
		256.25	-2.427E-01	%	6.063E-01	1.83E-01	G
PA-234	1.8476E-02						
		98.44	1.848E-02	&(	1.726E-01	5.13E-02	G K
		946.00	-7.366E-03	&	2.686E-01	7.40E-02	G
		131.28	7.503E-02	&	1.835E-01	5.54E-02	G
		94.67	-5.929E-02	%	3.204E-01	9.59E-02	G
		883.24	2.280E-03	%	3.929E-01	1.07E-01	G
		926.70	-5.171E-02	%	4.089E-01	1.14E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		569.26	3.738E-02	&	4.279E-01	1.22E-01	G
TH-234	1.0334E+00						
		63.29	1.033E+00	%(	2.074E+00	6.30E-01	G K
		92.80	1.122E+00	%	1.573E+00	4.82E-01	G
		92.38	1.283E+00	%	1.862E+00	5.70E-01	G
AM-241	-7.6331E-02						
		59.54	-7.633E-02	%(P	2.857E-01	8.57E-02	G

(- This peak used in the nuclide activity average.

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

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

- -

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

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.4542E-01	1.5532E-01	3.2359E-01	3.2371E-01	3.352E-01
K-40		8.8270E+00	8.8270E+00	1.5202E+00	1.6000E+00	
MN-54	#A	6.9774E-03	7.0564E-03	4.1157E-02	4.1159E-02	4.793E-02
CO-57	#B	7.2964E-03	7.3921E-03	4.1119E-02	4.1121E-02	4.546E-02
CO-60	#B	8.9340E-03	8.9503E-03	5.1185E-02	5.1188E-02	6.528E-02

Sr-85	#A	-2.1263E-02	-2.2448E-02	5.2015E-02	5.2030E-02	5.471E-02
Kr-85	#A	-4.9123E+02	-4.9124E+02	1.1376E+03	1.1379E+03	1.263E+03
Y-88	#B	-5.0853E-03	-5.2559E-03	4.7854E-02	4.7855E-02	4.421E-02
NB-94	#B	0.0000E+00	0.0000E+00	4.2247E-02	4.2247E-02	5.132E-02
Ag-108M	#B	8.2308E-03	8.2314E-03	3.9627E-02	3.9630E-02	4.634E-02
CD-109	#A	1.9097E-01	1.9245E-01	1.1861E+00	1.1862E+00	1.315E+00
SN-113	#B	-1.5962E-03	-1.6457E-03	1.5675E-01	1.5675E-01	7.351E-02
SB-125	#B	8.7002E-02	8.7305E-02	1.0659E-01	1.0670E-01	1.171E-01
I-131	#B	-1.0434E-02	-1.6158E-02	5.9303E-02	5.9310E-02	4.337E-02
CS-134	#B	1.8221E-03	1.8306E-03	2.5508E-02	2.5508E-02	3.102E-02
CS-137		1.6064E-01	1.6069E-01	8.1805E-02	8.2308E-02	
CE-139	#A	-5.6913E-04	-5.8387E-04	5.0559E-02	5.0559E-02	4.301E-02
EU-152	#B	2.6100E-03	2.6120E-03	1.1797E-01	1.1797E-01	1.330E-01
EU-154	#B	1.8695E-02	1.8716E-02	8.3405E-02	8.3411E-02	9.307E-02
EU-155	#B	-2.8600E-03	-2.8656E-03	1.5291E-01	1.5291E-01	1.711E-01
HG-203	#B	-7.9181E-03	-8.5389E-03	1.2607E-01	1.2607E-01	4.657E-02
TL-208	#	1.6599E-01	1.6599E-01	5.5219E-02	5.6010E-02	3.629E-02
PB-212	#	4.4366E-01	4.4366E-01	1.1104E-01	1.1384E-01	9.210E-02
PB-214	#	4.1711E-01	4.1711E-01	9.7766E-02	1.0057E-01	8.894E-02
BI-212	#A	2.9246E-01	2.9246E-01	3.3647E-01	3.3688E-01	3.438E-01
BI-214		4.3071E-01	4.3071E-01	1.4580E-01	1.4781E-01	
RA-224	#A	1.0420E+00	1.0420E+00	1.0275E+00	1.0292E+00	1.094E+00
RA-226	#	1.2832E+00	1.2832E+00	1.0338E+00	1.0363E+00	1.085E+00
AC-228		7.1092E-01	7.1092E-01	2.0706E-01	2.1092E-01	
TH-227	#B	-5.5053E-02	-5.5053E-02	2.9165E-01	2.9166E-01	3.288E-01
PA-234	#B	1.8476E-02	1.8476E-02	1.5400E-01	1.5400E-01	1.726E-01
TH-234	#B	1.0334E+00	1.0334E+00	1.8888E+00	1.8897E+00	2.074E+00
AM-241	#A	-7.6330E-02	-7.6331E-02	2.6172E-01	2.6176E-01	2.857E-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) 1.0129307E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.0129358E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_20DEC2004_1555.An1

Sample description
Detector 101 FSS-OOL-04-01-017-F-R WET

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_20DEC2004_1555.An1

Acquisition information

Start time:	20-Dec-2004 15:50:42
Live time:	2000
Real time:	2004
Dead time:	0.18 %
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:	1.9520E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.9520E+03) = 5.1230E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_20DEC2004_1555.An1

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	15-Dec-2004 13:40:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1302

***** 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	245.	12.48	1.00	1.654E-02	74.81	9.600	1.068E+00	PB212
77.05	277.	9.66	1.01	1.720E-02	77.11	17.500	7.042E-01	PB212
92.95	107.	33.17	1.50	2.008E-02	92.38	2.570	1.452E+00	TH234
					92.80	3.000	1.241E+00	TH234
					94.67	15.500	2.379E-01	PA234
92.97	98.	41.47	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.136E+00	TH234
					94.67	15.500	2.178E-01	PA234
185.98	95.	30.41	0.75	1.858E-02				
185.98	95.	30.41	0.75	1.858E-02	185.99	3.280	1.082E+00	RA226
209.49	89.	34.03	1.05	1.720E-02				
238.66	617.	4.82	1.12	1.557E-02	238.63	43.100	6.359E-01	PB212
241.54	87.	23.99	1.12	1.542E-02	241.00	3.900	9.969E-01	RA224
					241.92	7.470	5.221E-01	PB214
270.46	72.	23.98	1.54	1.399E-02				
295.35	153.	13.22	1.27	1.291E-02	295.22	19.200	4.275E-01	PB214
300.49	60.	28.94	0.74	1.271E-02				
338.16	99.	17.60	1.10	1.136E-02	338.40	12.010	5.043E-01	AC228
351.86	251.	9.20	1.12	1.093E-02	351.99	37.100	4.291E-01	PB214
462.99	32.	39.97	0.63	8.351E-03				
462.99	32.	39.97	0.63	8.351E-03	463.51	10.000	2.623E-01	SB125
510.67	88.	20.99	1.41	7.591E-03	510.72	22.500	3.571E-01	TL208
583.03	190.	11.60	1.01	6.686E-03	583.14	86.000	2.283E-01	TL208
609.01	220.	9.62	1.44	6.416E-03	609.32	46.090	5.153E-01	BI214
661.39	192.	11.29	1.25	5.939E-03	661.62	84.620	2.652E-01	CS137
910.72	140.	10.85	1.78	4.448E-03	911.07	29.000	7.495E-01	AC228

968.72	62.	16.98	1.57	4.213E-03	968.90	17.460	5.827E-01	AC228
1120.08	50.	20.11	1.35	3.711E-03	1120.28	15.040	6.190E-01	BI214
1460.38	486.	4.70	1.70	2.943E-03	1460.75	10.700	1.069E+01	K40
1764.16	16.	35.16	2.11	2.481E-03	1764.51	15.920	2.797E-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	
418.66	209.49	322.	89.	0.045	102.09	1.051	AC-228	
540.65	270.46	113.	72.	0.036	71.93	1.539	AC-228	s
600.74	300.49	107.	60.	0.030	86.83	0.736	PB-212	s
925.89	462.99	60.	32.	0.016	119.92	0.626	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	149.19	74.81	345.	245.	0.123	37.44	1.005D
PB-212	153.79	77.11	337.	277.	0.139	28.97	1.006A
TH-234	185.52	92.97	775.	98.	0.049	124.40	1.499
PA-234	185.48	92.95	576.	107.	0.053	99.50	1.499
RA-226	371.64	185.99	410.	95.	0.047	95.74	1.499D
PB-212	476.96	238.63	133.	617.	0.308	14.45	1.122D
PB-214	483.54	241.92	146.	85.	0.043	68.41	1.124D
PB-214	590.45	295.35	112.	153.	0.077	39.67	1.270s
AC-228	676.10	338.16	90.	99.	0.050	52.81	1.099s
PB-214	703.52	351.86	109.	251.	0.126	27.60	1.115
TL-208	1021.28	510.67	82.	88.	0.044	62.97	1.413s
TL-208	1166.08	583.03	86.	190.	0.095	34.79	1.010
BI-214	1218.05	609.01	65.	220.	0.110	28.85	1.436s
CS-137	1322.87	661.39	76.	192.	0.096	33.88	1.249
AC-228	1821.79	910.72	26.	140.	0.070	32.55	1.777
AC-228	1937.84	968.72	23.	62.	0.031	50.93	1.573
BI-214	2240.76	1120.08	22.	50.	0.025	60.34	1.350
K-40	2921.77	1460.38	10.	486.	0.243	14.09	1.701
BI-214	3529.75	1764.16	8.	16.	0.008	105.48	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	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		-3.4405E-02					
			477.56	-3.441E-02	%(	4.197E-01 1.21E-01	G
K-40		1.0686E+01					
			1460.75	1.069E+01	(	3.836E-01 5.02E-01	G
MN-54		-1.8496E-03					
			834.81	-1.850E-03	%(	3.832E-02 1.06E-02	G
CO-57		1.5619E-02					
			122.07	1.562E-02	&(P	3.996E-02 1.21E-02	G K
			136.43	-7.703E-03	%	3.638E-01 1.08E-01	G
CO-60		-7.5604E-04					
			1332.51	-7.560E-04	&(P	5.531E-02 1.39E-02	G K
			1173.23	-2.833E-03	% P	6.777E-02 1.81E-02	G K
Sr-85		-1.4438E-02					
			514.00	-1.444E-02	%(	4.963E-02 1.47E-02	G
Kr-85		-3.1576E+02					
			513.99	-3.158E+02	%(	1.085E+03 3.22E+02	G
Y-88		-7.4285E-04					
			1836.01	-7.428E-04	&(P	5.050E-02 1.27E-02	G K
			898.02	1.181E-02	% P	3.616E-02 1.05E-02	G
NB-94		-1.6488E-03					
			871.10	-1.649E-03	%(	4.936E-02 1.38E-02	G K
			702.50	1.601E-02	%	3.855E-02 1.16E-02	G K
Ag-108M		-6.5909E-03					
			722.95	-6.591E-03	%(	5.049E-02 1.45E-02	G K
			614.37	-8.098E-03	%	4.908E-02 1.43E-02	G
			433.93	-1.116E-02	&	4.859E-02 1.44E-02	G
CD-109		4.2387E-01					
			88.04	4.239E-01	&(	1.307E+00 3.94E-01	G
SN-113		-8.1165E-03					
			391.71	-8.116E-03	%(P	5.840E-02 1.69E-02	G K
			255.04	-4.749E-01	%	1.817E+00 5.42E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-4.9504E-03						
		427.95	-4.950E-03	&(	1.245E-01	3.58E-02	G K
		600.77	-3.834E-02	%	2.293E-01	6.65E-02	G
		636.15	5.514E-02	&	2.714E-01	7.77E-02	G
		463.51	2.222E-01	%	3.786E-01	1.16E-01	G
		176.29	3.540E-02	%	6.169E-01	1.83E-01	G
I-131	3.0699E-03						
		364.48	3.070E-03	&(	6.637E-02	1.92E-02	G K
		636.97	-2.557E-02	%	9.391E-01	2.66E-01	G
		284.29	2.956E-02	%	8.982E-01	2.62E-01	G
CS-134	-5.9814E-03						
		604.66	-5.981E-03	%(	4.743E-02	1.37E-02	G K
		795.76	0.000E+00	&	7.633E-02	2.18E-02	G
		569.29	-5.002E-02	%	2.411E-01	7.01E-02	G
		801.84	-3.204E-02	&	4.652E-01	1.30E-01	G
CS-137	2.6519E-01						
		661.62	2.652E-01	(	5.958E-02	2.99E-02	G
CE-139	-2.9485E-03						
		165.85	-2.948E-03	&(P	4.425E-02	1.31E-02	G
EU-152	1.0247E-03						
		121.78	1.025E-03	%(	1.350E-01	4.01E-02	G K
		344.30	2.814E-02	%	1.253E-01	3.70E-02	G
		1408.08	0.000E+00	&	2.246E-01	5.93E-02	G
		964.00	3.337E-02	%	3.812E-01	1.08E-01	G
		1112.07	7.468E-02	%	3.412E-01	9.77E-02	G
		778.90	-1.518E-02	%	3.225E-01	9.02E-02	G
EU-154	-8.6221E-04						
		123.10	-8.622E-04	%(	9.601E-02	2.85E-02	G K
		1274.80	1.032E-02	%	1.563E-01	4.33E-02	G
		723.30	-5.127E-02	%	2.611E-01	7.62E-02	G
		1004.80	-2.398E-02	%	2.666E-01	7.45E-02	G
EU-155	3.5431E-03						
		86.45	3.543E-03	&(	1.592E-01	4.75E-02	G K
		105.31	7.735E-03	%	1.889E-01	5.62E-02	G
HG-203	-1.7794E-02						
		279.17	-1.779E-02	%(P	5.229E-02	1.55E-02	G K
		72.87	-4.321E-01	%	1.204E+00	3.64E-01	G
		70.83	-1.195E-01	%	1.406E+00	4.17E-01	G
		82.50	-5.628E-01	%	2.510E+00	7.54E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.2833E-01						
		583.14	2.283E-01	(	5.543E-02	2.65E-02	G
		510.72	3.571E-01	+	1.819E-01	7.49E-02	G
PB-212	6.5562E-01						
		238.63	6.359E-01	(	5.821E-02	3.06E-02	G K
							Energy duplication
		77.11	6.376E-01	}	2.029E-01	6.16E-02	G
		74.81	1.068E+00	+	3.892E-01	1.33E-01	G
PB-214	4.3836E-01						
		351.99	4.291E-01	(	8.765E-02	3.95E-02	G K
		295.22	4.275E-01	*(	1.451E-01	5.66E-02	G
							Energy duplication
		77.11	0.000E+00	}	4.659E-01	0.00E+00	G
		241.92	5.123E-01	(	3.550E-01	1.17E-01	G
BI-212	2.0425E-01						
		727.17	2.043E-01	%(	3.590E-01	1.11E-01	G K
		1620.56	1.666E-01	&	1.601E+00	4.27E-01	G
		785.42	1.220E+00	%	1.846E+00	5.81E-01	G
BI-214	5.4081E-01						
		609.32	5.153E-01	@(	9.435E-02	4.95E-02	G K
		1764.51	2.797E-01	-	2.750E-01	9.83E-02	G
		1120.28	6.190E-01	(	3.054E-01	1.24E-01	G
RA-224	8.3556E-01						
		241.00	8.356E-01	%(	1.145E+00	3.52E-01	G
RA-226	1.0763E+00						
							Energy duplication
		185.99	1.076E+00	(	1.102E+00	3.44E-01	G
AC-228	7.4948E-01						
		911.07	7.495E-01	(	1.431E-01	8.13E-02	G K
		968.90	5.827E-01	-	2.363E-01	9.89E-02	G
		338.40	5.043E-01	-	2.379E-01	8.87E-02	G
TH-227	-1.7083E-02						
		236.00	-1.708E-02	&(	3.931E-01	1.16E-01	G K
		256.25	-1.671E-01	%	5.145E-01	1.54E-01	G
PA-234	8.6659E-02						
		98.44	-6.763E-03	%(	1.705E-01	5.07E-02	G K
		946.00	3.394E-02	&	2.429E-01	6.91E-02	G
		131.28	3.499E-03	%	1.903E-01	5.64E-02	G
		94.67	2.379E-01	&(	2.548E-01	7.89E-02	G
		883.24	-3.853E-04	%	3.882E-01	1.07E-01	G
		926.70	-5.574E-02	%	3.807E-01	1.08E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-7.390E-02 %   3.560E-01 1.04E-01 G

TH-234       7.2006E-01
                           63.29 4.003E-01 %(  2.082E+00 6.24E-01 G K
                           92.80 1.136E+00  (  1.536E+00 4.71E-01 G
                           92.38 8.667E-02 %   1.832E+00 5.46E-01 G

AM-241       4.1427E-03
                           59.54 4.143E-03 %(P 2.854E-01 8.48E-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	-3.2205E-02	-3.4405E-02	3.6405E-01	3.6405E-01	3.929E-01
K-40		1.0686E+01	1.0686E+01	1.5057E+00	1.6222E+00	
MN-54	#A	-1.8288E-03	-1.8496E-03	3.1674E-02	3.1674E-02	3.789E-02
CO-57	#B	1.5416E-02	1.5619E-02	3.6159E-02	3.6170E-02	3.944E-02
CO-60	#B	-7.5466E-04	-7.5604E-04	4.6372E-02	4.6372E-02	5.521E-02

Sr-85	#A	-1.3674E-02	-1.4438E-02	4.4232E-02	4.4239E-02	4.700E-02
Kr-85	#A	-3.1574E+02	-3.1576E+02	9.6710E+02	9.6726E+02	1.085E+03
Y-88	#B	-7.1866E-04	-7.4285E-04	1.8755E-02	1.8755E-02	4.885E-02
NB-94	#B	-1.6488E-03	-1.6488E-03	4.1514E-02	4.1515E-02	4.936E-02
Ag-108M	#B	-6.5904E-03	-6.5909E-03	4.3480E-02	4.3482E-02	5.048E-02
CD-109	#A	4.2058E-01	4.2387E-01	1.1817E+00	1.1819E+00	1.297E+00
SN-113	#B	-7.8714E-03	-8.1165E-03	7.1176E-02	7.1177E-02	5.664E-02
SB-125	#B	-4.9331E-03	-4.9504E-03	1.0749E-01	1.0749E-01	1.241E-01
I-131	#B	1.9793E-03	3.0699E-03	5.7640E-02	5.7640E-02	4.279E-02
CS-134	#B	-5.9534E-03	-5.9814E-03	4.1192E-02	4.1193E-02	4.721E-02
CS-137		2.6511E-01	2.6519E-01	8.9847E-02	9.1088E-02	
CE-139	#A	-2.8738E-03	-2.9485E-03	4.1035E-02	4.1035E-02	4.313E-02
EU-152	#B	1.0240E-03	1.0247E-03	1.2016E-01	1.2016E-01	1.349E-01
EU-154	#B	-8.6123E-04	-8.6221E-04	8.5453E-02	8.5453E-02	9.591E-02
EU-155	#B	3.5362E-03	3.5431E-03	1.4237E-01	1.4237E-01	1.589E-01
HG-203	#B	-1.6496E-02	-1.7794E-02	6.8663E-02	6.8670E-02	4.848E-02
TL-208		2.2833E-01	2.2833E-01	7.9429E-02	8.0470E-02	
PB-212		6.5562E-01	6.5562E-01	9.4760E-02	1.0174E-01	
PB-214		4.3836E-01	4.3836E-01	1.2099E-01	1.2349E-01	
BI-212	#B	2.0425E-01	2.0425E-01	3.3161E-01	3.3181E-01	3.590E-01
BI-214		5.4081E-01	5.4081E-01	1.5601E-01	1.5897E-01	
RA-224	#A	8.3556E-01	8.3556E-01	1.0562E+00	1.0572E+00	1.145E+00
RA-226	#A	1.0763E+00	1.0763E+00	1.0305E+00	1.0323E+00	1.102E+00
AC-228		7.4948E-01	7.4948E-01	2.4392E-01	2.4757E-01	
TH-227	#B	-1.7083E-02	-1.7083E-02	3.4906E-01	3.4907E-01	3.931E-01
PA-234	#B	8.6659E-02	8.6659E-02	8.6226E-02	8.6360E-02	1.705E-01
TH-234	#B	7.2006E-01	7.2006E-01	8.9574E-01	8.9663E-01	2.082E+00
AM-241	#A	4.1426E-03	4.1427E-03	2.5446E-01	2.5446E-01	2.854E-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) 1.3564069E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.3564154E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_21DEC2004_1520.An1

Sample description
Detector 101 FSS OOL-04-01-021-F-B

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_21DEC2004_1520.An1

Acquisition information
Start time: 21-Dec-2004 15:13:36
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: 8.9700E+02
Activity scaling factor: 1.0000E+06/(1.0000E+00* 8.9700E+02) =
1.1148E+03
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_21DEC2004_1520.An1

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	03-Dec-2004 10:58:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1541

***** 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
74.48	145.	17.13	1.00	1.644E-02				
74.48	145.	17.13	1.00	1.644E-02	74.81	9.600	1.378E+00	PB212
77.74	141.	20.57	1.01	1.737E-02	77.11	10.700	1.153E+00	PB214
					77.11	17.500	7.048E-01	PB212
87.29	85.	25.82	1.01	1.922E-02	86.45	32.740	2.069E-01	EU155
89.88	69.	30.58	1.02	1.957E-02	88.04	3.790	1.450E+00	CD109
93.15	88.	25.87	1.02	1.993E-02	92.38	2.570	2.607E+00	TH234
					92.80	3.000	2.228E+00	TH234
186.07	124.	20.56	1.13	1.858E-02	185.99	3.280	3.053E+00	RA226
209.26	63.	37.24	0.91	1.722E-02				
238.70	570.	4.86	1.12	1.557E-02	238.63	43.100	1.280E+00	PB212
242.10	85.	20.46	1.12	1.539E-02	241.00	3.900	2.127E+00	RA224
					241.92	7.470	1.114E+00	PB214
269.96	64.	33.03	0.71	1.402E-02				
295.26	150.	10.61	1.16	1.292E-02				
295.26	150.	10.61	1.16	1.292E-02	295.22	19.200	9.118E-01	PB214
300.11	36.	33.79	1.16	1.273E-02				
328.03	35.	35.80	0.97	1.170E-02				
338.30	118.	14.51	1.08	1.135E-02	338.40	12.010	1.300E+00	AC228
351.98	238.	10.93	1.12	1.092E-02				
351.98	238.	10.93	1.12	1.092E-02	351.99	37.100	8.861E-01	PB214
462.89	50.	26.59	1.59	8.352E-03				
462.89	50.	26.59	1.59	8.352E-03	463.51	10.000	9.052E-01	SB125
510.80	95.	20.95	1.62	7.589E-03	510.72	22.500	8.362E-01	TL208
582.96	183.	10.69	1.25	6.686E-03	583.14	86.000	4.796E-01	TL208
609.25	178.	9.80	1.22	6.413E-03	609.32	46.090	9.073E-01	BI214

661.55	107.	14.94	1.31	5.938E-03	661.62	84.620	3.206E-01	CS137
727.76	45.	23.41	0.97	5.439E-03	727.17	11.800	1.056E+00	BI212
860.06	38.	21.38	1.47	4.679E-03				
910.96	123.	11.17	1.53	4.447E-03	911.07	29.000	1.439E+00	AC228
968.40	74.	18.86	1.98	4.214E-03	968.90	17.460	1.520E+00	AC228
1119.66	54.	20.78	1.51	3.711E-03	1120.28	15.040	1.468E+00	BI214
1332.33	8.	38.64	1.85	3.190E-03	1332.51	99.980	PBC<MDA	CO60
1460.49	384.	5.10	1.69	2.943E-03	1460.75	10.700	1.837E+01	K40

Yankee Chemistry Spectrum name: 101F_21DEC2004_1520.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1763.83	25.	20.00	1.37	2.481E-03	1764.51	15.920	9.534E-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	
174.15	87.33	200.	85.	0.043	77.45	1.014	PB-214	lD
179.34	89.93	185.	69.	0.034	91.73	1.016	PB-214	lD
418.19	209.26	195.	63.	0.032	111.73	0.914	AC-228	
539.65	269.96	139.	64.	0.032	99.09	0.714	AC-228	s
599.96	300.01	54.	36.	0.018	101.38	1.165	PB-212	lD
655.83	328.03	61.	35.	0.018	107.40	0.971	AC-228	
1720.42	860.06	10.	38.	0.019	64.15	1.466	TL-208	s

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

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.07	74.75	624.	136.	0.068	82.30	1.499
PB-214	153.79	77.11	555.	251.	0.125	44.11	1.499D
PB-212	153.79	77.11	555.	251.	0.125	44.11	1.499D
TH-234	185.93	93.18	461.	109.	0.055	88.34	1.499s
TH-234	185.89	93.16	442.	109.	0.055	86.57	1.499s
RA-226	371.69	186.02	221.	110.	0.055	64.24	1.499s
PB-212	477.11	238.71	221.	442.	0.221	20.17	1.499
RA-224	482.98	241.64	241.	90.	0.045	79.79	1.499s
PB-214	590.17	295.21	141.	134.	0.067	45.67	1.499
AC-228	676.39	338.30	75.	118.	0.059	43.52	1.075
PB-214	703.79	352.00	84.	202.	0.101	28.58	1.499
SB-125	925.82	462.96	49.	38.	0.019	92.03	1.499s
TL-208	1021.54	510.80	83.	95.	0.047	62.84	1.616s
TL-208	1165.93	582.96	54.	183.	0.091	32.07	1.246
BI-214	1218.53	609.25	42.	178.	0.089	29.39	1.217
CS-137	1323.18	661.55	46.	107.	0.053	44.82	1.313
BI-212	1455.67	727.76	22.	45.	0.023	70.24	0.974s
AC-228	1822.28	910.96	23.	123.	0.062	33.50	1.527s
AC-228	1937.22	968.40	34.	74.	0.037	56.59	1.985s
BI-214	2239.91	1119.66	22.	54.	0.027	62.35	1.509s
K-40	2922.01	1460.49	0.	384.	0.192	15.31	1.686

Yankee Chemistry Spectrum name: 101F_21DEC2004_1520.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3529.10	1763.83	0.	25.	0.013	60.00	1.374s

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

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

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	Peak COMMENTS
BE-7		3.5910E-04					
			477.56	3.591E-04	%(	7.150E-01	1.98E-01 G
K-40		1.8374E+01					
			1460.75	1.837E+01	(	3.527E-01	9.38E-01 G
MN-54		1.1557E-02					
			834.81	1.156E-02	%(	9.452E-02	2.67E-02 G
CO-57		8.7614E-03					
			122.07	8.761E-03	&(P	8.014E-02	2.37E-02 G K
			136.43	-1.237E-01	%	6.635E-01	1.98E-01 G
CO-60		3.6879E-02					
			1332.51	3.688E-02	%(P	9.718E-02	2.61E-02 G K
			1173.23	-1.209E-02	% P	1.290E-01	3.31E-02 G K
Sr-85		-2.4760E-02					
			514.00	-2.476E-02	%(	1.230E-01	3.62E-02 G
Kr-85		-4.7757E+02					
			513.99	-4.776E+02	%(	2.340E+03	6.88E+02 G
Y-88		-1.7601E-03					
			1836.01	-1.760E-03	&(P	5.259E-02	7.14E-03 G K
			898.02	-1.627E-02	% P	1.117E-01	3.10E-02 G
NB-94		-5.4598E-03					
			871.10	-5.460E-03	&(	8.426E-02	2.33E-02 G K
			702.50	3.071E-02	&	7.002E-02	2.11E-02 G K
Ag-108M		0.0000E+00					
			722.95	0.000E+00	%(	1.606E-01	4.62E-02 G K
			614.37	-3.310E-02	%	1.114E-01	3.30E-02 G
			433.93	-2.724E-03	%	7.175E-02	2.04E-02 G

Yankee Chemistry Spectrum name: 101F_21DEC2004_1520.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	1.9298E-01						
		88.04	1.930E-01	&(	2.460E+00	7.32E-01	G
SN-113	-3.7049E-03						
		391.71	-3.705E-03	&(P	1.243E-01	3.53E-02	G K
		255.04	-7.164E-02	&	3.282E+00	9.53E-01	G
SB-125	1.5053E-01						
		427.95	-3.326E-02	%(	2.349E-01	6.80E-02	G K
		600.77	5.540E-02	%	4.022E-01	1.15E-01	G
		636.15	-3.284E-02	&	6.015E-01	1.67E-01	G
		463.51	6.946E-01	(	6.454E-01	2.13E-01	G
		176.29	3.077E-01	%	9.665E-01	2.90E-01	G
I-131	9.4818E-02						
		364.48	9.482E-02	&(	3.500E-01	1.03E-01	G K
		636.97	-9.165E-02	&	4.368E+00	1.20E+00	G
		284.29	1.672E+00	%	4.615E+00	1.38E+00	G
CS-134	-3.9278E-02						
		604.66	-3.928E-02	%(	1.025E-01	3.07E-02	G K
		795.76	2.435E-03	&	1.182E-01	3.31E-02	G
		569.29	6.646E-02	%	4.664E-01	1.33E-01	G
		801.84	-2.190E-01	%	1.060E+00	3.06E-01	G
CS-137	3.2061E-01						
		661.62	3.206E-01	(	1.032E-01	4.79E-02	G
CE-139	2.3518E-02						
		165.85	2.352E-02	&(P	8.157E-02	2.44E-02	G
EU-152	-2.3684E-03						
		121.78	-2.368E-03	&(	1.915E-01	5.62E-02	G K
		344.30	-8.807E-03	&	2.160E-01	6.18E-02	G
		1408.08	6.058E-02	%	3.812E-01	1.04E-01	G
		964.00	1.162E-02	%	9.554E-01	2.70E-01	G
		1112.07	-1.047E-01	&	8.562E-01	2.42E-01	G
		778.90	-1.359E-02	%	5.965E-01	1.63E-01	G
EU-154	6.5057E-03						
		123.10	6.506E-03	&(	1.327E-01	3.90E-02	G K
		1274.80	-2.376E-02	%	3.101E-01	8.53E-02	G
		723.30	-7.344E-02	%	4.756E-01	1.37E-01	G
		1004.80	-1.999E-02	&	4.954E-01	1.35E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	-7.7490E-03						
		86.45	-7.749E-03	%(	3.027E-01	9.00E-02	G K
		105.31	1.596E-01	%	3.253E-01	9.87E-02	G
HG-203	-3.9462E-02						
		279.17	-3.946E-02	%(P	1.149E-01	3.37E-02	G K
		72.87	-4.989E-01	%	2.689E+00	8.06E-01	G
		70.83	-1.313E+00	&	4.566E+00	1.37E+00	G
		82.50	9.051E-02	&	4.885E+00	1.44E+00	G
TL-208	4.7958E-01						
		583.14	4.796E-01	(	9.684E-02	5.13E-02	G
		510.72	8.362E-01	+	3.989E-01	1.75E-01	G
PB-212	9.9238E-01						
		238.63	9.924E-01	(	1.615E-01	6.67E-02	G K
							Energy duplication
		77.11	1.255E+00	+	5.628E-01	1.85E-01	G
		74.81	1.287E+00	&	1.130E+00	3.53E-01	G
PB-214	7.7185E-01						
		351.99	7.502E-01	(	1.688E-01	7.15E-02	G K
		295.22	8.137E-01	(	3.525E-01	1.24E-01	G
							Energy duplication
		77.11	2.053E+00	+	9.204E-01	3.02E-01	G
		241.92	-2.523E-02	%	1.345E+00	3.98E-01	G
BI-212	1.0555E+00						
		727.17	1.056E+00	@(	5.763E-01	2.47E-01	G K
		1620.56	2.937E-02	%	3.165E+00	7.96E-01	G
		785.42	1.099E+00	%	3.536E+00	1.03E+00	G
BI-214	9.1914E-01						
		609.32	9.073E-01	(	1.677E-01	8.89E-02	G K
		1764.51	9.534E-01	(	2.811E-01	1.91E-01	G
		1120.28	1.468E+00	+	6.578E-01	3.05E-01	G
RA-224	2.2480E+00						
		241.00	2.248E+00	(	1.877E+00	5.98E-01	G
RA-226	2.7114E+00						
		185.99	2.711E+00	*(	1.779E+00	5.81E-01	G
AC-228	1.4348E+00						
		911.07	1.439E+00	*(	2.916E-01	1.61E-01	G K
		968.90	1.520E+00	(	6.105E-01	2.87E-01	G
		338.40	1.300E+00	(	4.772E-01	1.88E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	0.0000E+00						
		236.00	0.000E+00	%(	7.607E-01	2.24E-01	G K
		256.25	1.680E-01	&	8.619E-01	2.54E-01	G
PA-234	4.1472E-04						
		98.44	4.147E-04	%(	2.847E-01	8.40E-02	G K
		946.00	-4.326E-02	&	4.909E-01	1.37E-01	G
		131.28	3.807E-03	&	3.501E-01	1.03E-01	G
		94.67	-2.203E-01	%	5.392E-01	1.63E-01	G
		883.24	-6.401E-02	&	7.721E-01	2.16E-01	G
		926.70	0.000E+00	&	9.829E-01	2.73E-01	G
		569.26	9.698E-02	%	6.805E-01	1.94E-01	G
TH-234	2.1095E+00						
		63.29	8.796E-01	%(	3.790E+00	1.14E+00	G K
		92.80	2.758E+00	*(	2.542E+00	7.96E-01	G
		92.38	3.219E+00	*(	3.034E+00	9.48E-01	G
AM-241	-1.8015E-02						
		59.54	-1.801E-02	&(P	5.033E-01	1.49E-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

- -

***** 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	2.8363E-04	3.5910E-04	5.9464E-01	5.9464E-01	5.647E-01
K-40		1.8374E+01	1.8374E+01	2.8130E+00	2.9985E+00	
MN-54	#A	1.1100E-02	1.1557E-02	8.0147E-02	8.0150E-02	9.078E-02
CO-57	#B	8.3619E-03	8.7614E-03	7.1234E-02	7.1236E-02	7.649E-02
CO-60	#B	3.6639E-02	3.6879E-02	7.8429E-02	7.8456E-02	9.655E-02
Sr-85	#A	-2.0387E-02	-2.4760E-02	1.0850E-01	1.0850E-01	1.013E-01
Kr-85	#A	-4.7751E+02	-4.7757E+02	2.0644E+03	2.0646E+03	2.339E+03
Y-88	#B	-1.5639E-03	-1.7601E-03	1.0561E-02	1.0561E-02	4.673E-02
NB-94	#B	-5.4598E-03	-5.4598E-03	6.9838E-02	6.9838E-02	8.426E-02
Ag-108M	#B	0.0000E+00	0.0000E+00	1.3872E-01	1.3872E-01	1.606E-01
CD-109	#A	1.8769E-01	1.9298E-01	2.1959E+00	2.1959E+00	2.393E+00
SN-113	#B	-3.3207E-03	-3.7049E-03	1.4320E+00	1.4320E+00	1.114E-01
SB-125	#B	1.4867E-01	1.5053E-01	1.3853E-01	1.3879E-01	2.320E-01
I-131	#B	1.9783E-02	9.4818E-02	3.0970E-01	3.0975E-01	7.302E-02
CS-134	#B	-3.8626E-02	-3.9278E-02	9.2108E-02	9.2135E-02	1.008E-01
CS-137		3.2024E-01	3.2061E-01	1.4371E-01	1.4485E-01	
CE-139	#A	2.1459E-02	2.3518E-02	7.3203E-02	7.3215E-02	7.443E-02
EU-152	#B	-2.3620E-03	-2.3684E-03	1.6852E-01	1.6852E-01	1.910E-01
EU-154	#B	6.4794E-03	6.5057E-03	1.1691E-01	1.1691E-01	1.322E-01
EU-155	#B	-7.6953E-03	-7.7490E-03	2.6995E-01	2.6995E-01	3.006E-01
HG-203	#B	-3.0111E-02	-3.9462E-02	1.6168E-01	1.6170E-01	8.766E-02
TL-208		4.7958E-01	4.7958E-01	1.5382E-01	1.5619E-01	
PB-212	#	9.9238E-01	9.9238E-01	2.0018E-01	2.0788E-01	1.615E-01
PB-214	#	7.7185E-01	7.7185E-01	2.0792E-01	2.1245E-01	1.688E-01
BI-212	#	1.0555E+00	1.0555E+00	7.4138E-01	7.4378E-01	
BI-214		9.1914E-01	9.1914E-01	2.7010E-01	2.7504E-01	
RA-224	#	2.2480E+00	2.2480E+00	1.7938E+00	1.7983E+00	1.877E+00
RA-226	#	2.7113E+00	2.7114E+00	1.7418E+00	1.7486E+00	1.779E+00
AC-228		1.4348E+00	1.4348E+00	3.7714E-01	3.8575E-01	
TH-227	#B	0.0000E+00	0.0000E+00	6.7146E-01	6.7146E-01	7.607E-01
PA-234	#B	4.1472E-04	4.1472E-04	2.5199E-01	2.5199E-01	2.847E-01
TH-234	#B	2.1095E+00	2.1095E+00	1.8263E+00	1.8300E+00	3.790E+00
AM-241	#A	-1.8013E-02	-1.8015E-02	5.1404E-01	5.1405E-01	5.033E-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

Yankee Chemistry Spectrum name: 101F_21DEC2004_1520.An1

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

Total Activity (50.2 to 1999.1 keV) 2.2583616E+01 pCi/gm
Total Decayed Activity (50.2 to 1999.1 keV) 2.2583984E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101f_21dec2004_1555.An1

Sample description
Detector 101 FSS OOL-04-01-016-F

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101f_21dec2004_1555.An1

Acquisition information
Start time: 21-Dec-2004 15:49:36
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: 1.0450E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.0450E+03) =
9.5694E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101f_21dec2004_1555.An1

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	03-Dec-2004 12:11:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1083

***** 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
63.36	78.	41.42	1.24	1.124E-02	63.29	3.900	2.325E+00	TH234
74.74	157.	24.56	1.50	1.654E-02	74.81	9.600	1.277E+00	PB212
77.05	195.	19.17	1.50	1.720E-02	77.11	17.500	8.354E-01	PB212
					77.11	10.700	1.366E+00	PB214
77.05	195.	19.17	1.50	1.720E-02	77.11	17.500	8.354E-01	PB212
					77.11	10.700	1.366E+00	PB214
93.40	91.	28.84	1.72	1.995E-02	92.38	2.570	2.307E+00	TH234
					92.80	3.000	1.972E+00	TH234
185.99	104.	23.01	1.33	1.858E-02				
185.99	104.	23.01	1.33	1.858E-02	185.99	3.280	2.196E+00	RA226
208.61	63.	38.70	0.98	1.725E-02				
238.71	560.	4.90	1.12	1.557E-02	238.63	43.100	1.079E+00	PB212
241.69	93.	20.09	1.12	1.541E-02	241.00	3.900	1.986E+00	RA224
					241.92	7.470	1.040E+00	PB214
270.68	41.	35.76	1.07	1.398E-02				
295.22	122.	13.52	1.23	1.292E-02				
295.22	122.	13.52	1.23	1.292E-02	295.22	19.200	6.360E-01	PB214
327.13	38.	38.87	0.94	1.173E-02				
338.51	84.	21.47	0.93	1.135E-02	338.40	12.010	7.931E-01	AC228
351.80	212.	10.80	1.16	1.093E-02				
351.80	212.	10.80	1.16	1.093E-02	351.99	37.100	6.764E-01	PB214
462.82	34.	36.50	1.17	8.354E-03				
462.82	34.	36.50	1.17	8.354E-03	463.51	10.000	5.337E-01	SB125
510.70	86.	17.70	1.56	7.591E-03	510.72	22.500	6.512E-01	TL208
583.17	146.	13.37	1.39	6.684E-03	583.14	86.000	3.293E-01	TL208
609.20	207.	10.14	1.20	6.414E-03	609.32	46.090	9.057E-01	BI214

661.26	133.	13.22	1.24	5.940E-03	661.62	84.620	3.427E-01	CS137
727.23	60.	26.20	1.07	5.443E-03	727.17	11.800	1.208E+00	BI212
910.83	101.	13.70	1.73	4.448E-03	911.07	29.000	1.017E+00	AC228
968.58	75.	17.26	1.41	4.213E-03	968.90	17.460	1.312E+00	AC228
1120.16	55.	21.04	2.32	3.711E-03	1120.28	15.040	1.270E+00	BI214
1460.48	417.	4.97	1.74	2.943E-03	1460.75	10.700	1.713E+01	K40

Yankee Chemistry Spectrum name: 101f_21dec2004_1555.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1764.46	25.	20.00	1.25	2.481E-03	1764.51	15.920	8.184E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
126.28	63.36	392.	78.	0.039	124.26	1.238	PA-234	l
416.90	208.61	218.	63.	0.031	116.09	0.976	LU-177	
477.11	238.67	97.	560.	0.280	14.71	1.122	PB-212	D
483.08	241.65	126.	93.	0.046	60.28	1.124	PB-214	D
541.08	270.68	87.	41.	0.021	107.29	1.065	AC-228	s
654.04	327.13	74.	38.	0.019	116.61	0.939	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	149.05	74.74	663.	157.	0.078	73.67	1.499
PB-212	153.79	77.11	598.	195.	0.097	57.52	1.499D
PB-214	153.79	77.11	598.	195.	0.097	57.52	1.499D
TH-234	185.82	93.12	533.	124.	0.062	83.20	1.499s
TH-234	185.79	93.11	519.	122.	0.061	83.63	1.499s
RA-226	371.64	185.99	257.	103.	0.051	72.63	1.499D
PB-212	477.05	238.68	254.	408.	0.204	22.27	1.499
RA-224	483.19	241.74	318.	80.	0.040	100.70	1.499
PB-214	590.19	295.22	121.	131.	0.066	44.15	1.499D
AC-228	676.80	338.51	88.	84.	0.042	64.42	0.929
PB-214	703.67	351.94	65.	185.	0.092	28.75	1.499
SB-125	925.82	462.96	47.	29.	0.014	115.32	1.499
TL-208	1021.35	510.70	56.	86.	0.043	53.09	1.558s
TL-208	1166.35	583.17	70.	146.	0.073	40.11	1.390
BI-214	1218.44	609.20	65.	207.	0.104	30.43	1.200
CS-137	1322.60	661.26	55.	133.	0.067	39.65	1.237
BI-212	1454.61	727.23	52.	60.	0.030	78.61	1.074
AC-228	1822.00	910.83	29.	101.	0.051	41.09	1.729
AC-228	1937.58	968.58	29.	75.	0.037	51.77	1.412
BI-214	2240.91	1120.16	25.	55.	0.027	63.12	2.321s
K-40	2921.98	1460.48	3.	417.	0.208	14.90	1.742
BI-214	3530.36	1764.46	0.	25.	0.013	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		0.0000E+00						
			477.56	0.000E+00	&(	7.270E-01	2.04E-01	G
K-40		1.7127E+01						
			1460.75	1.713E+01	(	4.428E-01	8.51E-01	G
MN-54		0.0000E+00						
			834.81	0.000E+00	%(	8.791E-02	2.44E-02	G
CO-57		-3.3103E-03						
			122.07	-3.310E-03	%(P	7.716E-02	2.28E-02	G K
			136.43	-9.138E-02	%	6.035E-01	1.80E-01	G
CO-60		-3.2345E-02						
			1332.51	-3.235E-02	%(P	1.159E-01	2.87E-02	G K
			1173.23	2.492E-02	% P	1.080E-01	2.98E-02	G K
Sr-85		-3.9915E-02						
			514.00	-3.991E-02	%(	1.101E-01	3.30E-02	G
Kr-85		-7.5931E+02						
			513.99	-7.593E+02	%(	2.095E+03	6.27E+02	G
Y-88		-1.1151E-02						
			1836.01	-1.115E-02	%(P	8.840E-02	2.27E-02	G K
			898.02	-4.740E-03	% P	8.600E-02	2.30E-02	G
NB-94		4.7615E-03						
			871.10	4.761E-03	%(	6.027E-02	1.64E-02	G K
			702.50	-7.129E-03	&	7.374E-02	2.09E-02	G K
Ag-108M		-1.4002E-03						
			722.95	-1.400E-03	&(	1.049E-01	2.97E-02	G K
			614.37	-2.406E-02	%	8.393E-02	2.47E-02	G
			433.93	0.000E+00	%	7.572E-02	2.16E-02	G
CD-109		1.3106E-02						
			88.04	1.311E-02	%(	2.180E+00	6.47E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	1.1945E-02						
		391.71	1.195E-02	%(P	1.065E-01	3.08E-02	G K
		255.04	6.456E-03	%	2.458E+00	7.07E-01	G
SB-125	1.3203E-01						
		427.95	2.347E-02	%(	2.060E-01	5.95E-02	G K
		600.77	4.431E-02	&	3.532E-01	1.01E-01	G
		636.15	1.285E-01	%	4.513E-01	1.31E-01	G
		463.51	4.534E-01	(	5.450E-01	1.74E-01	G
		176.29	-1.073E-01	%	9.193E-01	2.72E-01	G
I-131	-2.7747E-02						
		364.48	-2.775E-02	&(	3.327E-01	9.61E-02	G K
		636.97	-2.524E-01	&	3.894E+00	1.08E+00	G
		284.29	1.715E+00	%	3.734E+00	1.13E+00	G
CS-134	-6.6609E-03						
		604.66	-6.661E-03	%(	2.020E-01	5.97E-02	G K
		795.76	3.295E-02	%	8.844E-02	2.63E-02	G
		569.29	1.675E-01	%	3.527E-01	1.07E-01	G
		801.84	0.000E+00	%	8.569E-01	2.35E-01	G
CS-137	3.4271E-01						
		661.62	3.427E-01	(	9.603E-02	4.53E-02	G
CE-139	-3.0899E-03						
		165.85	-3.090E-03	%(P	7.621E-02	2.24E-02	G
EU-152	0.0000E+00						
		121.78	0.000E+00	%(	2.163E-01	6.39E-02	G K
		344.30	2.673E-03	%	1.764E-01	5.01E-02	G
		1408.08	9.597E-02	%	2.608E-01	7.65E-02	G
		964.00	-1.817E-02	&	6.412E-01	1.78E-01	G
		1112.07	-1.928E-02	%	5.643E-01	1.52E-01	G
		778.90	-6.218E-02	%	5.823E-01	1.64E-01	G
EU-154	-1.8296E-02						
		123.10	-1.830E-02	&(	1.395E-01	4.14E-02	G K
		1274.80	-4.369E-02	%	2.937E-01	8.30E-02	G
		723.30	-1.611E-01	&	5.300E-01	1.57E-01	G
		1004.80	-5.063E-02	&	5.106E-01	1.43E-01	G
EU-155	1.6835E-01						
		86.45	1.684E-01	%(	2.473E-01	7.57E-02	G K
		105.31	9.782E-02	%	2.841E-01	8.55E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	-7.7143E-03						
		279.17	-7.714E-03	&(P	9.538E-02	2.73E-02	G K
		72.87	-4.100E-01	%	2.122E+00	6.36E-01	G
		70.83	-1.753E-01	%	2.856E+00	8.44E-01	G
		82.50	-1.354E+00	&	4.986E+00	1.50E+00	G
TL-208	3.2933E-01						
		583.14	3.293E-01	(	9.355E-02	4.40E-02	G
		510.72	6.512E-01	+	2.846E-01	1.15E-01	G
PB-212	7.9982E-01						
		238.63	7.854E-01	(	1.484E-01	5.83E-02	G K
							Energy duplication
		77.11	8.354E-01	(	5.012E-01	1.60E-01	G
		74.81	1.277E+00	&	9.990E-01	3.14E-01	G
PB-214	6.2198E-01						
		351.99	5.899E-01	(	1.281E-01	5.65E-02	G K
							Energy duplication
		295.22	6.840E-01	(	2.811E-01	1.01E-01	G
							Energy duplication
		77.11	1.366E+00	+	8.197E-01	2.62E-01	G
		241.92	5.162E-01	%	1.045E+00	3.17E-01	G
BI-212	1.2081E+00						
		727.17	1.208E+00	(	7.312E-01	3.17E-01	G K
		1620.56	0.000E+00	%	1.292E+00	1.75E-01	G
		785.42	5.377E-01	%	3.642E+00	1.03E+00	G
BI-214	8.8327E-01						
		609.32	9.057E-01	(	1.762E-01	9.19E-02	G K
		1764.51	8.184E-01	(	2.413E-01	1.64E-01	G
		1120.28	1.270E+00	+	6.048E-01	2.67E-01	G
RA-224	1.7100E+00						
		241.00	1.710E+00	(	1.841E+00	5.74E-01	G
RA-226	2.1773E+00						
							Energy duplication
		185.99	2.177E+00	*(	1.643E+00	5.27E-01	G
AC-228	1.1277E+00						
		911.07	1.017E+00	(	2.771E-01	1.39E-01	G K
		968.90	1.312E+00	(	4.919E-01	2.26E-01	G
		338.40	7.931E-01	-	4.414E-01	1.70E-01	G
TH-227	-9.6096E-02						
		236.00	-9.610E-02	%(	6.601E-01	1.96E-01	G K
		256.25	-3.511E-03	&	8.306E-01	2.41E-01	G

Yankee Chemistry Spectrum name: 101f_21dec2004_1555.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-234	-1.1580E-03						
		98.44	-1.158E-03	%(	2.536E-01	7.49E-02	G K
		946.00	-1.807E-02	%	3.815E-01	1.05E-01	G
		131.28	-8.287E-02	%	3.074E-01	9.21E-02	G
		94.67	-1.141E-01	%	4.409E-01	1.32E-01	G
		883.24	1.296E-01	%	6.705E-01	1.92E-01	G
		926.70	-6.136E-02	&	7.242E-01	2.02E-01	G
		569.26	2.449E-01	%	5.143E-01	1.56E-01	G
TH-234	2.4584E+00						
		63.29	1.853E+00	%(	3.067E+00	9.36E-01	G K
		92.80	2.649E+00	(	2.360E+00	7.38E-01	G
		92.38	3.155E+00	&(	2.797E+00	8.75E-01	G
AM-241	-7.3271E-02						
		59.54	-7.327E-02	%(P	4.450E-01	1.33E-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	6.1346E-01	6.1347E-01	5.744E-01
K-40		1.7127E+01	1.7127E+01	2.5522E+00	2.7295E+00	
MN-54	#A	0.0000E+00	0.0000E+00	7.3120E-02	7.3120E-02	8.443E-02
CO-57	#B	-3.1596E-03	-3.3103E-03	1.2662E-01	1.2662E-01	7.365E-02
CO-60	#B	-3.2135E-02	-3.2345E-02	8.5245E-01	8.5245E-01	1.152E-01
Sr-85	#A	-3.2875E-02	-3.9915E-02	9.8987E-02	9.9013E-02	9.072E-02
Kr-85	#A	-7.5921E+02	-7.5931E+02	1.8824E+03	1.8829E+03	2.094E+03
Y-88	#B	-9.9092E-03	-1.1151E-02	8.9450E-02	8.9452E-02	7.856E-02
NB-94	#B	4.7615E-03	4.7615E-03	4.9213E-02	4.9213E-02	6.027E-02
Ag-108M	#B	-1.3998E-03	-1.4002E-03	8.9241E-02	8.9241E-02	1.049E-01
CD-109	#A	1.2747E-02	1.3106E-02	1.9408E+00	1.9408E+00	2.121E+00
SN-113	#B	1.0708E-02	1.1945E-02	9.2319E-02	9.2321E-02	9.544E-02
SB-125	#B	1.3040E-01	1.3203E-01	1.5226E-01	1.5244E-01	2.035E-01
I-131	#B	-5.8020E-03	-2.7747E-02	2.8826E-01	2.8827E-01	6.957E-02
CS-134	#B	-6.5505E-03	-6.6609E-03	1.7915E-01	1.7915E-01	1.987E-01
CS-137		3.4232E-01	3.4271E-01	1.3589E-01	1.3726E-01	
CE-139	#A	-2.8197E-03	-3.0899E-03	7.3045E-02	7.3045E-02	6.955E-02
EU-152	#B	0.0000E+00	0.0000E+00	1.9176E-01	1.9176E-01	2.157E-01
EU-154	#B	-1.8222E-02	-1.8296E-02	1.2426E-01	1.2426E-01	1.389E-01
EU-155	#B	1.6719E-01	1.6835E-01	2.2705E-01	2.2725E-01	2.456E-01
HG-203	#B	-5.8886E-03	-7.7143E-03	1.5752E+01	1.5752E+01	7.280E-02
TL-208		3.2933E-01	3.2933E-01	1.3208E-01	1.3338E-01	
PB-212	#	7.9982E-01	7.9982E-01	1.7815E-01	1.8380E-01	1.484E-01
PB-214	#	6.2198E-01	6.2198E-01	1.6384E-01	1.6757E-01	1.281E-01
BI-212		1.2081E+00	1.2081E+00	9.4969E-01	9.5214E-01	
BI-214		8.8327E-01	8.8327E-01	2.6882E-01	2.7342E-01	
RA-224	#A	1.7100E+00	1.7100E+00	1.7220E+00	1.7247E+00	1.841E+00
RA-226	#	2.1773E+00	2.1773E+00	1.5813E+00	1.5861E+00	1.643E+00
AC-228		1.1277E+00	1.1277E+00	3.7269E-01	3.7810E-01	
TH-227	#B	-9.6096E-02	-9.6096E-02	5.8832E-01	5.8835E-01	6.601E-01
PA-234	#B	-1.1580E-03	-1.1580E-03	2.2470E-01	2.2470E-01	2.536E-01
TH-234	#B	2.4584E+00	2.4584E+00	1.5738E+00	1.5797E+00	3.067E+00
AM-241	#A	-7.3266E-02	-7.3271E-02	4.1008E-01	4.1010E-01	4.450E-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

Yankee Chemistry Spectrum name: 101f_21dec2004_1555.An1

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

Total Activity (270.6 to 1999.1 keV) 2.1018148E+01 pCi/gm
Total Decayed Activity (270.6 to 1999.1 keV) 2.1018541E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_21DEC2004_1630.An1

Sample description
Detector 101 FSS OOL-04-01-024-F

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_21DEC2004_1630.An1

Acquisition information
Start time: 21-Dec-2004 16:25:41
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: 9.8800E+02
Activity scaling factor: 1.0000E+06/(1.0000E+00* 9.8800E+02) =
1.0121E+03
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_21DEC2004_1630.An1

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	06-Dec-2004 11:55:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2099

***** 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	69.	33.76	1.43	1.105E-02				
63.07	69.	33.76	1.43	1.105E-02	63.29	3.900	2.171E+00	TH234
74.78	122.	28.49	1.50	1.654E-02	74.81	9.600	1.047E+00	PB212
74.97	145.	15.70	1.00	1.664E-02	74.81	9.600	1.252E+00	PB212
76.94	199.	12.32	1.01	1.720E-02	77.11	17.500	9.028E-01	PB212
					77.11	10.700	1.477E+00	PB214
77.01	171.	19.02	1.50	1.720E-02	77.11	17.500	7.758E-01	PB212
					77.11	10.700	1.269E+00	PB214
92.84	99.	29.92	1.50	1.985E-02	88.04	3.790	PBC<MDA	CD109
					92.38	2.570	2.651E+00	TH234
					92.80	3.000	2.266E+00	TH234
					94.67	15.500	4.346E-01	PA234
92.86	77.	38.06	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.770E+00	TH234
					94.67	15.500	3.395E-01	PA234
186.36	76.	26.93	1.04	1.856E-02	185.99	3.280	1.701E+00	RA226
238.72	395.	5.91	1.12	1.557E-02	238.63	43.100	8.039E-01	PB212
241.44	60.	27.07	1.12	1.543E-02	241.00	3.900	1.362E+00	RA224
					241.92	7.470	7.135E-01	PB214
295.17	165.	15.92	0.92	1.292E-02	295.22	19.200	9.098E-01	PB214
338.49	93.	20.51	1.16	1.135E-02	338.40	12.010	9.322E-01	AC228
351.94	234.	7.76	1.45	1.093E-02	351.99	37.100	7.890E-01	PB214
463.34	51.	24.51	1.47	8.345E-03				
463.34	51.	24.51	1.47	8.345E-03	463.51	10.000	8.433E-01	SB125
510.70	63.	25.37	1.22	7.591E-03	510.72	22.500	5.045E-01	TL208
582.81	122.	12.18	1.52	6.688E-03	583.14	86.000	2.891E-01	TL208

609.12	175.	9.31	1.44	6.415E-03	609.32	46.090	8.117E-01	BI214
660.93	28.	35.32	1.48	5.943E-03				

Yankee Chemistry Spectrum name: 101F_21DEC2004_1630.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
660.93	28.	35.32	1.48	5.943E-03	661.62	84.620	7.712E-02	CS137
727.06	24.	36.70	1.50	5.443E-03	727.17	11.800	PBC<MDA	BI212
910.82	70.	20.65	1.43	4.448E-03	911.07	29.000	7.446E-01	AC228
968.74	51.	23.08	1.26	4.212E-03	968.90	17.460	9.485E-01	AC228
1120.04	42.	27.55	1.14	3.712E-03	1120.28	15.040	1.019E+00	BI214
1172.31	11.	38.97	1.75	3.565E-03	1173.23	99.860	PBC<MDA	CO60
1460.56	306.	5.86	1.76	2.943E-03	1460.75	10.700	1.332E+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	
125.69	63.07	228.	69.	0.035	101.29	1.425	PA-234	l
149.51	75.14	188.	145.	0.073	47.10	1.005	PB-214	D
477.13	238.72	74.	395.	0.197	17.72	1.122	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	149.13	74.78	538.	122.	0.061	85.48	1.499
PB-212	153.79	77.11	442.	171.	0.085	57.06	1.499D
PB-214	153.79	77.11	200.	199.	0.099	36.96	1.006D
TH-234	185.27	92.84	388.	99.	0.049	89.77	1.499s
TH-234	185.30	92.86	393.	77.	0.039	114.18	1.499s
RA-226	371.63	185.99	196.	72.	0.036	90.12	1.499
PB-212	477.12	238.71	218.	300.	0.150	27.12	1.499
RA-224	483.33	241.81	235.	58.	0.029	118.83	1.499
PB-214	483.54	241.92	79.	69.	0.035	65.14	1.124D
PB-214	590.09	295.17	150.	165.	0.083	47.76	0.917s
AC-228	676.76	338.49	93.	93.	0.046	61.52	1.165
PB-214	703.67	351.94	43.	234.	0.117	23.27	1.449s
SB-125	926.02	463.06	34.	31.	0.016	95.79	1.499
TL-208	1021.35	510.70	55.	63.	0.032	76.12	1.222s
TL-208	1165.63	582.81	32.	122.	0.061	36.55	1.516
BI-214	1218.27	609.12	28.	175.	0.088	27.92	1.439s
CS-137	1322.93	661.42	21.	23.	0.011	107.08	1.499
BI-212	1454.27	727.06	26.	24.	0.012	110.11	1.499
AC-228	1821.99	910.82	38.	70.	0.035	61.94	1.428

Yankee Chemistry Spectrum name: 101F_21DEC2004_1630.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1937.89	968.74	25.	51.	0.025	69.23	1.261
BI-214	2240.67	1120.04	26.	42.	0.021	82.65	1.137s
K-40	2922.13	1460.56	4.	306.	0.153	17.57	1.759

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		2.7352E-01					
			477.56	2.735E-01	&(	6.429E-01 1.93E-01	G
K-40		1.3315E+01					
			1460.75	1.332E+01	(	4.965E-01 7.80E-01	G
MN-54		2.1935E-02					
			834.81	2.193E-02	%(	7.569E-02 2.21E-02	G
CO-57		3.0816E-03					
			122.07	3.082E-03	%(P	6.164E-02 1.81E-02	G K
			136.43	4.750E-02	&	4.985E-01 1.47E-01	G
CO-60		1.0354E-02					
			1332.51	1.035E-02	%(P	9.947E-02 2.52E-02	G K
			1173.23	4.220E-02	% P	9.514E-02 2.68E-02	G K
Sr-85		-2.4937E-02					
			514.00	-2.494E-02	%(	8.954E-02 2.64E-02	G
Kr-85		-4.8945E+02					
			513.99	-4.895E+02	%(	1.758E+03 5.19E+02	G
Y-88		-1.5672E-03					
			1836.01	-1.567E-03	%(P	4.683E-02 6.35E-03	G K
			898.02	-9.409E-03	% P	7.884E-02 2.11E-02	G
NB-94		-2.8354E-03					
			871.10	-2.835E-03	&(	7.099E-02 1.93E-02	G K
			702.50	1.579E-02	%	5.798E-02 1.68E-02	G K
Ag-108M		-7.3771E-03					
			722.95	-7.377E-03	%(	7.569E-02 2.12E-02	G K
			614.37	-3.202E-02	%	7.813E-02 2.34E-02	G
			433.93	-6.137E-03	%	5.990E-02 1.71E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	6.8054E-01						
		88.04	6.805E-01	%(	1.575E+00	4.76E-01	G
SN-113	-2.8484E-03						
		391.71	-2.848E-03	%(P	9.419E-02	2.64E-02	G K
		255.04	-3.640E-01	%	2.663E+00	7.79E-01	G
SB-125	8.3170E-02						
		427.95	-6.427E-02	%(	2.157E-01	6.39E-02	G K
		600.77	-1.926E-02	%	2.953E-01	8.15E-02	G
		636.15	1.203E-01	&	5.448E-01	1.57E-01	G
		463.51	5.196E-01	(	4.981E-01	1.66E-01	G
		176.29	-1.090E-02	%	7.769E-01	2.27E-01	G
I-131	2.6260E-02						
		364.48	2.626E-02	%(	2.582E-01	7.45E-02	G K
		636.97	6.216E-01	&	3.054E+00	8.75E-01	G
		284.29	-6.929E-02	%	3.127E+00	9.00E-01	G
CS-134	7.7009E-04						
		604.66	7.701E-04	&(	4.949E-02	1.33E-02	G K
		795.76	4.685E-02	&	6.763E-02	2.17E-02	G
		569.29	7.961E-02	%	3.407E-01	9.81E-02	G
		801.84	-1.370E-01	&	8.828E-01	2.51E-01	G
CS-137	6.1492E-02						
		661.62	6.149E-02	(	6.579E-02	2.19E-02	G
CE-139	1.3557E-02						
		165.85	1.356E-02	%(P	7.414E-02	2.20E-02	G
EU-152	1.2789E-02						
		121.78	1.279E-02	%(	1.766E-01	5.20E-02	G K
		344.30	3.627E-03	&	1.884E-01	5.36E-02	G
		1408.08	0.000E+00	%	3.462E-01	8.76E-02	G
		964.00	-3.983E-03	%	5.519E-01	1.50E-01	G
		1112.07	1.781E-01	%	5.769E-01	1.68E-01	G
		778.90	1.133E-02	%	5.127E-01	1.39E-01	G
EU-154	1.2057E-02						
		123.10	1.206E-02	&(	1.167E-01	3.44E-02	G K
		1274.80	1.538E-01	%	2.403E-01	7.62E-02	G
		723.30	-4.107E-02	&	3.401E-01	9.55E-02	G
		1004.80	-6.729E-02	%	4.813E-01	1.35E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	4.2284E-02						
		86.45	4.228E-02	%(	1.916E-01	5.72E-02	G K
		105.31	5.492E-02	%	2.697E-01	8.04E-02	G
HG-203	-2.6283E-02						
		279.17	-2.628E-02	&(P	9.100E-02	2.64E-02	G K
		72.87	1.794E-02	&	2.499E+00	7.45E-01	G
		70.83	1.066E+00	%	2.293E+00	6.95E-01	G
		82.50	-8.033E-01	%	4.017E+00	1.20E+00	G
TL-208	2.8908E-01						
		583.14	2.891E-01	(	6.868E-02	3.52E-02	G
		510.72	5.045E-01	+	2.985E-01	1.28E-01	G
PB-212	6.1177E-01						
		238.63	6.118E-01	(	1.457E-01	5.53E-02	G K
							Energy duplication
		77.11	7.758E-01	+	4.575E-01	1.48E-01	G
		74.81	1.047E+00	&	9.548E-01	2.98E-01	G
PB-214	8.2950E-01						
		351.99	7.890E-01	(	1.125E-01	6.12E-02	G K
		295.22	9.098E-01	@(	3.296E-01	1.45E-01	G
							Energy duplication
		77.11	1.477E+00	+	5.101E-01	1.82E-01	G
		241.92	8.243E-01	(	5.236E-01	1.79E-01	G
BI-212	5.0542E-01						
		727.17	5.054E-01	(	5.644E-01	1.85E-01	G K
		1620.56	6.882E-01	%	2.746E+00	7.69E-01	G
		785.42	2.432E-01	%	3.324E+00	9.16E-01	G
BI-214	8.6282E-01						
		609.32	8.117E-01	@(	1.258E-01	7.55E-02	G K
		1764.51	4.106E-01	%	5.465E-01	1.82E-01	G
		1120.28	1.019E+00	(	6.532E-01	2.81E-01	G
RA-224	1.3163E+00						
		241.00	1.316E+00	(	1.682E+00	5.21E-01	G
RA-226	1.6084E+00						
		185.99	1.608E+00	(	1.525E+00	4.83E-01	G
AC-228	8.4402E-01						
		911.07	7.446E-01	(	3.326E-01	1.54E-01	G K
		968.90	9.485E-01	(	4.837E-01	2.19E-01	G
		338.40	9.322E-01	(	4.784E-01	1.91E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-2.6766E-03						
		236.00	-2.677E-03	%(	4.932E-01	1.43E-01	G K
		256.25	0.000E+00	&	7.861E-01	2.27E-01	G
PA-234	-4.1719E-02						
		98.44	-4.172E-02	%(	2.364E-01	7.04E-02	G K
		946.00	3.372E-02	%	4.049E-01	1.12E-01	G
		131.28	-1.943E-02	%	2.672E-01	7.88E-02	G
		94.67	1.253E-03	%	3.686E-01	1.08E-01	G
		883.24	7.606E-02	%	5.907E-01	1.65E-01	G
		926.70	4.316E-03	%	6.622E-01	1.78E-01	G
		569.26	1.115E-01	%	5.007E-01	1.44E-01	G
TH-234	2.0606E+00						
		63.29	1.895E+00	%(	2.905E+00	8.90E-01	G K
		92.80	1.770E+00	(	2.180E+00	6.74E-01	G
		92.38	2.651E+00	&(	2.535E+00	7.93E-01	G
AM-241	-1.0530E-02						
		59.54	-1.053E-02	&(P	4.330E-01	1.28E-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

Yankee Chemistry Spectrum name: 101F_21DEC2004_1630.An1

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

- -

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

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	2.2458E-01	2.7352E-01	5.8008E-01	5.8028E-01	5.278E-01
K-40		1.3315E+01	1.3315E+01	2.3396E+00	2.4576E+00	
MN-54	#A	2.1207E-02	2.1935E-02	6.6193E-02	6.6204E-02	7.318E-02
CO-57	#B	2.9637E-03	3.0816E-03	5.4316E-02	5.4316E-02	5.928E-02
CO-60	#B	1.0298E-02	1.0354E-02	7.5540E-02	7.5543E-02	9.893E-02
Sr-85	#A	-2.1199E-02	-2.4937E-02	7.9324E-02	7.9336E-02	7.612E-02
Kr-85	#A	-4.8940E+02	-4.8945E+02	1.5570E+03	1.5572E+03	1.757E+03
Y-88	#B	-1.4199E-03	-1.5672E-03	9.4034E-03	9.4038E-03	4.242E-02
NB-94	#B	-2.8354E-03	-2.8354E-03	5.7995E-02	5.7995E-02	7.099E-02
Ag-108M	#B	-7.3754E-03	-7.3771E-03	6.3553E-02	6.3555E-02	7.567E-02
CD-109	#A	6.6491E-01	6.8054E-01	1.4281E+00	1.4286E+00	1.539E+00
SN-113	#B	-2.5994E-03	-2.8484E-03	1.8992E-01	1.8992E-01	8.596E-02
SB-125	#B	8.2309E-02	8.3170E-02	7.9668E-02	7.9807E-02	2.135E-01
I-131	#B	7.0898E-03	2.6260E-02	2.2361E-01	2.2362E-01	6.970E-02
CS-134	#B	7.5940E-04	7.7009E-04	3.9825E-02	3.9825E-02	4.881E-02
CS-137	#A	6.1433E-02	6.1492E-02	6.5847E-02	6.5938E-02	6.573E-02
CE-139	#A	1.2557E-02	1.3557E-02	6.6051E-02	6.6055E-02	6.867E-02
EU-152	#B	1.2760E-02	1.2789E-02	1.5611E-01	1.5611E-01	1.762E-01
EU-154	#B	1.2016E-02	1.2057E-02	1.0312E-01	1.0312E-01	1.163E-01
EU-155	#B	4.2039E-02	4.2284E-02	1.7145E-01	1.7147E-01	1.905E-01
HG-203	#B	-2.0967E-02	-2.6283E-02	1.4725E-01	1.4726E-01	7.259E-02
TL-208		2.8908E-01	2.8908E-01	1.0567E-01	1.0692E-01	
PB-212	#	6.1177E-01	6.1177E-01	1.6588E-01	1.6945E-01	1.457E-01
PB-214		8.2950E-01	8.2950E-01	1.9301E-01	1.9862E-01	
BI-212	#A	5.0542E-01	5.0542E-01	5.5649E-01	5.5722E-01	5.644E-01
BI-214		8.6282E-01	8.6282E-01	2.4091E-01	2.4579E-01	
RA-224	#A	1.3163E+00	1.3163E+00	1.5641E+00	1.5659E+00	1.682E+00
RA-226	#	1.6084E+00	1.6084E+00	1.4494E+00	1.4523E+00	1.525E+00
AC-228		8.4402E-01	8.4402E-01	3.1345E-01	3.1706E-01	
TH-227	#B	-2.6766E-03	-2.6766E-03	4.3006E-01	4.3006E-01	4.932E-01
PA-234	#B	-4.1719E-02	-4.1719E-02	2.1107E-01	2.1108E-01	2.364E-01
TH-234	#B	2.0606E+00	2.0606E+00	1.3898E+00	1.3945E+00	2.905E+00
AM-241	#A	-1.0529E-02	-1.0530E-02	4.7706E-01	4.7706E-01	4.330E-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

Yankee Chemistry Spectrum name: 101F_21DEC2004_1630.An1

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

Total Activity (295.1 to 1999.1 keV) 1.6140612E+01 pCi/gm
Total Decayed Activity (295.1 to 1999.1 keV) 1.6140612E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_21DEC2004_1710.An1

Sample description
Detector 101 FSS OOL-04-01-014-F

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_21DEC2004_1710.An1

Acquisition information
Start time: 21-Dec-2004 17:02:02
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: 1.3340E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.3340E+03) = 7.4963E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_21DEC2004_1710.An1

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	06-Dec-2004 11:31:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1443

***** 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	184.	15.81	1.00	1.656E-02	74.81	9.600	1.172E+00	PB212
77.33	314.	9.32	1.01	1.737E-02	77.11	17.500	1.056E+00	PB212
					77.11	10.700	1.726E+00	PB214
92.98	101.	36.30	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.713E+00	TH234
186.14	107.	20.79	0.78	1.857E-02	185.99	3.280	1.778E+00	RA226
209.12	61.	34.92	0.96	1.723E-02				
238.68	603.	4.72	1.12	1.557E-02	238.63	43.100	9.097E-01	PB212
241.55	125.	16.52	1.12	1.542E-02	241.00	3.900	2.107E+00	RA224
					241.92	7.470	1.104E+00	PB214
270.40	65.	33.40	0.96	1.400E-02				
295.34	188.	9.51	1.16	1.292E-02	295.22	19.200	7.665E-01	PB214
300.00	32.	40.62	1.16	1.273E-02				
328.06	32.	41.22	1.41	1.169E-02				
338.28	117.	17.27	1.13	1.135E-02	338.40	12.010	8.695E-01	AC228
352.12	268.	8.32	1.13	1.092E-02	351.99	37.100	6.693E-01	PB214
462.73	45.	23.20	1.24	8.355E-03				
462.73	45.	23.20	1.24	8.355E-03	463.51	10.000	5.522E-01	SB125
510.98	111.	18.28	1.06	7.587E-03	510.72	22.500	6.572E-01	TL208
582.93	208.	9.77	1.19	6.687E-03	583.14	86.000	3.664E-01	TL208
609.26	181.	10.14	1.39	6.413E-03	609.32	46.090	6.210E-01	BI214
					614.37	90.393	3.192E-01	Ag108M
661.41	30.	36.19	1.50	5.937E-03	661.62	84.620	PBC<MDA	CS137
726.96	51.	25.17	1.31	5.444E-03	727.17	11.800	8.012E-01	BI212
911.07	117.	11.74	1.26	4.447E-03	911.07	29.000	9.184E-01	AC228
969.06	90.	18.26	1.38	4.212E-03	968.90	17.460	1.234E+00	AC228

1121.76	101.	14.85	1.82	3.711E-03	1120.28	15.040	1.835E+00	BI214
1460.49	442.	4.90	1.75	2.943E-03	1460.75	10.700	1.421E+01	K40
1764.17	33.	17.41	1.67	2.481E-03	1764.51	15.920	8.462E-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	
148.49	74.88	330.	184.	0.092	47.44	1.005	PB-214	D
154.22	77.74	271.	314.	0.157	27.97	1.007	PB-214	D
417.92	209.12	187.	61.	0.031	104.76	0.959	AC-228	
477.07	238.65	103.	603.	0.301	14.16	1.122	PB-212	D
540.52	270.40	155.	65.	0.032	100.19	0.964	AC-228	
599.76	299.97	69.	32.	0.016	121.87	1.165	TH-227	lD
655.89	328.06	71.	32.	0.016	123.66	1.412	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	149.13	74.78	836.	180.	0.090	71.80	1.499
PB-212	153.79	77.11	769.	242.	0.121	52.21	1.499D
PB-214	153.79	77.11	769.	242.	0.121	52.21	1.499D
TH-234	185.55	92.98	620.	101.	0.050	108.89	1.499
RA-226	371.80	186.07	327.	104.	0.052	79.64	1.499
PB-212	477.07	238.69	309.	427.	0.213	22.72	1.499
RA-224	481.70	241.00	319.	100.	0.050	81.58	1.123D
PB-214	590.29	295.27	139.	156.	0.078	40.00	1.499
AC-228	676.35	338.28	112.	117.	0.058	51.81	1.130
PB-214	703.74	351.97	104.	253.	0.126	25.47	1.499
SB-125	925.60	462.85	31.	50.	0.025	63.49	1.499
TL-208	1021.91	510.98	83.	111.	0.055	54.85	1.062s
TL-208	1165.87	582.93	62.	208.	0.104	29.32	1.186
BI-214	1218.56	609.26	56.	181.	0.091	30.41	1.386
CS-137	1322.90	661.41	44.	30.	0.015	108.57	1.499
BI-212	1454.07	726.96	35.	51.	0.025	75.50	1.311
AC-228	1822.48	911.07	23.	117.	0.058	35.23	1.264
AC-228	1938.52	969.06	43.	90.	0.045	54.77	1.384
BI-214	2244.11	1121.76	32.	101.	0.051	44.56	1.816s
K-40	2921.99	1460.49	8.	442.	0.221	14.70	1.746
BI-214	3529.77	1764.17	0.	33.	0.016	52.22	1.666

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		1.0021E-01					
			477.56	1.002E-01	%(	5.147E-01 1.49E-01	G
K-40		1.4205E+01					
			1460.75	1.421E+01	(	4.978E-01 6.96E-01	G
MN-54		-1.9852E-03					
			834.81	-1.985E-03	%(	6.214E-02 1.72E-02	G
CO-57		-1.0453E-02					
			122.07	-1.045E-02	%(P	5.762E-02 1.71E-02	G K
			136.43	-1.571E-01	%	5.219E-01 1.57E-01	G
CO-60		2.0975E-02					
			1332.51	2.097E-02	%(P	8.078E-02 2.19E-02	G K
			1173.23	-3.611E-02	% P	9.651E-02 2.57E-02	G K
Sr-85		-2.2937E-02					
			514.00	-2.294E-02	%(	8.816E-02 2.62E-02	G
Kr-85		-4.4968E+02					
			513.99	-4.497E+02	%(	1.730E+03 5.13E+02	G
Y-88		-1.0949E-02					
			1836.01	-1.095E-02	%(P	7.930E-02 2.10E-02	G K
			898.02	-6.503E-03	% P	8.677E-02 2.42E-02	G
NB-94		1.4173E-02					
			871.10	1.417E-02	%(	5.906E-02 1.71E-02	G K
			702.50	-8.192E-03	%	5.568E-02 1.59E-02	G K
Ag-108M		2.1780E-03					
			722.95	2.178E-03	%(	1.189E-01 3.45E-02	G K
			614.37	-2.655E-03	%	5.939E-02 1.67E-02	G
			433.93	1.736E-03	%	5.649E-02 1.62E-02	G
CD-109		-2.8886E-02					
			88.04	-2.889E-02	%(	1.858E+00 5.53E-01	G
SN-113		1.3084E-02					
			391.71	1.308E-02	&(P	8.614E-02 2.51E-02	G K
			255.04	8.152E-01	%	2.250E+00 6.75E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.2802E-01						
		427.95	-3.534E-02	%(	1.643E-01	4.81E-02	G K
		600.77	-2.545E-02	%	2.880E-01	8.17E-02	G
		636.15	9.872E-02	&	4.502E-01	1.30E-01	G
		463.51	6.116E-01	(	3.502E-01	1.29E-01	G
		176.29	1.407E-01	&	7.809E-01	2.33E-01	G
I-131	3.2867E-02						
		364.48	3.287E-02	%(	2.041E-01	5.95E-02	G K
		636.97	1.286E-01	%	2.992E+00	8.45E-01	G
		284.29	5.162E-02	%	3.140E+00	9.16E-01	G
CS-134	-3.4692E-03						
		604.66	-3.469E-03	&(	1.533E-01	4.52E-02	G K
		795.76	1.781E-02	%	7.405E-02	2.15E-02	G
		569.29	3.874E-02	%	3.668E-01	1.05E-01	G
		801.84	-1.028E-01	%	7.981E-01	2.28E-01	G
CS-137	6.0498E-02						
		661.62	6.050E-02	(	6.775E-02	2.19E-02	G
CE-139	-6.3315E-04						
		165.85	-6.331E-04	&(P	6.188E-02	1.82E-02	G
EU-152	-2.4460E-02						
		121.78	-2.446E-02	%(	1.719E-01	5.12E-02	G K
		344.30	-2.838E-02	%	1.967E-01	5.78E-02	G
		1408.08	3.209E-02	%	3.073E-01	8.34E-02	G
		964.00	2.814E-01	%	5.166E-01	1.59E-01	G
		1112.07	6.358E-02	%	4.959E-01	1.39E-01	G
		778.90	4.341E-02	&	4.045E-01	1.13E-01	G
EU-154	0.0000E+00						
		123.10	0.000E+00	%(	1.211E-01	3.58E-02	G K
		1274.80	-3.933E-02	%	2.642E-01	7.54E-02	G
		723.30	4.724E-05	%	2.963E-01	8.22E-02	G
		1004.80	3.937E-02	&	3.822E-01	1.07E-01	G
EU-155	1.1232E-02						
		86.45	1.123E-02	&(	1.452E-01	4.29E-02	G K
		105.31	2.992E-02	%	2.403E-01	7.15E-02	G
HG-203	-5.8317E-03						
		279.17	-5.832E-03	&(P	6.655E-02	1.89E-02	G K
		72.87	-7.260E-01	%	1.972E+00	5.96E-01	G
		70.83	-4.935E-01	%	2.470E+00	7.38E-01	G
		82.50	-8.865E-01	%	3.962E+00	1.19E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.6635E-01						
		583.14	3.664E-01	(	6.949E-02	3.58E-02	G
		510.72	6.572E-01	+	2.682E-01	1.20E-01	G
PB-212	6.4418E-01						
		238.63	6.442E-01	(	1.277E-01	4.88E-02	G K
							Energy duplication
		77.11	8.157E-01	+	4.439E-01	1.42E-01	G
		74.81	1.147E+00	&	8.769E-01	2.75E-01	G
PB-214	6.3338E-01						
		351.99	6.312E-01	(	1.253E-01	5.36E-02	G K
		295.22	6.375E-01	(	2.351E-01	8.50E-02	G
							Energy duplication
		77.11	1.334E+00	+	7.260E-01	2.32E-01	G
		241.92	-1.939E-02	%	9.240E-01	2.73E-01	G
BI-212	8.0124E-01						
		727.17	8.012E-01	(	4.788E-01	2.02E-01	G K
		1620.56	1.144E+00	%	1.948E+00	6.21E-01	G
		785.42	-1.775E-01	%	3.052E+00	8.55E-01	G
BI-214	6.2105E-01						
		609.32	6.210E-01	(	1.286E-01	6.30E-02	G K
		1764.51	8.462E-01	+	1.890E-01	1.47E-01	G
		1120.28	1.835E+00	+	5.269E-01	2.73E-01	G
RA-224	1.6797E+00						
		241.00	1.680E+00	(	1.445E+00	4.57E-01	G
RA-226	1.7235E+00						
		185.99	1.724E+00	(	1.446E+00	4.58E-01	G
AC-228	1.0026E+00						
		911.07	9.184E-01	(	1.972E-01	1.08E-01	G K
		968.90	1.234E+00	(	4.602E-01	2.25E-01	G
		338.40	8.695E-01	(	3.866E-01	1.50E-01	G
TH-227	-1.0214E-01						
		236.00	-1.021E-01	%(	5.451E-01	1.63E-01	G K
		256.25	-1.081E-02	&	6.496E-01	1.89E-01	G
PA-234	3.2525E-02						
		98.44	3.252E-02	%(	2.203E-01	6.57E-02	G K
		946.00	-6.038E-02	&	3.531E-01	1.01E-01	G
		131.28	6.149E-03	&	2.678E-01	7.94E-02	G
		94.67	-1.242E-01	%	4.106E-01	1.24E-01	G
		883.24	1.141E-01	%	4.072E-01	1.18E-01	G
		926.70	-1.356E-01	%	7.159E-01	2.07E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		569.26	5.645E-02	%	5.366E-01	1.54E-01	G
TH-234	1.2679E+00						
		63.29	9.259E-01	%(	2.681E+00	8.08E-01	G K
		92.80	1.713E+00	(	2.016E+00	6.22E-01	G
		92.38	-4.228E-02	&	2.414E+00	7.17E-01	G
AM-241	2.5155E-02						
		59.54	2.516E-02	%(P	3.682E-01	1.09E-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	8.2232E-02	1.0021E-01	4.4727E-01	4.4731E-01	4.224E-01
K-40		1.4205E+01	1.4205E+01	2.0876E+00	2.2366E+00	
MN-54	#A	-1.9192E-03	-1.9852E-03	5.1575E-02	5.1575E-02	6.008E-02
CO-57	#B	-1.0052E-02	-1.0453E-02	5.9603E-02	5.9606E-02	5.541E-02
CO-60	#B	2.0860E-02	2.0975E-02	6.5731E-02	6.5742E-02	8.034E-02

Sr-85	#A	-1.9491E-02	-2.2937E-02	7.8459E-02	7.8469E-02	7.491E-02
Kr-85	#A	-4.4963E+02	-4.4968E+02	1.5392E+03	1.5394E+03	1.729E+03
Y-88	#B	-9.9170E-03	-1.0949E-02	7.8117E-02	7.8120E-02	7.182E-02
NB-94	#B	1.4173E-02	1.4173E-02	5.1177E-02	5.1183E-02	5.906E-02
Ag-108M	#B	2.1775E-03	2.1780E-03	1.0335E-01	1.0335E-01	1.188E-01
CD-109	#A	-2.8221E-02	-2.8886E-02	1.6581E+00	1.6581E+00	1.816E+00
SN-113	#B	1.1937E-02	1.3084E-02	7.5246E-02	7.5250E-02	7.859E-02
SB-125	#B	1.2669E-01	1.2802E-01	8.1286E-02	8.1608E-02	1.626E-01
I-131	#B	8.8417E-03	3.2867E-02	1.7863E-01	1.7864E-01	5.490E-02
CS-134	#B	-3.4209E-03	-3.4692E-03	1.3571E-01	1.3571E-01	1.511E-01
CS-137	#A	6.0440E-02	6.0498E-02	6.5685E-02	6.5774E-02	6.769E-02
CE-139	#A	-5.8636E-04	-6.3315E-04	7.4445E-02	7.4445E-02	5.731E-02
EU-152	#B	-2.4405E-02	-2.4460E-02	1.5366E-01	1.5367E-01	1.715E-01
EU-154	#B	0.0000E+00	0.0000E+00	1.0730E-01	1.0730E-01	1.207E-01
EU-155	#B	1.1167E-02	1.1232E-02	1.2884E-01	1.2884E-01	1.444E-01
HG-203	#B	-4.6493E-03	-5.8317E-03	4.5128E+01	4.5128E+01	5.306E-02
TL-208		3.6635E-01	3.6635E-01	1.0741E-01	1.0939E-01	
PB-212	#	6.4418E-01	6.4418E-01	1.4635E-01	1.5081E-01	1.277E-01
PB-214	#	6.3338E-01	6.3338E-01	1.5017E-01	1.5437E-01	1.253E-01
BI-212		8.0124E-01	8.0124E-01	6.0492E-01	6.0661E-01	
BI-214		6.2105E-01	6.2105E-01	1.8888E-01	1.9211E-01	
RA-224		1.6797E+00	1.6797E+00	1.3703E+00	1.3736E+00	
RA-226	#	1.7235E+00	1.7235E+00	1.3727E+00	1.3761E+00	1.446E+00
AC-228		1.0026E+00	1.0026E+00	2.7811E-01	2.8382E-01	
TH-227	#B	-1.0214E-01	-1.0214E-01	4.8756E-01	4.8760E-01	5.451E-01
PA-234	#B	3.2525E-02	3.2525E-02	1.9712E-01	1.9713E-01	2.203E-01
TH-234	#B	1.2679E+00	1.2679E+00	1.3806E+00	1.3824E+00	2.681E+00
AM-241	#A	2.5154E-02	2.5155E-02	3.2822E-01	3.2822E-01	3.681E-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) 1.8676235E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.8676235E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_21DEC2004_1745.An1

Sample description
Detector 101 FSS OOL-04-01-023-FB

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_21DEC2004_1745.An1

Acquisition information

Start time:	21-Dec-2004 17:38:15
Live time:	2000
Real time:	2002
Dead time:	0.12 %
Detector ID:	1

Detector system
Det 101- DSPE-633

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

Energy Calibration

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

Efficiency Calibration

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

Library Files

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

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.3840E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.3840E+03) = 7.2254E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_21DEC2004_1745.An1

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	06-Dec-2004 13:21:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1049

***** 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
74.66	214.	14.62	1.00	1.651E-02				
74.66	214.	14.62	1.00	1.651E-02	74.81	9.600	1.317E+00	PB212
74.78	211.	21.17	1.50	1.654E-02				
74.78	211.	21.17	1.50	1.654E-02	74.81	9.600	1.299E+00	PB212
76.95	230.	19.11	1.50	1.720E-02	77.11	10.700	1.221E+00	PB214
					77.11	17.500	7.467E-01	PB212
77.05	302.	10.44	1.01	1.720E-02	77.11	10.700	1.600E+00	PB214
					77.11	17.500	9.782E-01	PB212
87.13	157.	26.38	1.50	1.910E-02	86.45	32.740	2.465E-01	EU155
					88.04	3.790	2.141E+00	CD109
93.01	111.	36.21	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.812E+00	TH234
93.07	110.	36.93	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.799E+00	TH234
127.84	85.	41.18	0.87	2.111E-02				
185.96	84.	27.20	1.49	1.858E-02				
185.96	84.	27.20	1.49	1.858E-02	185.99	3.280	1.346E+00	RA226
208.99	86.	36.88	1.07	1.723E-02				
238.70	701.	4.42	1.12	1.557E-02	238.63	43.100	1.019E+00	PB212
241.95	97.	19.33	1.12	1.540E-02	241.92	7.470	8.208E-01	PB214
269.53	70.	36.45	1.16	1.404E-02				
295.28	136.	13.13	1.16	1.292E-02	295.22	19.200	5.334E-01	PB214
328.16	36.	36.33	1.49	1.169E-02				
338.51	174.	13.43	1.23	1.135E-02	338.40	12.010	1.246E+00	AC228
351.93	295.	9.37	1.19	1.093E-02	351.99	37.100	7.102E-01	PB214
463.24	36.	37.79	0.93	8.346E-03				

463.24	36.	37.79	0.93	8.346E-03	463.51	10.000	4.317E-01	SB125
510.60	93.	22.77	1.67	7.592E-03	510.72	22.500	5.340E-01	TL208
582.98	230.	9.61	1.37	6.686E-03	583.14	86.000	3.903E-01	TL208
609.29	214.	8.54	1.35	6.413E-03	609.32	46.090	7.063E-01	BI214
727.52	50.	29.67	0.70	5.443E-03	727.17	11.800	7.616E-01	BI212
794.63	35.	34.56	1.34	5.022E-03				
794.63	35.	34.56	1.34	5.022E-03	795.76	85.400	8.205E-02	CS134
911.03	109.	13.98	1.44	4.447E-03	911.07	29.000	8.261E-01	AC228

Yankee Chemistry Spectrum name: 101F_21DEC2004_1745.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
968.60	92.	17.86	1.73	4.213E-03	968.90	17.460	1.227E+00	AC228
1119.85	44.	27.35	1.00	3.711E-03	1120.28	15.040	7.698E-01	BI214
1460.54	581.	4.15	1.86	2.943E-03	1460.75	10.700	1.802E+01	K40
1763.71	51.	14.00	2.50	2.481E-03	1764.51	15.920	1.261E+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	
148.88	74.72	383.	214.	0.107	43.85	1.005	BI-207	D
255.29	127.84	422.	119.	0.060	77.98	0.873	AC-228	s
417.66	208.99	338.	86.	0.043	110.65	1.067	AC-228	
477.10	238.66	128.	701.	0.350	13.25	1.122	PB-212	D
538.78	269.53	209.	70.	0.035	109.36	1.158	AC-228	s
656.09	328.16	70.	36.	0.018	109.00	1.492	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	149.13	74.78	894.	211.	0.106	63.50	1.499s
PB-214	153.79	77.11	345.	302.	0.151	31.33	1.006D
PB-212	153.79	77.11	853.	230.	0.115	57.34	1.499D
EU-155	173.84	87.13	778.	157.	0.078	79.14	1.499
TH-234	185.72	93.07	770.	110.	0.055	110.80	1.499s
TH-234	185.59	93.01	748.	111.	0.055	108.62	1.499s
RA-226	371.85	186.10	356.	94.	0.047	90.42	1.499s
PB-212	476.91	238.61	331.	521.	0.261	19.80	1.499
PB-214	483.54	241.92	126.	97.	0.048	58.08	1.124D
PB-214	590.42	295.34	203.	148.	0.074	54.43	1.537s
AC-228	676.71	338.46	140.	174.	0.087	43.58	1.229s
PB-214	703.66	351.93	151.	295.	0.147	28.12	1.191
SB-125	926.25	463.18	67.	37.	0.018	106.28	1.499
TL-208	1021.14	510.60	106.	93.	0.047	68.32	1.673s
TL-208	1165.96	582.98	78.	230.	0.115	28.83	1.369s
BI-214	1218.61	609.29	44.	214.	0.107	25.61	1.349
BI-212	1455.19	727.52	59.	50.	0.025	89.00	0.698s
AC-228	1822.42	911.03	40.	109.	0.055	41.95	1.442
AC-228	1937.61	968.60	49.	92.	0.046	53.57	1.728

Yankee Chemistry Spectrum name: 101F_21DEC2004_1745.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	2240.30	1119.85	36.	44.	0.022	82.05	0.999s
K-40	2922.09	1460.54	0.	581.	0.290	12.45	1.860
BI-214	3528.85	1763.71	0.	51.	0.025	42.01	2.498s

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		1.3358E-01					
			477.56	1.336E-01	%(	5.041E-01 1.48E-01 G	
K-40		1.8018E+01					
			1460.75	1.802E+01	(	2.286E-01 7.47E-01 G	
MN-54		8.6511E-03					
			834.81	8.651E-03	%(	7.325E-02 2.09E-02 G	
CO-57		-1.2355E-03					
			122.07	-1.236E-03	%(P	6.173E-02 1.83E-02 G K	
			136.43	-4.728E-02	&	5.080E-01 1.51E-01 G	
CO-60		2.6446E-02					
			1332.51	2.645E-02	%(P	7.548E-02 2.09E-02 G K	
			1173.23	1.391E-04	% P	9.052E-02 2.41E-02 G K	
Sr-85		-2.8170E-02					
			514.00	-2.817E-02	%(	9.029E-02 2.70E-02 G	
Kr-85		-5.5296E+02					
			513.99	-5.530E+02	%(	1.772E+03 5.29E+02 G	
Y-88		-1.1187E-03					
			1836.01	-1.119E-03	%(P	3.343E-02 4.54E-03 G K	
			898.02	-3.674E-03	% P	6.615E-02 1.78E-02 G	
NB-94		6.5264E-03					
			871.10	6.526E-03	%(	4.660E-02 1.30E-02 G K	
			702.50	6.495E-03	&	5.595E-02 1.59E-02 G K	
Ag-108M		2.0993E-03					
			722.95	2.099E-03	&(	1.317E-01 3.84E-02 G K	
			614.37	-2.032E-03	&	6.286E-02 1.78E-02 G	
			433.93	-1.300E-03	%	5.977E-02 1.72E-02 G	

Yankee Chemistry Spectrum name: 101F_21DEC2004_1745.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	-3.9288E-02						
		88.04	-3.929E-02	%(	1.799E+00	5.35E-01	G
SN-113	-2.0052E-02						
		391.71	-2.005E-02	%(P	9.302E-02	2.73E-02	G K
		255.04	0.000E+00	&	2.669E+00	7.81E-01	G
SB-125	1.2344E-01						
		427.95	1.736E-02	%(	1.602E-01	4.63E-02	G K
		600.77	5.191E-02	&	2.730E-01	7.88E-02	G
		636.15	-6.775E-02	%	5.397E-01	1.55E-01	G
		463.51	4.374E-01	(	4.844E-01	1.55E-01	G
		176.29	-7.206E-03	&	7.971E-01	2.35E-01	G
I-131	-3.6415E-02						
		364.48	-3.641E-02	%(	1.958E-01	5.73E-02	G K
		636.97	-4.989E-01	%	3.087E+00	8.93E-01	G
		284.29	1.323E-01	%	2.275E+00	6.58E-01	G
CS-134	-3.0916E-02						
		604.66	-3.092E-02	%(	7.492E-02	2.25E-02	G K
		795.76	0.000E+00	%	8.862E-02	2.50E-02	G
		569.29	3.223E-02	%	3.364E-01	9.60E-02	G
		801.84	6.333E-02	%	8.202E-01	2.33E-01	G
CS-137	-2.5939E-04						
		661.62	-2.594E-04	%(	8.091E-02	2.30E-02	G
CE-139	2.5782E-04						
		165.85	2.578E-04	%(P	6.608E-02	1.95E-02	G
EU-152	-2.8445E-02						
		121.78	-2.844E-02	%(	1.754E-01	5.24E-02	G K
		344.30	-4.511E-02	%	1.706E-01	5.06E-02	G
		1408.08	1.373E-01	%	3.180E-01	9.56E-02	G
		964.00	-6.901E-03	&	7.163E-01	2.05E-01	G
		1112.07	1.516E-01	%	5.585E-01	1.63E-01	G
		778.90	4.956E-02	%	4.607E-01	1.31E-01	G
EU-154	9.9597E-03						
		123.10	9.960E-03	%(	1.272E-01	3.78E-02	G K
		1274.80	0.000E+00	%	2.059E-01	5.56E-02	G
		723.30	2.680E-02	&	3.022E-01	8.57E-02	G
		1004.80	-4.286E-02	%	4.232E-01	1.20E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	2.4652E-01						
		86.45	2.465E-01	(	2.085E-01	6.50E-02	G K
		105.31	5.046E-02	%	2.372E-01	7.10E-02	G
HG-203	-1.4562E-02						
		279.17	-1.456E-02	%(P	7.535E-02	2.19E-02	G K
		72.87	1.323E-01	%	1.675E+00	5.00E-01	G
		70.83	-2.181E+00	&	3.307E+00	1.01E+00	G
		82.50	-7.302E-01	%	4.123E+00	1.24E+00	G
TL-208	3.9032E-01						
		583.14	3.903E-01	@(	7.460E-02	3.75E-02	G
		510.72	5.340E-01	+	2.893E-01	1.22E-01	G
PB-212	7.5511E-01						
		238.63	7.585E-01	(	1.273E-01	5.01E-02	G K
							Energy duplication
		77.11	7.467E-01	@(	4.502E-01	1.43E-01	G
		74.81	1.299E+00	&	8.736E-01	2.75E-01	G
PB-214	7.2852E-01						
		351.99	7.102E-01	(	1.446E-01	6.66E-02	G K
		295.22	5.810E-01	-	2.723E-01	1.05E-01	G
							Energy duplication
		77.11	1.600E+00	+	4.737E-01	1.67E-01	G
		241.92	8.195E-01	(	4.677E-01	1.59E-01	G
BI-212	7.6165E-01						
		727.17	7.616E-01	(	5.849E-01	2.26E-01	G K
		1620.56	0.000E+00	%	3.382E+00	9.18E-01	G
		785.42	1.502E+00	%	2.577E+00	7.99E-01	G
BI-214	7.2192E-01						
		609.32	7.063E-01	(	1.113E-01	6.03E-02	G K
		1764.51	1.261E+00	+	1.822E-01	1.76E-01	G
		1120.28	7.698E-01	(	5.366E-01	2.10E-01	G
RA-224	-6.8207E-02						
		241.00	-6.821E-02	%(	1.365E+00	4.02E-01	G
RA-226	1.5092E+00						
		185.99	1.509E+00	(	1.452E+00	4.55E-01	G
AC-228	8.2611E-01						
		911.07	8.261E-01	(	2.434E-01	1.16E-01	G K
		968.90	1.227E+00	+	4.673E-01	2.19E-01	G
		338.40	1.244E+00	+	4.148E-01	1.81E-01	G

Yankee Chemistry Spectrum name: 101F_21DEC2004_1745.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-1.8248E-01						
		236.00	-1.825E-01	%(	5.958E-01	1.79E-01	G K
		256.25	4.424E-02	&	7.399E-01	2.18E-01	G
PA-234	-4.6712E-02						
		98.44	-4.671E-02	&(	2.226E-01	6.67E-02	G K
		946.00	6.739E-02	%	3.206E-01	9.22E-02	G
		131.28	-9.389E-02	%	2.772E-01	8.35E-02	G
		94.67	-1.918E-02	&	4.106E-01	1.22E-01	G
		883.24	8.470E-02	%	4.669E-01	1.33E-01	G
		926.70	0.000E+00	&	6.595E-01	1.83E-01	G
		569.26	4.643E-02	%	4.923E-01	1.40E-01	G
TH-234	1.5903E+00						
		63.29	1.081E+00	%(	2.709E+00	8.19E-01	G K
		92.80	1.812E+00	(	2.130E+00	6.56E-01	G
		92.38	2.105E+00	(	2.527E+00	7.77E-01	G
AM-241	-2.6868E-02						
		59.54	-2.687E-02	&(P	3.777E-01	1.12E-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

Yankee Chemistry Spectrum name: 101F_21DEC2004_1745.An1

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	1.0969E-01	1.3358E-01	4.4355E-01	4.4362E-01	4.140E-01
K-40		1.8018E+01	1.8018E+01	2.2426E+00	2.4629E+00	
MN-54	#A	8.3644E-03	8.6511E-03	6.2821E-02	6.2823E-02	7.082E-02
CO-57	#B	-1.1883E-03	-1.2355E-03	2.1846E-01	2.1846E-01	5.937E-02
CO-60	#B	2.6302E-02	2.6446E-02	6.2582E-02	6.2599E-02	7.506E-02
Sr-85	#A	-2.3950E-02	-2.8170E-02	8.0864E-02	8.0880E-02	7.677E-02
Kr-85	#A	-5.5290E+02	-5.5296E+02	1.5874E+03	1.5877E+03	1.772E+03
Y-88	#B	-1.0136E-03	-1.1187E-03	6.7124E-03	6.7127E-03	3.028E-02
NB-94	#B	6.5264E-03	6.5264E-03	3.8851E-02	3.8853E-02	4.660E-02
Ag-108M	#B	2.0988E-03	2.0993E-03	1.1523E-01	1.1523E-01	1.317E-01
CD-109	#A	-3.8387E-02	-3.9288E-02	1.6059E+00	1.6059E+00	1.758E+00
SN-113	#B	-1.8301E-02	-2.0052E-02	1.0028E-01	1.0029E-01	8.489E-02
SB-125	#B	1.2216E-01	1.2344E-01	1.3119E-01	1.3138E-01	1.585E-01
I-131	#B	-9.8393E-03	-3.6415E-02	1.7196E-01	1.7197E-01	5.291E-02
CS-134	#B	-3.0487E-02	-3.0916E-02	6.7649E-02	6.7671E-02	7.388E-02
CS-137	#A	-2.5914E-04	-2.5939E-04	6.8899E-02	6.8899E-02	8.083E-02
CE-139	#A	2.3882E-04	2.5782E-04	5.8523E-02	5.8523E-02	6.121E-02
EU-152	#B	-2.8380E-02	-2.8445E-02	1.5707E-01	1.5707E-01	1.750E-01
EU-154	#B	9.9260E-03	9.9597E-03	1.1348E-01	1.1348E-01	1.268E-01
EU-155	#	2.4510E-01	2.4652E-01	1.9510E-01	1.9558E-01	2.073E-01
HG-203	#B	-1.1619E-02	-1.4562E-02	1.4855E-01	1.4855E-01	6.012E-02
TL-208	#	3.9032E-01	3.9032E-01	1.1255E-01	1.1469E-01	
PB-212	#	7.5511E-01	7.5511E-01	1.4948E-01	1.5545E-01	1.273E-01
PB-214		7.2852E-01	7.2852E-01	2.0485E-01	2.0895E-01	
BI-212		7.6165E-01	7.6165E-01	6.7787E-01	6.7923E-01	
BI-214		7.2192E-01	7.2192E-01	1.8489E-01	1.8934E-01	
RA-224	#A	-6.8207E-02	-6.8207E-02	1.2071E+00	1.2071E+00	1.365E+00
RA-226	#	1.5092E+00	1.5092E+00	1.3646E+00	1.3673E+00	1.452E+00
AC-228		8.2611E-01	8.2611E-01	3.4659E-01	3.4972E-01	
TH-227	#B	-1.8248E-01	-1.8248E-01	5.3728E-01	5.3738E-01	5.958E-01
PA-234	#B	-4.6712E-02	-4.6712E-02	1.9997E-01	1.9998E-01	2.226E-01
TH-234	#B	1.5903E+00	1.5903E+00	1.4584E+00	1.4610E+00	2.709E+00
AM-241	#A	-2.6867E-02	-2.6868E-02	3.5820E-01	3.5820E-01	3.776E-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

Yankee Chemistry Spectrum name: 101F_21DEC2004_1745.An1

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

Total Activity (269.1 to 1999.1 keV) 2.1446821E+01 pCi/gm
Total Decayed Activity (269.1 to 1999.1 keV) 2.1446821E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_21DEC2004_1820.An1

Sample description
Detector 101 FSS OOL-04-01-006-F

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_21DEC2004_1820.An1

Acquisition information
Start time: 21-Dec-2004 18:14:31
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: 1.5410E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5410E+03) =
6.4893E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_21DEC2004_1820.An1

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	03-Dec-2004 07:40:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1319

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
62.72	89.	37.64	0.67	1.082E-02				
62.72	89.	37.64	0.67	1.082E-02	63.29	3.900	1.784E+00	TH234
74.79	180.	16.03	1.00	1.653E-02				
74.79	180.	16.03	1.00	1.653E-02	74.81	9.600	9.914E-01	PB212
77.75	180.	17.95	1.01	1.737E-02	77.11	17.500	5.243E-01	PB212
					77.11	10.700	8.575E-01	PB214
84.62	57.	41.59	1.18	1.880E-02				
87.33	113.	23.55	1.01	1.925E-02	86.45	32.740	1.597E-01	EU155
					88.04	3.790	1.393E+00	CD109
89.55	82.	33.16	1.02	1.954E-02				
92.91	115.	22.33	1.02	1.992E-02	92.38	2.570	1.971E+00	TH234
					92.80	3.000	1.685E+00	TH234
129.00	93.	33.95	1.49	2.110E-02				
186.01	60.	36.10	1.30	1.858E-02	185.99	3.280	8.561E-01	RA226
208.49	65.	40.95	0.78	1.726E-02				
238.67	541.	5.14	1.12	1.558E-02				
238.67	541.	5.14	1.12	1.558E-02	238.63	43.100	7.072E-01	PB212
241.08	90.	30.68	1.12	1.545E-02	241.00	3.900	1.305E+00	RA224
					241.92	7.470	6.834E-01	PB214
242.40	101.	21.12	1.12	1.538E-02	241.92	7.470	7.684E-01	PB214
269.69	77.	31.18	0.78	1.403E-02				
295.24	181.	10.02	1.16	1.292E-02				
295.24	181.	10.02	1.16	1.292E-02	295.22	19.200	6.399E-01	PB214
299.90	50.	28.72	1.16	1.274E-02				
338.28	115.	16.37	1.00	1.135E-02	338.40	12.010	7.398E-01	AC228
351.87	338.	7.83	1.08	1.093E-02				

351.87	338.	7.83	1.08	1.093E-02	351.99	37.100	7.322E-01	PB214
462.95	32.	35.94	1.50	8.342E-03	463.51	10.000	PBC<MDA	SB125
510.77	116.	16.77	1.75	7.590E-03	510.72	22.500	5.956E-01	TL208
582.92	181.	10.20	1.39	6.687E-03	583.14	86.000	2.767E-01	TL208
609.33	229.	10.21	1.17	6.413E-03	609.32	46.090	6.789E-01	BI214
859.96	34.	32.99	1.47	4.680E-03				
911.09	125.	14.14	1.65	4.446E-03	911.07	29.000	8.501E-01	AC228
968.63	115.	15.82	1.17	4.213E-03	968.90	17.460	1.369E+00	AC228
1120.31	77.	16.78	1.73	3.711E-03	1120.28	15.040	1.210E+00	BI214
1460.53	630.	4.12	1.90	2.943E-03	1460.75	10.700	1.754E+01	K40
1763.99	55.	13.48	2.75	2.481E-03	1764.51	15.920	1.221E+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	
125.00	62.72	447.	89.	0.044	112.93	0.671	PA-234	l
149.15	74.79	324.	180.	0.090	48.10	1.005	BI-207	D
155.07	77.75	432.	180.	0.090	53.85	1.007	PB-214	D
174.24	87.50	298.	113.	0.057	70.64	1.014	PB-214	lD
178.68	89.72	331.	82.	0.041	99.49	1.015	PB-214	lD
257.62	129.00	381.	106.	0.053	83.06	1.487	AC-228	s
416.64	208.49	272.	65.	0.033	122.85	0.782	LU-177	s
477.06	238.60	117.	541.	0.271	15.43	1.122	PB-212	D
484.53	242.33	190.	87.	0.044	74.11	1.124	XE-138	D
539.10	269.69	176.	77.	0.038	93.55	0.782	AC-228	s
599.33	299.79	110.	50.	0.025	99.57	1.342	TH-227	s
1720.21	859.96	34.	34.	0.017	98.97	1.474	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	149.09	74.76	916.	155.	0.078	86.20	1.499
PB-212	153.79	77.11	822.	270.	0.135	48.63	1.499D
PB-214	153.79	77.11	822.	270.	0.135	48.63	1.499D
TH-234	185.60	93.01	698.	123.	0.061	95.18	1.499s
RA-226	371.61	185.98	382.	82.	0.041	106.91	1.499s
PB-212	476.95	238.62	290.	414.	0.207	22.84	1.499
RA-224	481.70	241.00	333.	90.	0.045	92.03	1.123D
PB-214	483.52	241.91	359.	133.	0.067	65.69	1.499s
PB-214	590.25	295.25	175.	166.	0.083	40.97	1.499
AC-228	676.35	338.28	104.	115.	0.058	49.10	1.001
PB-214	703.64	351.92	115.	301.	0.151	22.97	1.499
SB-125	925.79	462.95	49.	32.	0.016	107.83	1.499
TL-208	1021.49	510.77	75.	116.	0.058	50.31	1.746s
TL-208	1165.86	582.92	58.	181.	0.091	30.61	1.393
BI-214	1218.69	609.33	81.	229.	0.114	30.62	1.173
AC-228	1822.52	911.09	52.	125.	0.062	42.41	1.651s
AC-228	1937.67	968.63	51.	115.	0.057	47.46	1.172
BI-214	2241.22	1120.31	30.	77.	0.038	50.35	1.729s

Yankee Chemistry Spectrum name: 101F_21DEC2004_1820.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
K-40	2922.07	1460.53	10.	630.	0.315	12.37	1.902
BI-214	3529.41	1763.99	0.	55.	0.027	40.45	2.748s

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		-3.9340E-02					
			477.56	-3.934E-02	&(	5.489E-01 1.57E-01	G
K-40		1.7542E+01					
			1460.75	1.754E+01	(	4.900E-01 7.23E-01	G
MN-54		2.6897E-02					
			834.81	2.690E-02	%(	5.421E-02 1.65E-02	G
CO-57		-2.0661E-02					
			122.07	-2.066E-02	&(P	5.391E-02 1.62E-02	G K
			136.43	-4.558E-02	%	4.654E-01 1.39E-01	G
CO-60		-1.3090E-02					
			1332.51	-1.309E-02	%(P	6.873E-02 1.61E-02	G K
			1173.23	-8.724E-03	& P	7.239E-02 1.83E-02	G K
Sr-85		-2.8862E-02					
			514.00	-2.886E-02	&(	8.234E-02 2.47E-02	G
Kr-85		-5.4713E+02					
			513.99	-5.471E+02	&(	1.561E+03 4.68E+02	G
Y-88		-1.0263E-03					
			1836.01	-1.026E-03	&(P	3.066E-02 4.16E-03	G K
			898.02	-9.879E-03	% P	6.910E-02 1.93E-02	G
NB-94		1.8349E-03					
			871.10	1.835E-03	%(	6.183E-02 1.73E-02	G K
			702.50	-3.817E-04	%	4.998E-02 1.39E-02	G K
Ag-108M		-1.8855E-03					
			722.95	-1.886E-03	&(	1.078E-01 3.13E-02	G K
			614.37	-8.574E-03	%	6.238E-02 1.80E-02	G
			433.93	7.219E-03	%	4.984E-02 1.45E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	1.6479E-02						
		88.04	1.648E-02	%(	1.587E+00	4.72E-01	G
SN-113	-9.1988E-03						
		391.71	-9.199E-03	&(P	8.376E-02	2.43E-02	G K
		255.04	2.855E-01	%	1.784E+00	5.24E-01	G
SB-125	1.0317E-01						
		427.95	2.425E-02	%(	1.545E-01	4.51E-02	G K
		600.77	3.254E-02	&	2.480E-01	7.09E-02	G
		636.15	-9.429E-02	%	4.436E-01	1.29E-01	G
		463.51	3.368E-01	(	3.755E-01	1.21E-01	G
		176.29	1.242E-01	&	6.184E-01	1.84E-01	G
I-131	7.3584E-02						
		364.48	7.358E-02	%(	2.259E-01	6.72E-02	G K
		636.97	-5.119E-02	%	2.966E+00	8.24E-01	G
		284.29	4.934E-01	&	3.398E+00	1.00E+00	G
CS-134	3.1577E-03						
		604.66	3.158E-03	%(	3.969E-02	1.11E-02	G K
		795.76	3.818E-02	%	7.027E-02	2.15E-02	G
		569.29	-4.722E-03	&	2.120E-01	5.77E-02	G
		801.84	1.837E-02	%	6.441E-01	1.80E-01	G
CS-137	4.2726E-04						
		661.62	4.273E-04	&(	5.648E-02	1.57E-02	G
CE-139	1.5366E-02						
		165.85	1.537E-02	%(P	6.047E-02	1.81E-02	G
EU-152	-1.0968E-03						
		121.78	-1.097E-03	%(	1.593E-01	4.72E-02	G K
		344.30	2.865E-02	&	1.681E-01	4.95E-02	G
		1408.08	3.034E-02	%	2.605E-01	7.08E-02	G
		964.00	-7.539E-03	&	6.990E-01	2.01E-01	G
		1112.07	-5.646E-04	&	5.235E-01	1.45E-01	G
		778.90	-7.873E-03	&	3.771E-01	1.04E-01	G
EU-154	1.0954E-03						
		123.10	1.095E-03	&(	1.198E-01	3.55E-02	G K
		1274.80	-2.830E-02	%	2.373E-01	6.74E-02	G
		723.30	-8.871E-02	&	3.934E-01	1.16E-01	G
		1004.80	-5.863E-02	%	4.134E-01	1.18E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	7.5184E-03						
		86.45	7.518E-03	%(	1.966E-01	5.86E-02	G K
		105.31	2.836E-02	&	2.300E-01	6.86E-02	G
HG-203	-8.1174E-03						
		279.17	-8.117E-03	%(P	7.020E-02	2.02E-02	G K
		72.87	-5.196E-01	%	1.816E+00	5.47E-01	G
		70.83	3.574E-01	%	2.957E+00	8.84E-01	G
		82.50	-1.446E+00	%	3.776E+00	1.14E+00	G
TL-208	2.7672E-01						
		583.14	2.767E-01	(	5.808E-02	2.82E-02	G
		510.72	5.956E-01	+	2.211E-01	9.99E-02	G
PB-212	5.4101E-01						
		238.63	5.410E-01	(	1.072E-01	4.12E-02	G K
							Energy duplication
		77.11	7.863E-01	+	3.972E-01	1.27E-01	G
		74.81	8.566E-01	&	7.937E-01	2.46E-01	G
PB-214	6.2997E-01						
		351.99	6.516E-01	(	1.141E-01	4.99E-02	G K
		295.22	5.881E-01	(	2.274E-01	8.03E-02	G
							Energy duplication
		77.11	1.286E+00	+	6.496E-01	2.08E-01	G
		241.92	1.016E+00	+	6.939E-01	2.22E-01	G
BI-212	2.8892E-01						
		727.17	2.889E-01	%(	5.012E-01	1.54E-01	G K
		1620.56	3.011E-01	&	1.621E+00	4.37E-01	G
		785.42	6.175E-01	%	2.740E+00	7.95E-01	G
BI-214	6.7885E-01						
		609.32	6.789E-01	(	1.326E-01	6.93E-02	G K
		1764.51	1.221E+00	+	1.636E-01	1.65E-01	G
		1120.28	1.210E+00	+	4.436E-01	2.03E-01	G
RA-224	1.3049E+00						
		241.00	1.305E+00	(	1.278E+00	4.00E-01	G
RA-226	1.1745E+00						
		185.99	1.175E+00	(	1.350E+00	4.19E-01	G
AC-228	8.1779E-01						
		911.07	8.501E-01	*(	2.470E-01	1.20E-01	G K
		968.90	1.369E+00	+	4.299E-01	2.17E-01	G
		338.40	7.398E-01	(	3.232E-01	1.21E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-6.4798E-02						
		236.00	-6.480E-02	%(	4.675E-01	1.39E-01	G K
		256.25	3.808E-03	&	5.879E-01	1.71E-01	G
PA-234	-1.9132E-02						
		98.44	-1.913E-02	&(	1.861E-01	5.54E-02	G K
		946.00	-2.652E-02	&	3.460E-01	9.80E-02	G
		131.28	-5.963E-02	&	2.492E-01	7.48E-02	G
		94.67	2.400E-02	%	3.493E-01	1.04E-01	G
		883.24	-1.058E-01	&	5.052E-01	1.46E-01	G
		926.70	-1.182E-02	%	4.613E-01	1.26E-01	G
		569.26	1.060E-02	&	3.791E-01	1.06E-01	G
TH-234	1.3743E+00						
		63.29	1.043E+00	%(	2.388E+00	7.23E-01	G K
		92.80	1.805E+00	(	1.849E+00	5.73E-01	G
		92.38	-3.660E-02	%	2.328E+00	6.93E-01	G
AM-241	-1.8408E-02						
		59.54	-1.841E-02	%(P	3.312E-01	9.84E-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	-3.0966E-02	-3.9340E-02	4.7187E-01	4.7187E-01	4.321E-01
K-40		1.7542E+01	1.7542E+01	2.1704E+00	2.3860E+00	
MN-54	#A	2.5819E-02	2.6897E-02	4.9547E-02	4.9570E-02	5.203E-02
CO-57	#B	-1.9706E-02	-2.0661E-02	5.1975E-02	5.1987E-02	5.141E-02
CO-60	#B	-1.3004E-02	-1.3090E-02	3.1047E-01	3.1047E-01	6.827E-02
Sr-85	#A	-2.3698E-02	-2.8862E-02	7.3990E-02	7.4008E-02	6.760E-02
Kr-85	#A	-5.4706E+02	-5.4713E+02	1.4027E+03	1.4030E+03	1.561E+03
Y-88	#B	-9.1033E-04	-1.0263E-03	6.1578E-03	6.1581E-03	2.720E-02
NB-94	#B	1.8349E-03	1.8349E-03	5.1917E-02	5.1917E-02	6.183E-02
Ag-108M	#B	-1.8850E-03	-1.8855E-03	9.3898E-02	9.3898E-02	1.077E-01
CD-109	#A	1.6020E-02	1.6479E-02	1.4148E+00	1.4148E+00	1.543E+00
SN-113	#B	-8.2320E-03	-9.1988E-03	1.0972E-01	1.0973E-01	7.496E-02
SB-125	#B	1.0188E-01	1.0317E-01	1.1125E-01	1.1140E-01	1.526E-01
I-131	#B	1.5008E-02	7.3584E-02	2.0167E-01	2.0172E-01	4.607E-02
CS-134	#B	3.1046E-03	3.1577E-03	3.3254E-02	3.3255E-02	3.902E-02
CS-137	#A	4.2677E-04	4.2726E-04	4.7182E-02	4.7182E-02	5.642E-02
CE-139	#A	1.4002E-02	1.5366E-02	5.4326E-02	5.4333E-02	5.510E-02
EU-152	#B	-1.0938E-03	-1.0968E-03	1.4158E-01	1.4158E-01	1.589E-01
EU-154	#B	1.0909E-03	1.0954E-03	1.0661E-01	1.0661E-01	1.193E-01
EU-155	#B	7.4656E-03	7.5184E-03	1.7581E-01	1.7581E-01	1.953E-01
HG-203	#B	-6.1697E-03	-8.1174E-03	2.9036E-01	2.9036E-01	5.335E-02
TL-208		2.7672E-01	2.7672E-01	8.4716E-02	8.6147E-02	
PB-212	#	5.4101E-01	5.4101E-01	1.2358E-01	1.2730E-01	1.072E-01
PB-214	#	6.2997E-01	6.2997E-01	1.4471E-01	1.4902E-01	1.141E-01
BI-212	#B	2.8892E-01	2.8892E-01	4.6271E-01	4.6300E-01	5.012E-01
BI-214		6.7885E-01	6.7885E-01	2.0789E-01	2.1140E-01	
RA-224		1.3049E+00	1.3049E+00	1.2008E+00	1.2031E+00	
RA-226	#A	1.1745E+00	1.1745E+00	1.2557E+00	1.2575E+00	1.350E+00
AC-228		8.1779E-01	8.1779E-01	2.6527E-01	2.6926E-01	
TH-227	#B	-6.4798E-02	-6.4798E-02	4.1679E-01	4.1681E-01	4.675E-01
PA-234	#B	-1.9132E-02	-1.9132E-02	1.6607E-01	1.6607E-01	1.861E-01
TH-234	#B	1.3743E+00	1.3743E+00	1.3081E+00	1.3103E+00	2.388E+00
AM-241	#A	-1.8406E-02	-1.8408E-02	3.1972E-01	3.1972E-01	3.312E-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

Yankee Chemistry Spectrum name: 101F_21DEC2004_1820.An1

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

Total Activity (269.6 to 1999.1 keV) 2.0620029E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 2.0620029E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_21DEC2004_1940.An1

Sample description
Detector 101 FSS OOL-04-01-001-F

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_21DEC2004_1940.An1

Acquisition information
Start time: 21-Dec-2004 19:29:46
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: 1.1860E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.1860E+03) =
8.4317E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_21DEC2004_1940.An1

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	03-Dec-2004 13:55:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1466

***** 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	168.	25.85	1.50	1.654E-02	70.83	3.520	4.721E+00	HG203
					72.87	6.400	2.471E+00	HG203
					74.81	9.600	1.207E+00	PB212
76.95	330.	12.93	1.50	1.720E-02	77.11	10.700	2.041E+00	PB214
					77.11	17.500	1.248E+00	PB212
76.95	330.	12.93	1.50	1.720E-02	77.11	10.700	2.041E+00	PB214
					77.11	17.500	1.248E+00	PB212
83.76	66.	40.85	1.30	1.866E-02				
86.99	147.	18.01	1.01	1.920E-02	86.45	32.740	2.705E-01	EU155
89.98	86.	28.30	1.02	1.960E-02				
93.35	109.	23.55	1.02	1.997E-02	92.38	2.570	2.428E+00	TH234
					92.80	3.000	2.075E+00	TH234
185.81	138.	21.15	1.16	1.859E-02				
185.81	138.	21.15	1.16	1.859E-02	185.99	3.280	2.572E+00	RA226
209.29	85.	30.62	1.58	1.722E-02				
238.66	377.	9.07	1.50	1.540E-02	238.63	43.100	PBC<MDA	PB212
238.68	711.	4.26	1.12	1.557E-02	238.63	43.100	1.206E+00	PB212
241.52	116.	18.07	1.12	1.542E-02	241.00	3.900	2.200E+00	RA224
269.48	64.	36.39	1.30	1.404E-02				
295.30	192.	9.89	1.16	1.292E-02				
295.30	192.	9.89	1.16	1.292E-02	295.22	19.200	8.824E-01	PB214
299.92	44.	33.98	1.16	1.274E-02				
338.24	107.	15.72	1.10	1.135E-02	338.40	12.010	8.944E-01	AC228
351.80	355.	7.34	1.02	1.093E-02				
351.80	355.	7.34	1.02	1.093E-02	351.99	37.100	9.974E-01	PB214
462.29	54.	29.28	1.23	8.363E-03				

462.29	54.	29.28	1.23	8.363E-03	463.51	10.000	7.413E-01	SB125
510.64	125.	16.78	1.55	7.592E-03	510.72	22.500	8.340E-01	TL208
583.07	207.	10.38	1.24	6.685E-03	583.14	86.000	4.095E-01	TL208
609.18	234.	8.57	1.23	6.414E-03	609.32	46.090	9.021E-01	BI214
661.63	161.	11.75	1.35	5.937E-03	661.62	84.620	3.660E-01	CS137
727.00	79.	18.77	2.12	5.444E-03	727.17	11.800	1.402E+00	BI212
910.98	117.	12.12	1.81	4.447E-03	911.07	29.000	1.034E+00	AC228
968.42	85.	17.56	1.18	4.214E-03	968.90	17.460	1.320E+00	AC228

Yankee Chemistry Spectrum name: 101F_21DEC2004_1940.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1120.01	75.	19.48	1.85	3.712E-03	1120.28	15.040	1.523E+00	BI214
1460.36	492.	4.78	1.86	2.943E-03	1460.75	10.700	1.782E+01	K40
1764.26	45.	15.97	1.19	2.481E-03	1764.51	15.920	1.295E+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
173.56	87.16	279.	147.	0.074	54.02	1.014	PB-214 lD
179.54	90.15	256.	86.	0.043	84.91	1.016	PB-214 lD
418.25	209.29	237.	85.	0.043	91.87	1.585	AC-228 s
477.06	238.66	103.	711.	0.355	12.79	1.122	PB-212 D
482.75	241.51	163.	116.	0.058	54.20	1.124	PB-214 D
538.69	269.48	184.	64.	0.032	109.17	1.301	AC-228 s
599.58	299.81	90.	44.	0.022	101.95	1.165	TH-227 lD

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

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
HG-203	146.58	73.51	848.	-116.	-0.058	110.03	1.499
PB-212	149.41	74.92	861.	168.	0.084	77.55	1.499
PB-214	153.79	77.11	745.	330.	0.165	38.80	1.499D
PB-212	153.79	77.11	745.	330.	0.165	38.80	1.499D
TH-234	185.70	93.06	715.	127.	0.064	93.07	1.499s
TH-234	185.65	93.03	689.	128.	0.064	90.75	1.499s
RA-226	371.72	186.03	367.	113.	0.057	76.95	1.499
PB-212	477.06	238.68	326.	564.	0.282	18.54	1.499
RA-224	483.09	241.69	401.	96.	0.048	93.56	1.499
PB-214	477.02	238.66	396.	377.	0.188	27.21	1.499
PB-214	590.35	295.30	186.	161.	0.081	42.97	1.499
AC-228	676.26	338.24	88.	107.	0.054	47.17	1.098
PB-214	703.63	351.92	121.	297.	0.149	23.42	1.499s
SB-125	925.47	462.79	76.	45.	0.022	93.54	1.499s
TL-208	1021.22	510.64	90.	125.	0.062	50.34	1.552s
TL-208	1166.14	583.07	74.	207.	0.103	31.13	1.238
BI-214	1218.40	609.18	56.	234.	0.117	25.71	1.231s
CS-137	1323.35	661.63	60.	161.	0.081	35.24	1.348s
BI-212	1454.16	727.00	44.	79.	0.040	56.30	2.120s

Yankee Chemistry Spectrum name: 101F_21DEC2004_1940.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1822.31	910.98	28.	117.	0.058	36.35	1.808
AC-228	1937.25	968.42	41.	85.	0.043	52.69	1.183
BI-214	2240.61	1120.01	41.	75.	0.037	58.45	1.852
K-40	2921.73	1460.36	18.	492.	0.246	14.33	1.856
BI-214	3529.96	1764.26	2.	45.	0.022	47.91	1.190s

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		1.7046E-01					
			477.56	1.705E-01	%(	7.952E-01 2.34E-01 G	
K-40		1.7824E+01					
			1460.75	1.782E+01	(	8.036E-01 8.51E-01 G	
MN-54		-7.6011E-03					
			834.81	-7.601E-03	%(	6.178E-02 1.73E-02 G	
CO-57		1.8757E-02					
			122.07	1.876E-02	%(P	4.795E-02 1.44E-02 G K	
			136.43	1.358E-02	%	5.941E-01 1.76E-01 G	
CO-60		-1.6791E-03					
			1332.51	-1.679E-03	%(P	8.387E-02 2.04E-02 G K	
			1173.23	2.503E-02	% P	1.105E-01 3.10E-02 G K	
Sr-85		-2.4261E-02					
			514.00	-2.426E-02	%(	1.055E-01 3.12E-02 G	
Kr-85		-4.6093E+02					
			513.99	-4.609E+02	%(	2.004E+03 5.93E+02 G	
Y-88		-1.9355E-03					
			1836.01	-1.935E-03	%(P	9.616E-02 2.45E-02 G K	
			898.02	-6.366E-03	& P	8.081E-02 2.20E-02 G	
NB-94		4.0910E-05					
			871.10	4.091E-05	%(	5.942E-02 1.60E-02 G K	
			702.50	-1.633E-02	%	7.837E-02 2.29E-02 G K	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-6.1724E-02						
		722.95	-6.172E-02	%(	1.180E-01	3.59E-02	G K
		614.37	-4.633E-03	%	7.579E-02	2.16E-02	G
		433.93	1.758E-02	%	6.004E-02	1.78E-02	G
CD-109	1.5771E-01						
		88.04	1.577E-01	%(	2.287E+00	6.83E-01	G
SN-113	-1.1780E-02						
		391.71	-1.178E-02	&(P	1.092E-01	3.16E-02	G K
		255.04	2.334E-01	%	2.862E+00	8.40E-01	G
SB-125	1.4720E-01						
		427.95	-1.286E-02	%(	2.104E-01	6.08E-02	G K
		600.77	-1.027E-02	&	3.864E-01	1.10E-01	G
		636.15	1.808E-01	&	4.619E-01	1.38E-01	G
		463.51	6.210E-01	@(	5.977E-01	1.94E-01	G
		176.29	2.148E-01	%	9.066E-01	2.71E-01	G
I-131	-5.0741E-02						
		364.48	-5.074E-02	&(	3.429E-01	1.00E-01	G K
		636.97	1.294E+00	&	3.333E+00	9.94E-01	G
		284.29	-1.206E-01	%	4.516E+00	1.32E+00	G
CS-134	5.8694E-03						
		604.66	5.869E-03	%(	1.989E-01	5.90E-02	G K
		795.76	5.006E-02	%	6.621E-02	2.13E-02	G
		569.29	6.784E-02	%	3.846E-01	1.11E-01	G
		801.84	1.354E-01	&	7.816E-01	2.24E-01	G
CS-137	3.6599E-01						
		661.62	3.660E-01	@(	8.797E-02	4.30E-02	G
CE-139	-4.4367E-03						
		165.85	-4.437E-03	%(P	7.820E-02	2.31E-02	G
EU-152	4.7322E-02						
		121.78	4.732E-02	%(	1.904E-01	5.70E-02	G K
		344.30	4.464E-02	%	2.034E-01	6.00E-02	G
		1408.08	1.935E-01	%	2.858E-01	9.29E-02	G
		964.00	-7.925E-04	%	8.262E-01	2.36E-01	G
		1112.07	-3.112E-02	%	6.518E-01	1.81E-01	G
		778.90	1.699E-01	%	4.443E-01	1.32E-01	G
EU-154	-4.8368E-02						
		123.10	-4.837E-02	&(	1.556E-01	4.68E-02	G K
		1274.80	5.605E-02	&	2.439E-01	7.00E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	-1.437E-01	%	4.857E-01	1.44E-01	G
		1004.80	7.003E-02	%	4.040E-01	1.14E-01	G
EU-155	2.3443E-02						
		86.45	2.344E-02	%(	2.591E-01	7.74E-02	G K
		105.31	7.256E-02	%	2.851E-01	8.55E-02	G
HG-203	3.7573E-02						
		279.17	3.757E-02	%(P	8.704E-02	2.61E-02	G K
		72.87	-6.916E-01	%	2.365E+00	7.13E-01	G
		70.83	-3.258E+00	+	3.886E+00	1.20E+00	G
		82.50	-1.300E+00	%	4.848E+00	1.46E+00	G
TL-208	4.0949E-01						
		583.14	4.095E-01	(	8.504E-02	4.25E-02	G
		510.72	8.340E-01	+	3.130E-01	1.40E-01	G
PB-212	9.5787E-01						
		238.63	9.579E-01	(	1.474E-01	5.92E-02	G K
							Energy duplication
		77.11	1.248E+00	+	4.915E-01	1.61E-01	G
		74.81	1.207E+00	&	1.001E+00	3.12E-01	G
PB-214	8.0334E-01						
		351.99	8.356E-01	@(	1.515E-01	6.52E-02	G K
		295.22	7.410E-01	(	3.046E-01	1.06E-01	G
							Energy duplication
		77.11	2.041E+00	+	8.039E-01	2.64E-01	G
		241.92	3.731E+00	+	9.447E-01	3.38E-01	G
BI-212	1.4015E+00						
		727.17	1.402E+00	(	5.965E-01	2.63E-01	G K
		1620.56	-1.397E-01	%	2.620E+00	6.84E-01	G
		785.42	3.623E-01	%	3.336E+00	9.42E-01	G
BI-214	9.0210E-01						
		609.32	9.021E-01	@(	1.449E-01	7.73E-02	G K
		1764.51	1.295E+00	+	2.729E-01	2.07E-01	G
		1120.28	1.523E+00	+	6.675E-01	2.97E-01	G
RA-224	1.8170E+00						
		241.00	1.817E+00	(	1.816E+00	5.67E-01	G
RA-226	2.1214E+00						
		185.99	2.121E+00	(	1.719E+00	5.44E-01	G
AC-228	1.1414E+00						
		911.07	1.034E+00	(	2.418E-01	1.25E-01	G K
		968.90	1.320E+00	(	5.031E-01	2.32E-01	G
		338.40	8.944E-01	-	3.881E-01	1.41E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-1.4214E-01						
		236.00	-1.421E-01	%(	6.425E-01	1.92E-01	G K
		256.25	3.432E-03	&	6.433E-01	1.86E-01	G
PA-234	-2.2055E-02						
		98.44	-2.206E-02	%(	2.634E-01	7.84E-02	G K
		946.00	-1.512E-02	%	3.831E-01	1.06E-01	G
		131.28	-2.043E-03	&	2.904E-01	8.59E-02	G
		94.67	-1.319E-01	%	4.821E-01	1.45E-01	G
		883.24	-1.322E-01	%	7.042E-01	2.03E-01	G
		926.70	5.102E-02	&	6.435E-01	1.79E-01	G
		569.26	9.171E-02	%	6.016E-01	1.74E-01	G
TH-234	1.8570E+00						
		63.29	7.531E-01	&(	3.270E+00	9.81E-01	G K
		92.80	2.449E+00	(	2.387E+00	7.41E-01	G
		92.38	2.841E+00	&(	2.843E+00	8.81E-01	G
AM-241	6.9204E-03						
		59.54	6.920E-03	&(P	3.919E-01	1.16E-01	G

(- This peak used in the nuclide activity average.

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

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

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

- -

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

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.3454E-01	1.7046E-01	7.0052E-01	7.0059E-01	6.276E-01
K-40		1.7824E+01	1.7824E+01	2.5549E+00	2.7462E+00	
MN-54	#A	-7.2996E-03	-7.6011E-03	5.1811E-02	5.1813E-02	5.933E-02
CO-57	#B	1.7900E-02	1.8757E-02	4.3274E-02	4.3287E-02	4.576E-02
CO-60	#B	-1.6681E-03	-1.6791E-03	7.0724E-02	7.0724E-02	8.332E-02
Sr-85	#A	-1.9965E-02	-2.4261E-02	9.3668E-02	9.3678E-02	8.682E-02
Kr-85	#A	-4.6087E+02	-4.6093E+02	1.7797E+03	1.7799E+03	2.004E+03
Y-88	#B	-1.7191E-03	-1.9355E-03	3.9800E-01	3.9800E-01	8.541E-02
NB-94	#B	4.0910E-05	4.0910E-05	4.8029E-02	4.8029E-02	5.942E-02
Ag-108M	#B	-6.1707E-02	-6.1724E-02	1.0783E-01	1.0789E-01	1.179E-01
CD-109	#A	1.5337E-01	1.5771E-01	2.0484E+00	2.0484E+00	2.224E+00
SN-113	#B	-1.0555E-02	-1.1780E-02	1.4382E-01	1.4382E-01	9.781E-02
SB-125	#B	1.4537E-01	1.4720E-01	1.3770E-01	1.3795E-01	2.078E-01
I-131	#B	-1.0537E-02	-5.0741E-02	3.0132E-01	3.0133E-01	7.121E-02
CS-134	#B	5.7717E-03	5.8694E-03	1.7687E-01	1.7687E-01	1.956E-01
CS-137	#	3.6557E-01	3.6599E-01	1.2897E-01	1.3062E-01	
CE-139	#A	-4.0471E-03	-4.4367E-03	7.3010E-02	7.3010E-02	7.133E-02
EU-152	#B	4.7193E-02	4.7322E-02	1.7113E-01	1.7115E-01	1.899E-01
EU-154	#B	-4.8172E-02	-4.8368E-02	1.4041E-01	1.4044E-01	1.549E-01
EU-155	#B	2.3280E-02	2.3443E-02	2.3217E-01	2.3218E-01	2.573E-01
HG-203	#B	2.8647E-02	3.7573E-02	7.8334E-02	7.8363E-02	6.636E-02
TL-208		4.0949E-01	4.0949E-01	1.2747E-01	1.2955E-01	
PB-212	#	9.5787E-01	9.5787E-01	1.7757E-01	1.8563E-01	1.474E-01
PB-214	#	8.0334E-01	8.0334E-01	1.8817E-01	1.9357E-01	1.515E-01
BI-212	#	1.4015E+00	1.4015E+00	7.8905E-01	7.9301E-01	
BI-214		9.0210E-01	9.0210E-01	2.3188E-01	2.3742E-01	
RA-224	#	1.8170E+00	1.8170E+00	1.7000E+00	1.7031E+00	1.816E+00
RA-226	#	2.1213E+00	2.1214E+00	1.6324E+00	1.6368E+00	1.719E+00
AC-228		1.1414E+00	1.1414E+00	3.6532E-01	3.7097E-01	
TH-227	#B	-1.4214E-01	-1.4214E-01	5.7623E-01	5.7629E-01	6.425E-01
PA-234	#B	-2.2055E-02	-2.2055E-02	2.3530E-01	2.3530E-01	2.634E-01
TH-234	#B	1.8570E+00	1.8570E+00	1.6852E+00	1.6884E+00	3.270E+00
AM-241	#A	6.9199E-03	6.9204E-03	3.4804E-01	3.4804E-01	3.919E-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

Yankee Chemistry Spectrum name: 101F_21DEC2004_1940.An1

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

Total Activity (269.1 to 1999.1 keV) 2.2043650E+01 pCi/gm
Total Decayed Activity (269.1 to 1999.1 keV) 2.2044069E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

YAEC Chemistry Lab Spectrum name: 101F_22DEC2004_1520.An1

Sample description
Detector 101 FSS-OOL-04-01-007-F

Spectrum Filename: C:\GammaVision\Spectra\101F_22DEC2004_1520.An1

Acquisition information

Start time:	22-Dec-2004 15:14:32
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:	YAEC_OperatingSpectrumRevA.Lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters

Analysis engine:	wan32 G53W2.06
Start channel:	100 (50.23keV)
Stop channel:	4048 (2023.09keV)
Peak rejection level:	100.000%
Peak search sensitivity:	3
Sample Size:	1.3810E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.3810E+03) = 7.2411E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	best method (based on spectrum).

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

Corrections	Status	Comments
Decay correct to date:	YES	06-Dec-2004 11:38:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

Energy Calibration
Normalized diff: 0.1220

********** 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	
167.97	84.21	262.	46.	0.023	155.54	1.012	TA-182	D
174.15	87.30	223.	122.	0.061	58.35	1.014	PB-214	D
179.48	89.96	207.	94.	0.047	72.15	1.016	PB-214	D
397.83	199.08	78.	46.	0.023	123.40	1.621	SE-75	sM
417.57	208.95	68.	115.	0.058	55.65	1.215	AC-228	s
540.32	270.30	45.	37.	0.019	119.44	1.167	AC-228	
925.19	462.65	25.	30.	0.015	98.32	1.048	CS-138	

s - Peak fails shape tests.
D - Peak area deconvoluted.
M - Peak is close to a library peak.

This section based on library: YAEC_OperatingSpectrumRevA.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
AM-241	118.64	59.54	133.	3.	0.001	1610.61	0.994D
TH-234	126.14	63.29	185.	62.	0.031	100.36	0.997D
TA-182	135.46	67.95	120.	27.	0.014	218.58	0.952
HG-203	145.31	72.87	319.	10.	0.005	737.85	1.003D
PB-212	149.19	74.81	281.	171.	0.086	47.43	1.005D
BI-207	149.51	74.97	452.	0.	0.000	0.00	1.005D
PB-214	153.79	77.11	278.	326.	0.163	27.36	1.006D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PB-212	153.79	77.11	302.	0.	0.000	78.84	0.535D
CE-144	159.81	80.12	246.	1.	0.001	5050.62	1.009D
EU-155	172.48	86.45	357.	0.	0.000	0.00	1.013D
NP-237	172.56	86.49	350.	7.	0.004	1088.36	1.013D
CD-109	175.66	88.04	346.	8.	0.004	992.28	1.014D
TH-234	184.34	92.38	297.	0.	0.000	0.00	1.017D
TH-234	185.18	92.80	198.	82.	0.041	79.73	1.018D
NP-237	191.32	95.87	195.	15.	0.008	398.14	1.020D
Cm-243	198.69	99.55	202.	26.	0.013	237.30	1.023D
Cm-243	207.11	103.76	173.	31.	0.016	185.61	1.026D
EU-155	210.21	105.31	183.	27.	0.014	219.66	1.027D
TE-132	225.01	112.71	161.	39.	0.020	212.55	0.671s
TE-132	232.20	116.30	78.	0.	0.000	0.00	0.111D
Cm-243	235.45	117.92	147.	38.	0.019	208.80	1.000s
EU-152	243.16	121.78	132.	7.	0.003	743.22	1.039D
CO-57	243.74	122.07	113.	0.	0.000	0.00	1.039D
EU-154	245.80	123.10	147.	19.	0.010	273.16	1.040D
CE-144	268.59	134.49	118.	14.	0.007	457.99	0.514s
CO-57	272.48	136.43	110.	0.	0.000	0.00	0.611D
U-235	287.14	143.76	163.	0.	0.000	0.00	1.055D
CE-141	291.01	145.69	170.	0.	0.000	0.00	1.056
TE-131	300.93	150.65	164.	42.	0.021	209.71	1.176s
U-235	326.34	163.35	112.	0.	0.000	0.00	0.889D
CE-139	328.15	164.26	112.	44.	0.022	159.61	0.889s
SB-125	350.00	175.18	116.	55.	0.027	137.45	0.696s
U-235	371.10	185.72	253.	0.	0.000	0.00	1.084A
RA-226	371.64	185.99	116.	107.	0.053	51.81	1.509A
U-235	410.29	205.31	80.	0.	0.000	0.00	2.196D
TE-132	454.59	227.45	61.	3.	0.002	919.78	0.691s
TH-227	471.70	236.00	74.	7.	0.004	531.58	1.120D
PB-212	476.96	238.63	96.	586.	0.293	14.27	1.122D
RA-224	481.70	241.00	92.	53.	0.027	86.69	1.955A
PB-214	483.54	241.92	134.	75.	0.037	9.75	1.124A
SN-113	509.79	255.04	82.	12.	0.006	327.46	1.133D
TH-227	512.21	256.25	82.	12.	0.006	337.89	1.134D
Cm-243	554.93	277.60	113.	17.	0.009	274.97	1.149D
HG-203	558.07	279.17	81.	19.	0.010	164.80	1.150D
J-131	566.00	283.13	45.	7.	0.004	422.09	0.000s
PB-214	590.49	295.37	90.	154.	0.077	39.34	1.137
CR-51	640.50	320.37	53.	6.	0.003	529.15	1.356
AC-228	676.84	338.53	72.	116.	0.058	47.69	1.112
EU-152	686.56	343.38	36.	18.	0.009	168.33	0.539s
PB-214	703.81	352.01	56.	270.	0.135	22.44	1.361
J-131	731.24	365.72	35.	7.	0.004	376.07	1.760s
SN-113	784.19	392.18	19.	29.	0.015	102.81	0.807s
SB-125	859.64	429.89	58.	16.	0.008	258.25	0.406s
Ag-108M	871.19	435.66	29.	4.	0.002	694.79	0.389s
TE-131	905.73	452.92	38.	27.	0.014	131.94	1.148s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-125	926.92	463.51	19.	0.	0.000	0.00	1.039D
TE-131	983.05	491.57	24.	12.	0.006	212.13	0.511s
TL-208	1021.38	510.72	57.	70.	0.035	58.36	1.311D
Kr-85	1027.92	513.99	51.	8.	0.004	404.79	1.313D
CS-134	1137.42	568.71	14.	4.	0.002	424.26	1.117
BI-207	1139.34	569.67	18.	0.	0.000	0.00	1.351
TL-208	1166.48	583.24	38.	164.	0.082	31.50	1.171s
SB-125	1201.57	600.77	15.	0.	0.000	0.00	0.734D
CS-134	1209.35	604.66	13.	18.	0.009	110.30	1.374D
BI-214	1218.68	609.32	18.	207.	0.104	22.55	1.378D
Ag-108M	1228.78	614.37	18.	5.	0.003	376.62	1.381D
SB-125	1272.36	636.15	7.	0.	0.000	0.00	0.000D
J-131	1272.00	635.97	7.	0.	0.000	0.00	0.000s
AG-110M	1315.58	657.75	17.	4.	0.002	481.50	1.410D
CS-137	1323.33	661.62	25.	37.	0.019	75.39	1.413D
NB-94	1400.26	700.07	20.	6.	0.003	385.14	0.792s
Ag-108M	1446.05	722.95	23.	2.	0.001	931.24	1.454D
EU-154	1446.75	723.30	23.	4.	0.002	606.81	1.454D
BI-212	1454.49	727.17	22.	30.	0.015	85.25	1.457D
EU-152	1560.50	780.15	20.	9.	0.004	248.70	0.697s
BI-212	1570.53	785.16	26.	16.	0.008	181.79	0.608s
CS-134	1591.75	795.76	18.	16.	0.008	132.19	1.502D
CS-134	1603.91	801.84	15.	3.	0.001	641.59	1.506D
CO-58	1622.00	810.88	5.	0.	0.000	0.00	0.000s
MN-54	1670.50	835.12	11.	9.	0.005	188.03	0.515s
MN-56	1690.94	845.33	10.	17.	0.009	116.61	1.249
NB-94	1741.57	870.63	4.	1.	0.001	830.66	0.656s
AG-110M	1764.17	881.92	19.	16.	0.008	162.79	0.534s
Y-88	1798.68	899.17	9.	9.	0.004	175.25	1.212s
AC-228	1822.80	911.22	20.	90.	0.045	41.22	1.710s
AG-110M	1873.33	936.48	5.	1.	0.001	679.15	0.500s
EU-152	1928.41	964.00	25.	21.	0.010	120.43	1.613D
AC-228	1938.21	968.90	25.	43.	0.022	66.65	1.616D
EU-154	2010.00	1004.77	5.	0.	0.000	0.00	0.000s
BI-207	2126.40	1062.94	8.	0.	0.000	1132.48	0.459s
FE-59	2195.62	1097.53	8.	17.	0.009	113.00	0.631s
EU-152	2224.72	1112.07	12.	1.	0.000	2526.18	1.708D
ZN-65	2231.62	1115.52	21.	3.	0.001	684.07	1.710D
BI-214	2241.15	1120.28	17.	31.	0.016	76.72	1.713D
TA-182	2243.15	1121.28	44.	0.	0.000	0.00	1.713D
TE-131	2292.25	1145.82	12.	6.	0.003	300.00	0.458s
CO-60	2345.17	1172.26	15.	0.	0.000	0.00	0.382s
TA-182	2376.60	1187.96	13.	7.	0.003	276.59	0.575s
TA-182	2442.48	1220.88	28.	12.	0.006	246.68	0.661s
EU-154	2557.01	1278.11	12.	7.	0.004	281.03	1.159s
FE-59	2582.41	1290.81	4.	8.	0.004	173.21	0.829s
CO-60	2666.48	1332.81	17.	14.	0.007	113.75	0.666s
AG-110M	2771.00	1385.04	2.	1.	0.001	624.50	0.000s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-152	2811.98	1405.52	8.	2.	0.001	879.77	0.630s
K-40	2922.05	1460.52	7.	458.	0.229	14.49	2.091
BI-212	3242.11	1620.44	1.	3.	0.002	223.61	0.700s
BI-214	3528.63	1763.60	0.	19.	0.009	68.82	1.561
MN-56	3622.00	1810.25	0.	0.	0.000	0.00	0.000s
Y-88	3672.00	1835.23	0.	4.	0.002	150.00	1.499s

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 microCi	Peak Energy keV	Peak Activity microCi	Peak Code	Peak MDA Value microCi	Comments
K-40		1.9658E-02	1460.75	1.966E-02	(	6.455E-04	G
CR-51		0.0000E+00	320.07	0.000E+00	%	4.206E-04	G
MN-54		2.6253E-05	834.81	2.625E-05	(	5.043E-05	G
MN-56		4.8899E-05	846.60	4.890E-05	&(	5.018E-05	G
			1811.20	0.000E+00	?	1.512E-04	G
FE-59		9.2084E-05	1099.22	1.078E-04	&(	1.007E-04	G
			1291.56	7.156E-05	?(	1.202E-04	G
CO-57		0.0000E+00	122.07	0.000E+00	} P	3.905E-05	G
			136.43	0.000E+00	%	3.140E-04	G
CO-58		0.0000E+00	810.75	0.000E+00	?	3.617E-05	G
CO-60		5.8721E-05	1332.51	5.872E-05	(P	9.322E-05	G
			1173.23	0.000E+00	& P	7.858E-05	G
Cm-243		1.0654E-04	277.60	1.204E-04	(	3.698E-04	G
			117.00	2.250E-04	}	3.506E-04	G
			103.76	8.905E-05	$(	1.815E-04	G
			99.55	1.211E-04	$(	3.184E-04	G
ZN-65		0.0000E+00	1115.52	0.000E+00	%	1.722E-04	G
Kr-85		0.0000E+00	513.99	0.000E+00	%	1.502E+00	G
Y-88		2.4728E-05	1836.01	2.135E-05	?(P	4.191E-05	G
			898.02	2.830E-05	&(P	5.361E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	0.0000E+00	871.10	0.000E+00	%		3.514E-05	G
		702.50	0.000E+00	&		5.665E-05	G
Ag-108M	0.0000E+00	722.95	0.000E+00	}		6.808E-05	G
		614.37	0.000E+00	%		5.270E-05	G
		433.93	0.000E+00	&		4.722E-05	G
AG-110M	0.0000E+00	657.75	0.000E+00	%		5.259E-05	G
		884.67	6.638E-05	&		9.284E-05	G
		937.48	0.000E+00	&		1.161E-04	G
		1384.27	0.000E+00	%		1.673E-04	G
CD-109	0.0000E+00	88.04	0.000E+00	%		1.649E-03	G
SN-113	6.2707E-05	391.71	6.271E-05	(P		4.893E-05	G
		255.04	0.000E+00	%		1.989E-03	G
SB-125	1.7701E-04	427.95	8.351E-05	&(		1.941E-04	G
		600.77	0.000E+00	!		2.323E-04	G
		636.15	0.000E+00	}		2.946E-04	G
		463.51	0.000E+00	&		3.701E-04	G
		176.29	6.163E-04	&(		5.928E-04	G
TE-131	9.9005E-05	149.72	4.021E-05	&(		5.973E-05	G
		452.32	2.344E-04	*(		2.729E-04	G
		1146.96	0.000E+00	&		1.413E-03	G
		492.66	4.265E-04	&(		9.078E-04	G
TE-132	0.0000E+00	228.16	0.000E+00	&		3.690E-05	G
		116.30	0.000E+00	}		1.440E-03	G
		111.76	1.355E-03	&		2.148E-03	G
J-131	0.0000E+00	364.48	0.000E+00	&		4.770E-05	G
		636.97	0.000E+00	}		4.546E-04	G
		284.29	0.000E+00	&		5.665E-04	G
CS-134	4.4637E-05	604.66	3.866E-05	(		4.178E-05	G
		795.76	5.147E-05	(		7.037E-05	G
		569.29	0.000E+00	}		2.580E-04	G
		801.84	0.000E+00	%		6.506E-04	G
CS-137	9.9770E-05	661.62	9.977E-05	(		6.984E-05	G
CE-139	3.7581E-05	165.85	3.758E-05	&(P		4.461E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-141	0.0000E+00	145.45	0.000E+00			8.651E-05	G
CE-144	0.0000E+00	133.53	0.000E+00	&		3.169E-04	G
		80.12	0.000E+00	%		3.568E-03	G
EU-152	2.0639E-04	121.78	0.000E+00	}		1.231E-04	G
		344.30	8.072E-05	&(		1.375E-04	G
		1408.08	0.000E+00	&		3.388E-04	G
		964.00	4.599E-04	$(		5.699E-04	G
		1112.07	0.000E+00	%		5.095E-04	G
		778.90	1.831E-04	&(		4.791E-04	G
EU-154	5.3888E-05	123.10	3.066E-05	(		9.338E-05	G
		1274.80	8.036E-05	&(		2.164E-04	G
		723.30	0.000E+00	}		3.172E-04	G
		1004.80	0.000E+00	?		2.471E-04	G
EU-155	8.0680E-05	86.45	0.000E+00	}		1.962E-04	G
		105.31	8.068E-05	$(		1.959E-04	G
TA-182	1.1424E-04	67.75	6.431E-05	?(		1.280E-04	G
		1121.28	0.000E+00	%		3.501E-04	G
		1221.42	1.648E-04	?(		3.890E-04	G
		1189.05	1.554E-04	&(		4.599E-04	G
HG-203	2.3214E-05	279.17	2.321E-05	(P		5.442E-05	G
		72.87	0.000E+00	%		1.141E-03	G
TL-208	3.8434E-04	583.14	3.843E-04	@(		7.345E-05	G
		510.72	5.521E-04	+		3.004E-04	G
PB-212	1.1796E-03	238.63	1.180E-03	(		9.714E-05	G
		77.11	0.000E+00	}		3.757E-04	Energy duplication
		74.81	1.457E-03	}		6.876E-04	G
PB-214	8.8073E-04	351.99	9.019E-04	(		1.248E-04	G
		295.22	8.398E-04	(		2.554E-04	G
		77.11	2.391E-03	}		5.906E-04	Energy duplication
		241.92	8.807E-04	}		6.663E-04	G
BI-207	0.0000E+00	569.67	0.000E+00	}		4.536E-05	G
		1063.62	0.000E+00	%		6.994E-05	G
		74.97	0.000E+00	}		2.148E-04	G
BI-212	6.1965E-04	727.17	6.360E-04	(		5.145E-04	G
		1620.56	5.497E-04	?(		1.350E-03	G
		785.42	2.130E-03	+		3.524E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-214	9.4773E-04	609.32	9.477E-04	(	1.021E-04		G
		1764.51	6.500E-04	-	2.521E-04		G
		1120.28	7.609E-04	-	5.250E-04		G
RA-224	1.1957E-03	241.00	1.196E-03	}(	1.948E-03		G
RA-226	2.3620E-03	185.99	2.362E-03	}(	1.173E-03		G
AC-228	9.4019E-04	911.07	9.379E-04	(	2.441E-04		G
		968.90	7.962E-04	(	4.751E-04		G
		338.40	1.155E-03	(	4.175E-04		G
TH-227	0.0000E+00	236.00	0.000E+00	%	3.285E-04		G
		256.25	0.000E+00	%	6.091E-04		G
TH-234	1.9230E-03	63.29	1.923E-03	(	2.045E-03		G
		92.80	1.862E-03	}	1.545E-03		G
		92.38	0.000E+00	}	2.199E-03		G
U-235	0.0000E+00	185.72	0.000E+00	}	1.034E-04		G
		143.76	0.000E+00	!	3.861E-04		G
		205.31	0.000E+00	!	7.337E-04		G
		163.35	0.000E+00	&	7.538E-04		G
NP-237	0.0000E+00	86.49	0.000E+00	}	4.852E-04		G
		95.87	0.000E+00	%	1.532E-03		G
AM-241	0.0000E+00	59.54	0.000E+00	%	P 2.461E-04		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
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

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
K-40		1.4235E+01	1.4235E+01	2.0629E+00	2.2141E+00
CR-51	<	3.0459E-01	4.5628E-01		
MN-54	A	1.9010E-02	1.9704E-02	3.7051E-02	3.7068E-02
MN-56	A	3.5408E-02	>12 Halflives	4.1291E-02	4.1339E-02
FE-59	A	6.6679E-02	8.5465E-02	8.8373E-02	8.8505E-02
CO-57	<	2.2735E-01	2.3698E-01		
CO-58	<	2.6191E-02	3.0679E-02		
CO-60	A	4.2521E-02	4.2769E-02	7.1374E-02	7.1415E-02
Cm-243	A	7.7145E-02	7.7219E-02	1.0499E-01	1.0508E-01
ZN-65	<	1.2473E-01	1.3059E-01		
Kr-85	<	1.0878E+03	1.0879E+03		
Y-88	#A	1.7906E-02	1.9889E-02	2.4773E-02	2.4799E-02
NB-94	<	2.5443E-02	2.5443E-02		
Ag-108M	<	3.8157E-02	3.8167E-02		
AG-110M	<	3.8078E-02	3.9823E-02		
CD-109	<	1.1944E+00	1.2242E+00		
SN-113	#	4.5407E-02	5.0045E-02	5.3558E-02	5.3633E-02
SB-125	#A	1.2818E-01	1.2960E-01	1.7814E-01	1.7829E-01
TE-131	#	7.1691E-02	>12 Halflives	7.7945E-02	7.8046E-02
TE-132	<	2.6717E-02	8.4053E-01		
J-131	<	3.4538E-02	1.3899E-01		
CS-134		3.2322E-02	3.2806E-02	2.8240E-02	2.8301E-02
CS-137		7.2245E-02	7.2319E-02	5.4524E-02	5.4677E-02
CE-139	#A	2.7213E-02	2.9521E-02	4.7269E-02	4.7299E-02
CE-141	<	6.2641E-02	8.8512E-02		
CE-144	<	2.2947E-01	2.3869E-01		
EU-152	C	1.4945E-01	1.4981E-01	1.6157E-01	1.6179E-01
EU-154	A	3.9021E-02	3.9162E-02	7.6741E-02	7.6771E-02
EU-155	A	5.8421E-02	5.8783E-02	1.2913E-01	1.2917E-01
TA-182	A	8.2724E-02	9.1182E-02	1.3077E-01	1.3087E-01
HG-203	A	1.6810E-02	2.1375E-02	4.4661E-02	4.4677E-02
TL-208		2.7831E-01	>12 Halflives	8.7671E-02	8.9070E-02
PB-212		8.5417E-01	>12 Halflives	1.2190E-01	1.3111E-01
PB-214		6.3775E-01	>12 Halflives	1.4309E-01	1.4755E-01
BI-207	<	5.0644E-02	5.0685E-02		

BI-212		4.4870E-01	>12 Halflives	3.8252E-01	3.8336E-01
BI-214		6.8627E-01	>12 Halflives	1.5474E-01	1.5952E-01
RA-224	#	8.6580E-01	1.8440E+01	1.9907E+04	1.6020E+01
RA-226	#	1.7103E+00	1.7104E+00	1.0375E+03	8.9144E-01
AC-228		6.8080E-01	>12 Halflives	2.0818E-01	2.1170E-01
TH-227	<	2.3789E-01	4.3569E-01		
TH-234	A	1.3925E+00	2.2158E+00	2.2237E+00	2.2271E+00
U-235	<	2.7956E-01	2.7956E-01		
NP-237	<	1.1097E+00	1.1097E+00		
AM-241	<	1.7821E-01	1.7823E-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 2023.1 keV) 1.9078299E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 3.7520565E+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_22DEC2004_1600.An1

Sample description
Detector 101 FSS-OOL-04-01-010-F

Spectrum Filename: C:\GammaVision\Spectra\101F_22DEC2004_1600.An1

Acquisition information

Start time:	22-Dec-2004 15:51:43
Live time:	2000
Real time:	2002
Dead time:	0.12 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration

Filename:	D1_1LSa.Clb

Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

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

Efficiency Calibration

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

Library Files

Main analysis library:	YAEC_OperatingSpectrumRevA.Lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters

Analysis engine:	wan32 G53W2.06
Start channel:	100 (50.23keV)
Stop channel:	4048 (2023.09keV)
Peak rejection level:	100.000%
Peak search sensitivity:	3
Sample Size:	1.3650E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.3650E+03) = 7.3260E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	best method (based on spectrum).

YAEC Chemistry Lab Spectrum name: 101F_22DEC2004_1600.An1

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

Corrections	Status	Comments
Decay correct to date:	YES	03-Dec-2004 13:45:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

Energy Calibration
Normalized diff: 0.1590

********** 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	
168.77	84.47	291.	51.	0.025	149.28	1.012	TA-182	D
174.13	87.15	331.	157.	0.078	54.79	1.014	PB-214	D
179.46	89.82	323.	116.	0.058	71.14	1.016	PB-214	D
257.97	129.15	239.	69.	0.035	100.95	1.044	AC-228	D
420.09	210.21	170.	162.	0.081	66.19	1.230	TH-227	s
540.76	270.52	148.	96.	0.048	102.31	1.589	AC-228	s
600.74	300.49	81.	72.	0.036	94.79	1.014	PB-212	s
656.51	328.37	86.	62.	0.031	79.78	1.290	RH-106M	
818.43	409.29	45.	38.	0.019	95.39	1.539	AC-228	s

s - Peak fails shape tests.
D - Peak area deconvoluted.

This section based on library: YAEC_OperatingSpectrumRevA.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
AM-241	118.64	59.54	211.	50.	0.025	129.51	0.994D
TH-234	126.14	63.29	269.	60.	0.030	122.60	0.996D
TA-182	134.81	67.62	287.	87.	0.043	128.03	1.008s
HG-203	145.31	72.87	368.	45.	0.022	186.90	1.003D
PB-212	149.19	74.81	361.	263.	0.132	35.78	1.005D
BI-207	149.51	74.97	624.	0.	0.000	0.00	1.005D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PB-214	153.79	77.11	366.	481.	0.240	21.73	1.006D
PB-212	153.79	77.11	442.	0.	0.000	71.43	0.512D
CE-144	159.81	80.12	258.	0.	0.000	0.00	0.497D
EU-155	172.48	86.45	507.	0.	0.000	0.00	1.013D
NP-237	172.56	86.49	488.	19.	0.009	507.77	1.013D
CD-109	175.66	88.04	498.	0.	0.000	0.00	1.014D
TH-234	184.34	92.38	491.	0.	0.000	0.00	1.017D
TH-234	185.18	92.80	317.	183.	0.092	46.72	1.018D
NP-237	191.32	95.87	306.	10.	0.005	737.98	1.020D
Cm-243	198.69	99.55	294.	36.	0.018	206.32	1.023D
Cm-243	207.11	103.76	282.	0.	0.000	0.00	1.026D
EU-155	210.21	105.31	244.	21.	0.011	317.55	1.027D
TE-132	222.35	111.37	395.	44.	0.022	225.86	0.858
TE-132	232.20	116.30	152.	0.	0.000	0.00	0.651D
Cm-243	236.12	118.26	168.	51.	0.025	158.17	0.885
EU-152	243.16	121.78	302.	25.	0.012	307.20	1.038D
CO-57	243.74	122.07	288.	0.	0.000	0.00	1.039D
EU-154	245.80	123.10	212.	30.	0.015	212.88	1.039D
CE-144	266.67	133.53	255.	12.	0.006	573.13	1.047D
CO-57	272.48	136.43	255.	37.	0.018	192.06	1.049D
U-235	287.14	143.76	236.	48.	0.024	143.12	1.054D
CE-141	290.52	145.45	266.	17.	0.009	404.81	1.055D
TE-131	299.07	149.72	270.	23.	0.011	310.42	1.058D
U-235	326.34	163.35	148.	0.	0.000	13630.65	1.068D
CE-139	331.34	165.85	197.	18.	0.009	336.27	1.070D
SB-125	351.95	176.15	150.	62.	0.031	132.59	0.543s
U-235	371.10	185.72	319.	262.	0.131	5.60	1.084A
RA-226	371.64	185.99	235.	0.	0.000	6503.85	1.259A
U-235	411.61	205.97	84.	29.	0.014	173.41	0.860
TE-132	454.22	227.27	102.	19.	0.009	235.79	0.898
TH-227	471.70	236.00	156.	30.	0.015	186.36	1.120D
PB-212	476.96	238.63	134.	867.	0.433	11.66	1.122D
RA-224	481.70	241.00	105.	88.	0.044	58.60	2.094A
PB-214	483.54	241.92	209.	101.	0.051	8.95	1.124A
SN-113	509.79	255.04	90.	0.	0.000	0.00	0.763D
TH-227	511.47	255.88	48.	15.	0.007	252.19	0.964
Cm-243	554.93	277.60	91.	62.	0.031	75.04	1.149D
HG-203	558.07	279.17	150.	0.	0.000	0.00	1.150D
J-131	567.13	283.70	75.	15.	0.007	354.96	0.577s
PB-214	590.40	295.33	134.	211.	0.106	34.52	1.203
CR-51	640.00	320.12	24.	0.	0.000	0.00	0.000s
AC-228	676.52	338.37	100.	167.	0.083	37.41	1.126
EU-152	689.57	344.89	40.	28.	0.014	161.78	1.406s
PB-214	703.58	351.89	126.	363.	0.182	22.50	1.165
J-131	728.81	364.50	35.	21.	0.010	171.13	1.277
SN-113	780.51	390.34	51.	34.	0.017	148.25	0.731s
SB-125	854.97	427.56	51.	27.	0.013	147.59	0.475s
Ag-108M	868.37	434.25	26.	3.	0.002	673.42	0.498s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TE-131	905.12	452.62	50.	18.	0.009	205.03	0.641s
SB-125	926.64	463.37	60.	47.	0.023	91.84	1.086s
TE-131	981.63	490.85	48.	14.	0.007	255.82	0.611s
TL-208	1021.38	510.72	55.	89.	0.045	47.30	1.311D
Kr-85	1027.92	513.99	67.	4.	0.002	799.23	1.313D
CS-134	1138.58	569.29	50.	0.	0.000	0.00	0.644D
BI-207	1137.04	568.52	50.	26.	0.013	146.19	0.644s
TL-208	1166.28	583.13	72.	242.	0.121	26.87	1.478
SB-125	1201.57	600.77	29.	11.	0.005	236.34	1.372D
CS-134	1209.35	604.66	30.	5.	0.003	444.59	1.374D
BI-214	1218.68	609.32	30.	273.	0.137	20.04	1.378D
Ag-108M	1228.78	614.37	33.	2.	0.001	1212.95	1.381D
SB-125	1265.19	632.57	21.	7.	0.004	300.00	0.655s
J-131	1274.00	636.97	29.	0.	0.000	0.00	1.396
AG-110M	1315.58	657.75	34.	3.	0.002	758.98	1.410D
CS-137	1323.33	661.62	31.	67.	0.034	50.83	1.413D
NB-94	1404.03	701.95	43.	13.	0.006	268.19	0.999
Ag-108M	1446.05	722.95	42.	8.	0.004	337.76	1.454D
EU-154	1446.75	723.30	46.	3.	0.001	1154.73	1.454D
BI-212	1454.49	727.17	38.	29.	0.014	106.87	1.457D
EU-152	1558.33	779.06	8.	0.	0.000	1028.35	0.377s
BI-212	1571.00	785.39	24.	22.	0.011	132.21	1.041s
CS-134	1591.75	795.76	29.	25.	0.013	108.51	1.502D
CS-134	1603.91	801.84	25.	2.	0.001	1207.68	1.506D
CO-58	1622.00	810.88	4.	0.	0.000	0.00	0.000s
MN-54	1671.35	835.54	17.	24.	0.012	101.50	0.841s
MN-56	1693.00	846.36	6.	0.	0.000	0.00	0.000s
NB-94	1744.94	872.32	14.	4.	0.002	439.46	0.935s
AG-110M	1770.89	885.28	8.	2.	0.001	781.02	0.626s
Y-88	1796.00	897.83	5.	0.	0.000	0.00	0.000s
AC-228	1822.33	910.99	37.	149.	0.075	34.27	1.406
AG-110M	1873.52	936.57	21.	11.	0.005	218.66	0.660s
EU-152	1928.41	964.00	26.	21.	0.010	123.88	1.612D
AC-228	1938.21	968.90	28.	86.	0.043	41.30	1.616D
EU-154	2004.96	1002.26	20.	22.	0.011	127.31	1.432
BI-207	2128.00	1063.74	8.	2.	0.001	587.37	0.000s
FE-59	2197.73	1098.58	33.	27.	0.014	140.11	0.693s
EU-152	2224.72	1112.07	18.	2.	0.001	888.88	1.708D
ZN-65	2231.62	1115.52	36.	5.	0.002	573.62	1.710D
BI-214	2241.15	1120.28	30.	49.	0.024	64.26	1.713D
TA-182	2243.15	1121.28	67.	0.	0.000	0.00	1.713D
TE-131	2296.00	1147.69	9.	0.	0.000	0.00	0.000s
CO-60	2346.40	1172.87	26.	1.	0.001	259.32	0.641s
TA-182	2371.25	1185.29	26.	17.	0.009	175.88	0.500s
TA-182	2441.92	1220.60	30.	11.	0.005	260.17	0.476s
EU-154	2547.89	1273.56	11.	17.	0.009	125.38	1.284
FE-59	2584.92	1292.06	15.	12.	0.006	178.56	0.763s
CO-60	2668.00	1333.57	14.	0.	0.000	0.00	0.991s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AG-110M	2767.25	1383.17	1.	2.	0.001	300.00	0.903s
EU-152	2817.09	1408.07	3.	20.	0.010	80.96	0.602s
K-40	2922.28	1460.63	16.	642.	0.321	12.37	1.782
BI-212	3242.33	1620.55	3.	14.	0.007	109.26	0.637s
BI-214	3530.52	1764.54	4.	44.	0.022	53.04	1.088s
MN-56	3622.00	1810.25	0.	0.	0.000	0.00	0.000s
Y-88	3672.14	1835.30	1.	1.	0.000	422.09	0.880s

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 microCi	Peak Energy keV	Peak Activity microCi	Peak Code	Peak MDA Value microCi	Comments
K-40		2.7556E-02	1460.75	2.756E-02	(	9.164E-04	G
CR-51		0.0000E+00	320.07	0.000E+00	?	2.932E-04	G
MN-54		6.6571E-05	834.81	6.657E-05	(	6.220E-05	G
MN-56		0.0000E+00	846.60	0.000E+00	?	4.063E-05	G
			1811.20	0.000E+00	?	1.512E-04	G
FE-59		1.4799E-04	1099.22	1.712E-04	(	1.869E-04	G
			1291.56	1.177E-04	?(	1.961E-04	G
CO-57		2.2245E-04	122.07	0.000E+00	} P	6.108E-05	G
			136.43	2.224E-04	$(	4.698E-04	G
CO-58		0.0000E+00	810.75	0.000E+00	?	3.314E-05	G
CO-60		0.0000E+00	1332.51	0.000E+00	& P	8.659E-05	G
			1173.23	0.000E+00	% P	9.974E-05	G
Cm-243		4.4170E-04	277.60	4.417E-04	(	3.331E-04	G
			117.00	3.020E-04	}	3.737E-04	G
			103.76	0.000E+00	!	2.299E-04	G
			99.55	1.680E-04	-	3.819E-04	G
ZN-65		0.0000E+00	1115.52	0.000E+00	%	2.204E-04	G
Kr-85		0.0000E+00	513.99	0.000E+00	%	1.697E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Y-88	0.0000E+00	1836.01	0.000E+00	% P	4.295E-05		G
		898.02	0.000E+00	? P	4.124E-05		G
NB-94	0.0000E+00	871.10	0.000E+00	&	5.884E-05		G
		702.50	3.047E-05	?	8.031E-05		G
Ag-108M	0.0000E+00	722.95	0.000E+00	}	8.932E-05		G
		614.37	0.000E+00	%	6.922E-05		G
		433.93	0.000E+00	%	4.460E-05		G
AG-110M	0.0000E+00	657.75	0.000E+00	%	7.109E-05		G
		884.67	0.000E+00	%	6.288E-05		G
		937.48	9.689E-05	&	2.201E-04		G
		1384.27	0.000E+00	&	1.326E-04		G
CD-109	0.0000E+00	88.04	0.000E+00	!	1.969E-03		G
SN-113	7.3408E-05	391.71	7.341E-05	&(P	7.681E-05		G
		255.04	0.000E+00	&	2.079E-03		G
SB-125	2.8227E-04	427.95	1.350E-04	@(	1.827E-04		G
		600.77	1.195E-04	(	3.163E-04		G
		636.15	0.000E+00	}	4.715E-04		G
		463.51	7.614E-04	@(	6.287E-04		G
		176.29	6.892E-04	*(	6.710E-04		G
TE-131	0.0000E+00	149.72	0.000E+00	%	7.591E-05		G
		452.32	1.563E-04		3.096E-04		G
		1146.96	0.000E+00	%	1.231E-03		G
		492.66	5.095E-04	&	1.240E-03		G
TE-132	4.8900E-05	228.16	1.797E-05	&(	4.708E-05		G
		116.30	0.000E+00	}	1.978E-03		G
		111.76	1.528E-03	?(	3.311E-03		G
J-131	3.3081E-05	364.48	3.308E-05	?(	4.770E-05		G
		636.97	0.000E+00	}	8.405E-04		G
		284.29	0.000E+00	&	7.182E-04		G
CS-134	0.0000E+00	604.66	0.000E+00	%	6.052E-05		G
		795.76	7.938E-05		8.749E-05		G
		569.29	0.000E+00	}	4.546E-04		G
		801.84	0.000E+00	%	8.111E-04		G
CS-137	1.8023E-04	661.62	1.802E-04	(	7.700E-05		G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-139	0.0000E+00	165.85	0.000E+00	% P	5.837E-05		G
CE-141	0.0000E+00	145.45	0.000E+00	%	1.072E-04		G
CE-144	0.0000E+00	133.53	0.000E+00	%	4.592E-04		G
		80.12	0.000E+00	?	3.652E-03		G
EU-152	3.0341E-04	121.78	0.000E+00	}	1.830E-04		G
		344.30	1.256E-04	*(	1.443E-04		G
		1408.08	4.262E-04	?(	2.163E-04		G
		964.00	4.541E-04	$(	5.826E-04		G
		1112.07	0.000E+00	%	5.979E-04		G
		778.90	0.000E+00	%	3.147E-04		G
EU-154	1.7139E-04	123.10	4.742E-05	(	1.114E-04		G
		1274.80	1.971E-04	&(	2.072E-04		G
		723.30	0.000E+00	}	4.324E-04		G
		1004.80	4.046E-04	&(	4.383E-04		G
EU-155	0.0000E+00	86.45	0.000E+00	}	2.327E-04		G
		105.31	0.000E+00	%	2.249E-04		G
TA-182	2.2779E-04	67.75	2.072E-04	*(	1.945E-04		G
		1121.28	0.000E+00	%	4.254E-04		G
		1221.42	1.576E-04	(	4.046E-04		G
		1189.05	3.964E-04	&(	6.172E-04		G
HG-203	0.0000E+00	279.17	0.000E+00	% P	7.278E-05		G
		72.87	5.959E-04		1.224E-03		G
TL-208	5.9664E-04	583.14	5.677E-04	(	9.900E-05		G
		510.72	7.072E-04	(	2.939E-04		G
PB-212	1.7449E-03	238.63	1.745E-03	(	1.142E-04		G
		77.11	0.000E+00	}	4.519E-04		Energy duplication
		74.81	2.239E-03	}	7.765E-04		G
PB-214	1.1899E-03	351.99	1.210E-03	(	1.834E-04		G
		295.22	1.150E-03	(	3.084E-04		G
		77.11	3.530E-03	}	6.745E-04		Energy duplication
		241.92	1.190E-03	}	8.233E-04		G
BI-207	0.0000E+00	569.67	5.347E-05	}	7.162E-05		G
		1063.62	0.000E+00	%	7.183E-05		G
		74.97	0.000E+00	}	2.514E-04		G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-212	6.0268E-04	727.17	6.027E-04	(	6.593E-04		G
		1620.56	2.565E-03	+	1.976E-03		G
		785.42	2.929E-03	+	3.400E-03		G
BI-214	1.2326E-03	609.32	1.249E-03	(	1.291E-04		G
		1764.51	1.517E-03	+	3.980E-04		G
		1120.28	1.181E-03	(	6.857E-04		G
RA-224	1.9836E-03	241.00	1.984E-03	}(	2.313E-03		G
RA-226	0.0000E+00	185.99	0.000E+00	}	1.482E-03		G
AC-228	1.5896E-03	911.07	1.563E-03	(	3.248E-04		G
		968.90	1.588E-03	(	4.994E-04		G
		338.40	1.656E-03	(	4.889E-04		G
TH-227	2.1902E-04	236.00	2.286E-04	(	4.680E-04		G
		256.25	2.032E-04	?(	4.740E-04		G
TH-234	1.8526E-03	63.29	1.853E-03	(	2.450E-03		G
		92.80	4.154E-03	}	1.939E-03		G
		92.38	0.000E+00	}	2.807E-03		G
U-235	3.5292E-04	185.72	3.529E-04	}	1.156E-04		G
		143.76	2.970E-04	(	4.617E-04		G
		205.31	4.779E-04	&(	7.485E-04		G
		163.35	0.000E+00	%	8.596E-04		G
NP-237	0.0000E+00	86.49	0.000E+00	}	5.708E-04		G
		95.87	0.000E+00	%	1.905E-03		G
AM-241	2.1805E-04	59.54	2.181E-04	(P	3.067E-04		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
K-40		2.0187E+01	2.0187E+01	2.4970E+00	2.7452E+00
CR-51	<	2.1482E-01	3.4636E-01		
MN-54		4.8770E-02	5.0881E-02	5.1642E-02	5.1722E-02
MN-56	<	2.98E-02	>12 Halflives		
FE-59	#A	1.0842E-01	1.4538E-01	1.6499E-01	1.6519E-01
CO-57	A	1.6297E-01	1.7115E-01	3.2872E-01	3.2885E-01
CO-58	<	2.4278E-02	2.9268E-02		
CO-60	<	6.3438E-02	6.3875E-02		
Cm-243		3.2359E-01	3.2396E-01	2.4308E-01	2.4377E-01
ZN-65	<	1.6144E-01	1.7044E-01		
Kr-85	<	1.2433E+03	1.2435E+03		
Y-88	<	3.1468E-02	3.5626E-02		
NB-94	<	4.3108E-02	4.3108E-02		
Ag-108M	<	5.0714E-02	5.0728E-02		
AG-110M	<	5.2079E-02	5.4911E-02		
CD-109	<	1.4424E+00	1.4851E+00		
SN-113	#A	5.3779E-02	6.0330E-02	9.2568E-02	9.2631E-02
SB-125		2.0679E-01	2.0951E-01	1.6863E-01	1.6905E-01
TE-131	<	5.56E-02	>12 Halflives		
TE-132	#C	3.5824E-02	2.1104E+00	3.4454E+00	3.4474E+00
J-131	A	2.4235E-02	1.2564E-01	2.1501E-01	2.1512E-01
CS-134	<	4.4338E-02	4.5124E-02		
CS-137		1.3203E-01	1.3219E-01	6.7190E-02	6.7604E-02
CE-139	<	4.2762E-02	4.7081E-02		
CE-141	<	7.8545E-02	1.1819E-01		
CE-144	<	3.3644E-01	3.5247E-01		
EU-152	C	2.2228E-01	2.2291E-01	1.6292E-01	1.6341E-01
EU-154	C	1.2556E-01	1.2610E-01	1.1682E-01	1.1703E-01
EU-155	<	1.6474E-01	1.6595E-01		
TA-182		1.6688E-01	1.8723E-01	2.1165E-01	2.1190E-01

HG-203	<	5.3319E-02	7.0829E-02

TL-208		4.3710E-01	>12 Halflives	1.1745E-01	1.2002E-01
PB-212		1.2783E+00	>12 Halflives	1.4911E-01	1.6568E-01
PB-214		8.7169E-01	>12 Halflives	1.7958E-01	1.8621E-01
BI-207	<	5.2624E-02	5.2674E-02		
BI-212	A	4.4152E-01	>12 Halflives	4.7185E-01	4.7251E-01
BI-214		9.0299E-01	>12 Halflives	1.8098E-01	1.8803E-01
RA-224	#	1.4532E+00	5.3987E+01	3.7530E+04	3.1783E+01
AC-228		1.1646E+00	>12 Halflives	2.5395E-01	2.6234E-01
TH-227	A	1.6046E-01	3.2806E-01	5.1436E-01	5.1470E-01
TH-234	A	1.3572E+00	2.3500E+00	2.8811E+00	2.8840E+00
U-235	A	2.5855E-01	2.5855E-01	2.9067E-01	2.9103E-01
NP-237	<	1.3953E+00	1.3953E+00		
AM-241	A	1.5974E-01	1.5976E-01	2.0797E-01	2.0816E-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 2023.1 keV) 2.5187473E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 8.1136177E+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_22DEC2004_1640.An1

Sample description
Detector 101 FSS-OOL-04-01-015-F

Spectrum Filename: C:\GammaVision\Spectra\101F_22DEC2004_1640.An1

Acquisition information

Start time:	22-Dec-2004 16:29:12
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:	YAEC_OperatingSpectrumRevA.Lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters

Analysis engine:	wan32 G53W2.06
Start channel:	100 (50.23keV)
Stop channel:	4048 (2023.09keV)
Peak rejection level:	100.000%
Peak search sensitivity:	3
Sample Size:	9.6700E+02
Activity scaling factor:	1.0000E+06/(1.0000E+00* 9.6700E+02) = 1.0341E+03
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	best method (based on spectrum).

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

Corrections	Status	Comments
Decay correct to date:	YES	03-Dec-2004 13:50:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

Energy Calibration
Normalized diff: 0.0932

********** 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	
168.03	84.24	224.	54.	0.027	123.52	1.012	TA-182	D
173.73	87.09	202.	94.	0.047	71.26	1.014	PB-214	D
179.16	89.81	194.	62.	0.031	102.52	1.016	PB-214	D
325.09	162.72	119.	32.	0.016	154.54	1.068	BA-140	D
540.84	270.56	49.	59.	0.030	85.01	1.370	AC-228	s
655.73	327.98	40.	56.	0.028	88.73	1.206	AC-228	s
925.78	462.94	44.	57.	0.028	75.70	1.047	AC-228	s
1721.55	860.63	8.	21.	0.010	89.38	1.332	TL-208	

s - Peak fails shape tests.
D - Peak area deconvoluted.

This section based on library: YAEC_OperatingSpectrumRevA.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
AM-241	118.64	59.54	183.	22.	0.011	263.34	0.994D
TH-234	126.14	63.29	181.	72.	0.036	87.41	0.997D
TA-182	132.82	66.63	148.	2.	0.001	1982.42	0.417s
HG-203	145.31	72.87	134.	0.	0.000	0.00	0.723D
PB-212	149.19	74.81	222.	196.	0.098	38.75	1.005D
BI-207	149.51	74.97	304.	0.	0.000	0.00	0.000D
PB-214	153.79	77.11	242.	279.	0.139	29.71	1.006D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PB-212	153.79	77.11	292.	0.	0.000	131.82	0.507D
CE-144	159.81	80.12	164.	0.	0.000	0.00	0.668D
EU-155	172.48	86.45	299.	0.	0.000	0.00	1.013D
NP-237	172.56	86.49	299.	0.	0.000	0.00	1.013D
CD-109	175.66	88.04	293.	12.	0.006	587.12	1.014D
TH-234	184.34	92.38	322.	0.	0.000	0.00	1.017D
TH-234	185.18	92.80	217.	106.	0.053	65.43	1.018D
NP-237	191.32	95.87	205.	3.	0.002	1854.73	1.020D
Cm-243	198.69	99.55	178.	13.	0.007	438.31	1.023D
Cm-243	207.11	103.76	172.	0.	0.000	0.00	1.026D
EU-155	210.21	105.31	170.	11.	0.006	504.37	1.027D
TE-132	222.92	111.66	144.	79.	0.040	112.07	1.357s
TE-132	232.20	116.30	138.	0.	0.000	0.00	0.835D
Cm-243	237.02	118.71	133.	31.	0.015	242.80	1.831s
EU-152	243.16	121.78	108.	0.	0.000	0.00	1.039D
CO-57	243.74	122.07	88.	20.	0.010	198.59	1.039D
EU-154	245.80	123.10	139.	12.	0.006	424.43	1.040D
CE-144	266.67	133.53	99.	2.	0.001	1997.71	1.047D
CO-57	272.48	136.43	140.	23.	0.011	230.06	1.049D
U-235	287.14	143.76	134.	44.	0.022	120.73	1.054D
CE-141	290.52	145.45	125.	20.	0.010	242.32	1.055D
TE-131	299.07	149.72	180.	12.	0.006	489.67	1.058D
U-235	326.34	163.35	141.	0.	0.000	0.00	1.068D
CE-139	331.34	165.85	85.	2.	0.001	1750.55	1.070D
SB-125	346.15	173.25	170.	24.	0.012	273.10	0.301s
U-235	371.10	185.72	230.	208.	0.104	5.54	1.084A
RA-226	371.64	185.99	120.	0.	0.000	4647.58	1.440A
U-235	411.19	205.76	36.	18.	0.009	187.08	0.573s
TE-132	456.00	228.16	32.	1.	0.001	2100.00	0.000s
TH-227	471.70	236.00	108.	16.	0.008	282.02	1.120D
PB-212	476.96	238.63	72.	618.	0.309	13.40	1.122D
RA-224	481.70	241.00	100.	39.	0.020	117.97	1.582A
PB-214	483.54	241.92	113.	76.	0.038	8.79	1.124A
SN-113	509.79	255.04	24.	0.	0.000	0.00	0.000D
TH-227	513.50	256.89	45.	8.	0.004	356.74	0.480s
Cm-243	554.93	277.60	45.	30.	0.015	107.95	1.149D
HG-203	558.07	279.17	79.	2.	0.001	551.08	1.150D
J-131	568.09	284.18	48.	7.	0.004	434.95	0.365s
PB-214	590.37	295.31	58.	172.	0.086	31.05	1.083
CR-51	640.00	320.12	16.	2.	0.001	764.85	0.000s
AC-228	676.89	338.55	68.	87.	0.043	54.05	1.210
EU-152	687.00	343.61	23.	3.	0.002	577.06	0.000s
PB-214	703.63	351.92	76.	258.	0.129	25.94	1.305
J-131	728.90	364.55	23.	11.	0.005	220.06	0.532s
SN-113	782.00	391.08	15.	0.	0.000	0.00	0.333s
SB-125	861.00	430.57	46.	19.	0.010	191.08	0.000s
Ag-108M	867.50	433.81	25.	10.	0.005	257.38	0.593s
TE-131	901.13	450.62	40.	10.	0.005	332.33	0.853

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-125	926.92	463.51	44.	0.	0.000	0.00	1.047D
TE-131	984.00	492.04	8.	0.	0.000	0.00	0.083s
TL-208	1021.38	510.72	37.	62.	0.031	56.47	1.311D
Kr-85	1027.92	513.99	23.	3.	0.001	842.54	1.313D
CS-134	1138.58	569.29	38.	0.	0.000	0.00	1.350
BI-207	1136.45	568.23	14.	5.	0.002	344.50	0.476s
TL-208	1166.44	583.21	28.	154.	0.077	29.17	1.432
SB-125	1201.57	600.77	11.	0.	0.000	0.00	0.000D
CS-134	1209.35	604.66	25.	7.	0.003	338.35	1.374D
BI-214	1218.68	609.32	24.	186.	0.093	24.68	1.378D
Ag-108M	1228.78	614.37	20.	0.	0.000	0.00	0.000D
SB-125	1272.36	636.15	10.	0.	0.000	0.00	1.082D
J-131	1272.26	636.10	10.	6.	0.003	289.91	1.082
AG-110M	1315.58	657.75	10.	1.	0.000	1383.37	1.410D
CS-137	1323.33	661.62	18.	96.	0.048	36.04	1.413D
NB-94	1404.81	702.34	22.	12.	0.006	199.00	0.836s
Ag-108M	1445.79	722.82	12.	0.	0.000	0.00	1.454
EU-154	1446.75	723.30	13.	0.	0.000	0.00	1.454D
BI-212	1454.06	726.95	25.	38.	0.019	88.44	0.809s
EU-152	1553.11	776.45	8.	8.	0.004	204.94	0.406s
BI-212	1573.06	786.42	12.	12.	0.006	149.18	0.893s
CS-134	1587.33	793.56	10.	12.	0.006	155.46	0.750s
CS-134	1603.91	801.84	19.	0.	0.000	0.00	1.506
CO-58	1623.83	811.80	7.	1.	0.001	793.73	0.678s
MN-54	1670.22	834.98	4.	6.	0.003	187.08	0.882s
MN-56	1690.56	845.14	9.	18.	0.009	118.60	0.904s
NB-94	1743.00	871.35	4.	2.	0.001	503.62	0.793s
AG-110M	1772.44	886.06	15.	10.	0.005	212.13	0.525s
Y-88	1795.57	897.62	9.	0.	0.000	1135.78	0.656s
AC-228	1822.66	911.15	9.	109.	0.054	32.64	1.193s
AG-110M	1877.67	938.64	6.	6.	0.003	212.13	0.700s
EU-152	1928.41	964.00	15.	0.	0.000	0.00	1.284D
AC-228	1937.84	968.71	20.	49.	0.024	61.93	1.263
EU-154	2011.00	1005.27	5.	0.	0.000	0.00	0.000s
BI-207	2125.98	1062.73	6.	18.	0.009	101.38	3.007s
FE-59	2195.00	1097.22	12.	3.	0.002	574.46	0.417s
EU-152	2224.72	1112.07	7.	0.	0.000	0.00	0.000D
ZN-65	2231.62	1115.52	15.	8.	0.004	231.25	1.710D
BI-214	2241.15	1120.28	15.	31.	0.015	75.98	1.713D
TA-182	2243.15	1121.28	28.	0.	0.000	0.00	0.000D
TE-131	2295.00	1147.19	4.	0.	0.000	807.77	0.000s
CO-60	2345.59	1172.47	22.	0.	0.000	263.71	0.587s
TA-182	2377.60	1188.46	2.	0.	0.000	497.49	0.700s
TA-182	2444.67	1221.98	7.	0.	0.000	1014.89	1.285
EU-154	2549.81	1274.52	15.	8.	0.004	286.24	0.804s
FE-59	2585.00	1292.10	3.	0.	0.000	0.00	0.000s
CO-60	2664.39	1331.77	14.	11.	0.005	120.12	1.640
AG-110M	2770.85	1384.96	6.	13.	0.007	140.37	0.988s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-152	2812.33	1405.69	0.	9.	0.004	100.00	0.500s
K-40	2922.27	1460.63	7.	379.	0.190	15.88	1.983
BI-212	3242.00	1620.38	0.	2.	0.001	212.13	0.500s
BI-214	3530.23	1764.40	0.	26.	0.013	58.83	1.624
MN-56	3622.00	1810.25	0.	0.	0.000	0.00	0.000s
Y-88	3673.00	1835.73	0.	1.	0.000	300.00	0.500s

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 microCi	Peak Energy keV	Peak Activity microCi	Peak Code	Peak MDA Value microCi	Comments
K-40		1.6267E-02	1460.75	1.627E-02	(	6.455E-04	G
CR-51		0.0000E+00	320.07	0.000E+00	%	2.451E-04	G
MN-54		1.6877E-05	834.81	1.688E-05	?(	3.384E-05	G
MN-56		5.0816E-05	846.60	5.082E-05	&(	4.874E-05	G
			1811.20	0.000E+00	?	1.512E-04	G
FE-59		0.0000E+00	1099.22	0.000E+00	&	1.195E-04	G
			1291.56	0.000E+00	%	1.070E-04	G
CO-57		1.3823E-04	122.07	1.476E-05	} P	3.470E-05	G
			136.43	1.382E-04	(	3.524E-04	G
CO-58		0.0000E+00	810.75	0.000E+00	&	4.061E-05	G
CO-60		4.4599E-05	1332.51	4.460E-05	(P	8.659E-05	G
			1173.23	0.000E+00	% P	9.245E-05	G
Cm-243		2.1513E-04	277.60	2.151E-04	(	2.395E-04	G
			117.00	1.836E-04	}	3.343E-04	G
			103.76	0.000E+00	!	1.813E-04	G
			99.55	0.000E+00	%	2.995E-04	G
ZN-65		5.6606E-05	1115.52	5.661E-05	(	1.470E-04	G
Kr-85		0.0000E+00	513.99	0.000E+00	%	1.054E+00	G
Y-88		0.0000E+00	1836.01	0.000E+00	% P	4.191E-05	G
			898.02	0.000E+00	% P	5.278E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	0.0000E+00	871.10	0.000E+00	%		3.570E-05	G
		702.50	3.007E-05	?		5.969E-05	G
Ag-108M	0.0000E+00	722.95	0.000E+00	}		5.145E-05	G
		614.37	0.000E+00	?		5.471E-05	G
		433.93	1.633E-05	?		4.421E-05	G
AG-110M	0.0000E+00	657.75	0.000E+00	%		4.168E-05	G
		884.67	4.064E-05	&		8.436E-05	G
		937.48	5.450E-05	&		1.283E-04	G
		1384.27	2.338E-04	*		2.541E-04	G
CD-109	0.0000E+00	88.04	0.000E+00	%		1.521E-03	G
SN-113	0.0000E+00	391.71	0.000E+00	&	P	4.468E-05	G
		255.04	0.000E+00	?		1.132E-03	G
SB-125	1.2718E-04	427.95	9.700E-05	&(		1.734E-04	G
		600.77	0.000E+00	%		2.026E-04	G
		636.15	0.000E+00	}		3.489E-04	G
		463.51	0.000E+00	!		5.466E-04	G
		176.29	2.689E-04	&(		7.112E-04	G
TE-131	0.0000E+00	149.72	0.000E+00	%		6.248E-05	G
		452.32	0.000E+00	&		2.810E-04	G
		1146.96	0.000E+00	%		9.437E-04	G
		492.66	0.000E+00	?		5.648E-04	G
TE-132	0.0000E+00	228.16	0.000E+00	%		2.750E-05	G
		116.30	0.000E+00	}		1.883E-03	G
		111.76	2.744E-03	*		2.037E-03	G
J-131	1.6803E-05	364.48	1.680E-05	?(		3.973E-05	G
		636.97	1.662E-04	}		5.383E-04	G
		284.29	0.000E+00	%		5.836E-04	G
CS-134	0.0000E+00	604.66	0.000E+00	%		5.604E-05	G
		795.76	3.786E-05	&		5.504E-05	G
		569.29	0.000E+00	}		4.026E-04	G
		801.84	0.000E+00	%		7.153E-04	G
CS-137	2.5750E-04	661.62	2.575E-04	(		6.085E-05	G
CE-139	0.0000E+00	165.85	0.000E+00	%	P	3.916E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-141	2.7710E-05	145.45	2.771E-05	(	7.461E-05		G
CE-144	0.0000E+00	133.53	0.000E+00	%	2.920E-04		G
		80.12	0.000E+00	&	2.942E-03		G
EU-152	0.0000E+00	121.78	0.000E+00	}	1.117E-04		G
		344.30	0.000E+00	&	1.116E-04		G
		1408.08	1.887E-04	&	1.545E-04		G
		964.00	0.000E+00	&	4.503E-04		G
		1112.07	0.000E+00	%	3.928E-04		G
		778.90	1.526E-04	&	3.147E-04		G
EU-154	0.0000E+00	123.10	0.000E+00	%	9.104E-05		G
		1274.80	8.992E-05	?	2.394E-04		G
		723.30	0.000E+00	}	2.447E-04		G
		1004.80	0.000E+00	%	2.535E-04		G
EU-155	0.0000E+00	86.45	0.000E+00	}	1.800E-04		G
		105.31	0.000E+00	%	1.894E-04		G
TA-182	0.0000E+00	67.75	0.000E+00	&	1.412E-04		G
		1121.28	0.000E+00	%	2.850E-04		G
		1221.42	0.000E+00	%	2.112E-04		G
		1189.05	0.000E+00	%	1.963E-04		G
HG-203	0.0000E+00	279.17	0.000E+00	% P	5.390E-05		G
		72.87	0.000E+00	!	7.525E-04		G
TL-208	3.6319E-04	583.14	3.632E-04	(	6.485E-05		G
		510.72	4.903E-04	+	2.459E-04		G
PB-212	1.2436E-03	238.63	1.244E-03	(	8.509E-05		G
		77.11	0.000E+00	}	3.696E-04		Energy duplication
		74.81	1.667E-03	}	6.141E-04		G
PB-214	8.8769E-04	351.99	8.608E-04	(	1.443E-04		G
		295.22	9.397E-04	(	2.089E-04		G
		77.11	2.048E-03	}	5.521E-04		Energy duplication
		241.92	8.877E-04	}	6.134E-04		G
BI-207	8.3628E-05	569.67	0.000E+00	}	4.085E-05		G
		1063.62	8.363E-05	&(	6.596E-05		G
		74.97	0.000E+00	}	1.772E-04		G
BI-212	9.2161E-04	727.17	7.995E-04	(	5.473E-04		G
		1620.56	3.665E-04	-	1.350E-03		G
		785.42	1.642E-03	&(	2.480E-03		G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-214	8.3686E-04	609.32	8.503E-04	(	1.168E-04		G
		1764.51	8.894E-04	(	2.521E-04		G
		1120.28	7.399E-04	(	4.977E-04		G
RA-224	8.8240E-04	241.00	8.824E-04	}(	1.987E-03		G
RA-226	0.0000E+00	185.99	0.000E+00	}	1.285E-03		G
AC-228	1.1388E-03	911.07	1.139E-03	@(	1.776E-04		G
		968.90	9.004E-04	-	4.327E-04		G
		338.40	8.625E-04	-	4.078E-04		G
TH-227	1.2435E-04	236.00	1.243E-04	(	3.923E-04		G
		256.25	0.000E+00	&	4.602E-04		G
TH-234	2.2144E-03	63.29	2.214E-03	(	2.027E-03		G
		92.80	2.411E-03	}	1.614E-03		G
		92.38	0.000E+00	}	2.287E-03		G
U-235	2.8011E-04	185.72	2.801E-04	}	9.872E-05		G
		143.76	2.727E-04	(	3.521E-04		G
		205.31	2.966E-04	?(	5.054E-04		G
		163.35	0.000E+00	!	8.410E-04		G
NP-237	0.0000E+00	86.49	0.000E+00	}	4.498E-04		G
		95.87	0.000E+00	%	1.569E-03		G
AM-241	9.6578E-05	59.54	9.658E-05	(P	2.863E-04		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
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

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
K-40		1.6822E+01	1.6822E+01	2.6709E+00	2.8350E+00
CR-51	<	2.5350E-01	4.0894E-01		
MN-54	#A	1.7453E-02	1.8209E-02	3.4067E-02	3.4082E-02
MN-56	#	5.2550E-02	>12 Halflives	6.2324E-02	6.2394E-02
FE-59	<	1.2360E-01	1.6580E-01		
CO-57	A	1.4294E-01	1.5013E-01	3.4539E-01	3.4549E-01
CO-58	<	4.1996E-02	5.0639E-02		
CO-60	A	4.6121E-02	4.6439E-02	9.0087E-02	9.0125E-02
Cm-243	A	2.2247E-01	2.2273E-01	2.4044E-01	2.4077E-01
ZN-65	A	5.8537E-02	6.1806E-02	1.4293E-01	1.4297E-01
Kr-85	<	1.0899E+03	1.0900E+03		
Y-88	<	4.3344E-02	4.9079E-02		
NB-94	<	3.6917E-02	3.6917E-02		
Ag-108M	<	5.6581E-02	5.6598E-02		
AG-110M	<	4.3107E-02	4.5453E-02		
CD-109	<	1.5725E+00	1.6191E+00		
SN-113	<	4.6208E-02	5.1844E-02		
SB-125	#A	1.3152E-01	1.3325E-01	2.2207E-01	2.2220E-01
TE-131	<	6.46E-02	>12 Halflives		
TE-132	<	2.8437E-02	1.6833E+00		
J-131	#A	1.7376E-02	9.0258E-02	1.9862E-01	1.9869E-01
CS-134	<	5.7954E-02	5.8983E-02		
CS-137		2.6629E-01	2.6661E-01	9.6079E-02	9.7253E-02
CE-139	<	4.0502E-02	4.4597E-02		
CE-141	A	2.8656E-02	4.3140E-02	1.0454E-01	1.0456E-01
CE-144	<	3.0200E-01	3.1641E-01		
EU-152	<	1.1545E-01	1.1578E-01		
EU-154	<	9.4144E-02	9.4547E-02		
EU-155	<	1.9583E-01	1.9726E-01		
TA-182	<	1.4607E-01	1.6390E-01		
HG-203	<	5.5742E-02	7.4073E-02		
TL-208		3.7558E-01	>12 Halflives	1.0957E-01	1.1161E-01
PB-212		1.2860E+00	>12 Halflives	1.7239E-01	1.8708E-01
PB-214		9.1798E-01	>12 Halflives	1.8570E-01	1.9281E-01
BI-207	#C	8.6482E-02	8.6565E-02	8.7758E-02	8.7894E-02

BI-212		9.5306E-01	>12 Halflives	8.2641E-01	8.2817E-01
BI-214		8.6542E-01	>12 Halflives	2.1355E-01	2.1908E-01
RA-224	#	9.1251E-01	3.4045E+01	5.1921E+04	4.0209E+01
AC-228		1.1777E+00	>12 Halflives	3.8438E-01	3.9010E-01
TH-227	A	1.2859E-01	2.6313E-01	7.4208E-01	7.4223E-01
TH-234		2.2900E+00	3.9677E+00	3.4683E+00	3.4752E+00
U-235	A	2.8967E-01	2.8967E-01	3.2248E-01	3.2288E-01
NP-237	<	1.6228E+00	1.6228E+00		
AM-241	A	9.9874E-02	9.9882E-02	2.6610E-01	2.6616E-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 2023.1 keV) 2.1560825E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 5.6607075E+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_22DEC2004_1715.An1

Sample description
Detector 101 FSS-OOL-04-01-017-F

Spectrum Filename: C:\GammaVision\Spectra\101F_22DEC2004_1715.An1

Acquisition information
Start time: 22-Dec-2004 17:05:50
Live time: 2000
Real time: 2002
Dead time: 0.12 %
Detector ID: 1

Detector system
Det 101- DSPE-633

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

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

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

Library Files
Main analysis library: YAEC_OperatingSpectrumRevA.Lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: wan32 G53W2.06
Start channel: 100 (50.23keV)
Stop channel: 4048 (2023.09keV)
Peak rejection level: 100.000%
Peak search sensitivity: 3
Sample Size: 1.3700E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.3700E+03) =
7.2993E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	best method (based on spectrum).

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

Corrections	Status	Comments
Decay correct to date:	YES	10-Dec-2004 13:28:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

Energy Calibration
Normalized diff: 0.1432

********** 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	
173.78	87.00	351.	178.	0.089	50.12	1.014	PB-214	D
179.63	89.93	297.	96.	0.048	81.84	1.016	PB-214	D
185.37	92.80	349.	120.	0.060	71.78	1.018	TH-234	D
418.40	209.42	143.	114.	0.057	52.48	1.101	AC-228	D
539.68	269.98	88.	64.	0.032	101.02	0.760	AC-228	
600.37	300.31	70.	79.	0.040	84.83	1.049	PB-212	s
926.11	463.11	40.	37.	0.019	92.57	1.708	AC-228	s
1589.99	795.17	18.	34.	0.017	73.27	1.502	AC-228	D

s - Peak fails shape tests.
D - Peak area deconvoluted.

This section based on library: YAEC_OperatingSpectrumRevA.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
AM-241	118.64	59.54	210.	22.	0.011	285.13	0.994D
TH-234	126.14	63.29	322.	65.	0.032	123.21	0.997D
TA-182	135.00	67.72	124.	8.	0.004	631.11	0.500s
HG-203	145.31	72.87	421.	34.	0.017	263.11	1.003D
PB-212	149.19	74.81	357.	266.	0.133	35.26	1.005D
BI-207	149.51	74.97	276.	0.	0.000	0.00	0.754D
PB-214	153.79	77.11	381.	394.	0.197	25.91	1.006D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PB-212	153.79	77.11	530.	0.	0.000	234.19	0.478D
CE-144	159.81	80.12	261.	0.	0.000	0.00	0.545D
EU-155	172.48	86.45	521.	0.	0.000	63871.30	1.013D
NP-237	172.56	86.49	521.	0.	0.000	0.00	1.013D
CD-109	175.66	88.04	474.	23.	0.012	403.11	1.014D
TH-234	184.34	92.38	421.	50.	0.025	180.85	1.018D
TH-234	185.18	92.80	325.	0.	0.000	181.90	0.847D
NP-237	191.32	95.87	276.	38.	0.019	189.83	1.020D
Cm-243	198.69	99.55	263.	28.	0.014	256.59	1.023D
Cm-243	207.11	103.76	247.	16.	0.008	423.72	1.026D
EU-155	210.21	105.31	285.	30.	0.015	241.47	1.027D
TE-132	225.58	112.99	220.	54.	0.027	178.09	1.118s
TE-132	232.20	116.30	282.	0.	0.000	0.00	1.035
Cm-243	234.84	117.62	155.	43.	0.022	168.82	1.026
EU-152	243.16	121.78	187.	0.	0.000	0.00	1.039D
CO-57	243.74	122.07	223.	11.	0.006	500.72	1.039D
EU-154	245.80	123.10	265.	53.	0.027	135.77	1.040D
CE-144	266.67	133.53	259.	14.	0.007	500.75	1.047D
CO-57	272.48	136.43	242.	18.	0.009	365.49	1.049D
U-235	287.14	143.76	157.	10.	0.005	551.48	1.054D
CE-141	290.52	145.45	236.	15.	0.007	449.78	1.055D
TE-131	299.07	149.72	273.	27.	0.013	268.59	1.058D
U-235	326.34	163.35	132.	11.	0.005	452.58	1.068D
CE-139	331.34	165.85	214.	27.	0.014	232.90	1.070D
SB-125	350.81	175.58	141.	26.	0.013	280.27	0.594s
U-235	371.10	185.72	363.	0.	0.000	0.00	1.084A
RA-226	371.64	185.99	255.	134.	0.067	56.81	0.960A
U-235	410.29	205.31	93.	44.	0.022	104.51	1.098D
TE-132	456.79	228.55	124.	47.	0.023	164.85	2.042s
TH-227	471.70	236.00	128.	27.	0.014	185.06	1.120D
PB-212	476.96	238.63	112.	749.	0.374	12.50	1.122D
RA-224	481.70	241.00	136.	106.	0.053	55.01	1.891A
PB-214	483.54	241.92	216.	94.	0.047	9.55	1.124A
SN-113	509.79	255.04	91.	0.	0.000	0.00	0.964D
TH-227	510.75	255.52	120.	44.	0.022	188.46	1.055s
Cm-243	554.93	277.60	79.	49.	0.024	89.05	1.149D
HG-203	558.07	279.17	107.	4.	0.002	471.64	1.150D
J-131	567.00	283.63	33.	0.	0.000	0.00	0.083s
PB-214	590.40	295.33	128.	185.	0.092	38.04	1.091
CR-51	639.70	319.96	18.	22.	0.011	118.88	0.692s
AC-228	676.85	338.53	136.	152.	0.076	46.71	1.075
EU-152	687.50	343.86	26.	0.	0.000	0.00	0.583s
PB-214	703.54	351.87	108.	349.	0.174	22.02	1.170
J-131	726.00	363.10	40.	1.	0.001	2586.50	0.154s
SN-113	783.00	391.58	20.	0.	0.000	0.00	0.000s
SB-125	854.19	427.17	58.	18.	0.009	223.50	0.782s
Ag-108M	867.22	433.67	47.	15.	0.008	218.06	0.984
TE-131	905.00	452.56	36.	2.	0.001	1140.62	0.720s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-125	926.92	463.51	40.	0.	0.000	0.00	1.708D
TE-131	984.40	492.24	33.	3.	0.002	774.79	2.048s
TL-208	1021.38	510.72	52.	91.	0.045	46.34	1.311D
Kr-85	1027.92	513.99	47.	5.	0.003	589.60	1.313D
CS-134	1138.58	569.29	31.	0.	0.000	0.00	1.198D
BI-207	1137.22	568.61	31.	12.	0.006	222.79	1.198
TL-208	1166.31	583.15	56.	235.	0.117	25.98	1.295
SB-125	1201.57	600.77	36.	0.	0.000	0.00	0.600D
CS-134	1209.35	604.66	43.	1.	0.001	1960.57	1.374D
BI-214	1218.68	609.32	33.	234.	0.117	22.21	1.378D
Ag-108M	1228.78	614.37	21.	0.	0.000	5568.14	1.381D
SB-125	1272.36	636.15	12.	0.	0.000	0.00	0.736D
J-131	1274.74	637.34	32.	20.	0.010	162.58	0.812s
AG-110M	1315.58	657.75	31.	8.	0.004	328.33	1.410D
CS-137	1323.33	661.62	39.	176.	0.088	27.09	1.413D
NB-94	1402.77	701.32	38.	14.	0.007	242.44	0.977
Ag-108M	1446.05	722.95	24.	5.	0.003	395.25	1.454D
EU-154	1446.75	723.30	35.	0.	0.000	0.00	1.454D
BI-212	1454.49	727.17	28.	47.	0.023	65.00	1.457D
EU-152	1559.30	779.55	15.	9.	0.005	212.13	0.561s
BI-212	1570.99	785.39	23.	33.	0.016	96.51	0.975s
CS-134	1591.75	795.76	55.	0.	0.000	0.00	1.502D
CS-134	1603.91	801.84	16.	7.	0.003	288.73	1.506D
CO-58	1622.21	810.98	11.	3.	0.002	454.62	0.571s
MN-54	1670.00	834.87	14.	2.	0.001	862.87	0.000s
MN-56	1692.00	845.86	5.	1.	0.001	874.64	0.178s
NB-94	1741.00	870.35	7.	0.	0.000	1014.89	0.437s
AG-110M	1768.75	884.21	11.	4.	0.002	382.43	0.799s
Y-88	1798.12	898.89	31.	18.	0.009	164.85	0.660s
AC-228	1822.48	911.07	25.	135.	0.067	34.53	1.520s
AG-110M	1873.57	936.60	8.	1.	0.001	1135.78	0.656s
EU-152	1928.41	964.00	35.	0.	0.000	0.00	1.756D
AC-228	1937.72	968.65	31.	87.	0.043	45.72	1.897
EU-154	2012.57	1006.06	20.	8.	0.004	295.82	0.513s
BI-207	2128.67	1064.07	7.	1.	0.001	793.73	0.372s
FE-59	2200.00	1099.72	8.	0.	0.000	0.00	0.000s
EU-152	2224.72	1112.07	13.	0.	0.000	0.00	0.974D
ZN-65	2231.62	1115.52	35.	8.	0.004	312.76	1.710D
BI-214	2241.15	1120.28	22.	51.	0.025	57.41	1.713D
TA-182	2243.15	1121.28	68.	0.	0.000	0.00	1.713D
TE-131	2296.00	1147.69	12.	0.	0.000	0.00	0.000s
CO-60	2345.00	1172.17	19.	0.	0.000	0.00	0.000s
TA-182	2376.81	1188.07	16.	14.	0.007	164.43	2.187s
TA-182	2444.67	1221.98	41.	14.	0.007	260.42	0.390s
EU-154	2546.20	1272.71	14.	15.	0.007	151.00	0.427s
FE-59	2579.30	1289.25	15.	15.	0.007	160.35	0.514s
CO-60	2669.37	1334.26	16.	0.	0.000	251.46	0.813s
AG-110M	2771.00	1385.04	2.	1.	0.001	600.00	0.000s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-152	2816.51	1407.78	2.	15.	0.007	91.65	2.410s
K-40	2922.02	1460.50	12.	634.	0.317	12.42	1.632
BI-212	3242.17	1620.47	0.	12.	0.006	86.60	0.874s
BI-214	3530.11	1764.34	2.	38.	0.019	53.69	1.346s
MN-56	3622.00	1810.25	0.	0.	0.000	0.00	0.000s
Y-88	3674.17	1836.31	0.	15.	0.007	77.46	0.625s

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 microCi	Peak Energy keV	Peak Activity microCi	Peak Code	Peak MDA Value microCi	Comments
K-40		2.7234E-02	1460.75	2.723E-02	(	7.946E-04	G
CR-51		2.5260E-04	320.07	2.526E-04	?(	2.581E-04	G
MN-54		0.0000E+00	834.81	0.000E+00	%	5.696E-05	G
MN-56		0.0000E+00	846.60	0.000E+00	%	3.777E-05	G
			1811.20	0.000E+00	?	1.512E-04	G
FE-59		0.0000E+00	1099.22	0.000E+00	?	1.007E-04	G
			1291.56	1.415E-04	&	1.990E-04	G
CO-57		0.0000E+00	122.07	0.000E+00	} P	5.391E-05	G
			136.43	0.000E+00	%	4.574E-04	G
CO-58		0.0000E+00	810.75	0.000E+00	%	4.972E-05	G
CO-60		0.0000E+00	1332.51	0.000E+00	& P	8.956E-05	G
			1173.23	0.000E+00	& P	8.652E-05	G
Cm-243		3.4350E-04	277.60	3.435E-04	(	3.132E-04	G
			117.00	2.546E-04	}	3.596E-04	G
			103.76	0.000E+00	%	2.157E-04	G
			99.55	1.271E-04	-	3.618E-04	G
ZN-65		0.0000E+00	1115.52	0.000E+00	%	2.152E-04	G
Kr-85		0.0000E+00	513.99	0.000E+00	%	1.443E+00	G
Y-88		7.1358E-05	1836.01	8.390E-05	?(P	4.191E-05	G
			898.02	5.810E-05	&(P	9.121E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
NB-94	0.0000E+00	871.10	0.000E+00	%	4.306E-05	G
		702.50	3.368E-05	&	7.562E-05	G
Ag-108M	0.0000E+00	722.95	0.000E+00	}	6.904E-05	G
		614.37	0.000E+00	%	5.596E-05	G
		433.93	2.591E-05		5.837E-05	G
AG-110M	0.0000E+00	657.75	0.000E+00	%	6.880E-05	G
		884.67	0.000E+00	%	7.383E-05	G
		937.48	0.000E+00	&	1.443E-04	G
		1384.27	0.000E+00	%	1.673E-04	G
CD-109	0.0000E+00	88.04	0.000E+00	%	1.922E-03	G
SN-113	0.0000E+00	391.71	0.000E+00	? P	5.062E-05	G
		255.04	0.000E+00	!	2.090E-03	G
SB-125	1.2485E-04	427.95	8.941E-05	&(	1.938E-04	G
		600.77	0.000E+00	&	3.466E-04	G
		636.15	0.000E+00	}	3.649E-04	G
		463.51	0.000E+00	!	5.214E-04	G
		176.29	2.914E-04	&(	6.505E-04	G
TE-131	2.5604E-05	149.72	2.560E-05	(	7.634E-05	G
		452.32	0.000E+00	%	2.657E-04	G
		1146.96	0.000E+00	%	1.437E-03	G
		492.66	0.000E+00	%	1.043E-03	G
TE-132	8.2311E-05	228.16	4.446E-05	*(	5.165E-05	G
		116.30	0.000E+00	}	2.657E-03	G
		111.76	1.893E-03	&(	2.498E-03	G
J-131	0.0000E+00	364.48	0.000E+00	&	5.070E-05	G
		636.97	6.197E-04	}	8.849E-04	G
		284.29	0.000E+00	&	4.916E-04	G
CS-134	0.0000E+00	604.66	0.000E+00	%	7.099E-05	G
		795.76	0.000E+00	!	1.176E-04	G
		569.29	0.000E+00	}	3.652E-04	G
		801.84	2.028E-04		6.719E-04	G
CS-137	4.7433E-04	661.62	4.743E-04	(	8.521E-05	G
CE-139	2.3411E-05	165.85	2.341E-05	(P	6.069E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-141	0.0000E+00	145.45	0.000E+00	%	1.012E-04		G
CE-144	0.0000E+00	133.53	0.000E+00	%	4.628E-04		G
		80.12	0.000E+00	!	3.673E-03		G
EU-152	0.0000E+00	121.78	0.000E+00	}	1.452E-04		G
		344.30	0.000E+00	?	1.187E-04		G
		1408.08	3.144E-04		1.950E-04		G
		964.00	0.000E+00	!	6.633E-04		G
		1112.07	0.000E+00	?	5.199E-04		G
		778.90	1.899E-04	?	4.182E-04		G
EU-154	1.3185E-04	123.10	8.423E-05	(	1.240E-04		G
		1274.80	1.722E-04	&(	2.313E-04		G
		723.30	0.000E+00	}	3.797E-04		G
		1004.80	1.600E-04	&(	4.383E-04		G
EU-155	9.0661E-05	86.45	0.000E+00	}	2.357E-04		G
		105.31	9.066E-05	(	2.424E-04		G
TA-182	0.0000E+00	67.75	0.000E+00	%	1.303E-04		G
		1121.28	0.000E+00	%	4.284E-04		G
		1221.42	1.982E-04	?	4.672E-04		G
		1189.05	3.148E-04	&	5.045E-04		G
HG-203	0.0000E+00	279.17	0.000E+00	% P	6.202E-05		G
		72.87	4.483E-04		1.306E-03		G
TL-208	5.5164E-04	583.14	5.516E-04	(	8.859E-05		G
		510.72	7.162E-04	+	2.886E-04		G
PB-212	1.5071E-03	238.63	1.507E-03	(	1.047E-04		G
		77.11	0.000E+00	}	4.937E-04		Energy duplication
		74.81	2.266E-03	}	7.721E-04		G
PB-214	1.1095E-03	351.99	1.163E-03	(	1.706E-04		G
		295.22	1.006E-03	(	3.023E-04		G
		77.11	2.890E-03	}	6.879E-04		Energy duplication
		241.92	1.109E-03	}	8.358E-04		G
BI-207	0.0000E+00	569.67	2.488E-05	}	5.753E-05		G
		1063.62	0.000E+00	%	6.664E-05		G
		74.97	0.000E+00	}	1.691E-04		G
BI-212	9.8616E-04	727.17	9.862E-04	(	5.770E-04		G
		1620.56	2.199E-03	+	1.350E-03		G
		785.42	4.349E-03	+	3.357E-03		G

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
BI-214	1.1484E-03	609.32	1.072E-03	(	1.356E-04	G
		1764.51	1.289E-03	(	3.362E-04	G
		1120.28	1.234E-03	(	5.955E-04	G
RA-224	2.3784E-03	241.00	2.378E-03	}(	2.216E-03	G
RA-226	2.9715E-03	185.99	2.971E-03	}(	1.710E-03	G
AC-228	1.4859E-03	911.07	1.411E-03	@(	2.742E-04	G
		968.90	1.596E-03	(	5.278E-04	G
		338.40	1.507E-03	(	5.656E-04	G
TH-227	3.5538E-04	236.00	2.093E-04	(	4.252E-04	G
		256.25	5.960E-04	&(	7.282E-04	G
TH-234	2.0072E-03	63.29	2.007E-03	(	2.673E-03	G
		92.80	0.000E+00	}	1.964E-03	Energy duplication
		92.38	1.313E-03	}	2.606E-03	G
U-235	0.0000E+00	185.72	0.000E+00	}	1.231E-04	G
		143.76	0.000E+00	%	3.798E-04	G
		205.31	7.181E-04		7.869E-04	G
		163.35	0.000E+00	%	8.150E-04	G
NP-237	8.6800E-04	86.49	0.000E+00	}	5.891E-04	G
		95.87	8.680E-04	(	1.811E-03	G
AM-241	9.5226E-05	59.54	9.523E-05	(P	3.061E-04	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
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

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
K-40		1.9879E+01	1.9879E+01	2.4690E+00	2.7125E+00
CR-51	#A	1.8438E-01	2.4990E-01	2.9708E-01	2.9741E-01
MN-54	<	4.1576E-02	4.2713E-02		
MN-56	<	2.76E-02	>12 Halflives		
FE-59	<	7.3535E-02	8.8633E-02		
CO-57	<	3.3386E-01	3.4443E-01		
CO-58	<	3.6290E-02	4.0876E-02		
CO-60	<	6.5373E-02	6.5660E-02		
Cm-243		2.5073E-01	2.5091E-01	2.2342E-01	2.2387E-01
ZN-65	<	1.5708E-01	1.6261E-01		
Kr-85	<	1.0532E+03	1.0533E+03		
Y-88	#	5.2086E-02	5.6369E-02	4.4393E-02	4.4507E-02
NB-94	<	3.1430E-02	3.1430E-02		
Ag-108M	<	4.0846E-02	4.0854E-02		
AG-110M	<	5.0221E-02	5.1943E-02		
CD-109	<	1.4027E+00	1.4290E+00		
SN-113	<	3.6952E-02	3.9757E-02		
SB-125	A	9.1133E-02	9.1895E-02	1.6471E-01	1.6479E-01
TE-131	A	1.8689E-02	>12 Halflives	5.0195E-02	5.0206E-02
TE-132	#	6.0081E-02	8.0470E-01	9.7641E-01	9.7747E-01
J-131	<	3.7004E-02	1.0549E-01		
CS-134	<	5.1816E-02	5.2399E-02		
CS-137		3.4623E-01	3.4649E-01	9.3873E-02	9.5893E-02
CE-139	A	1.7088E-02	1.8168E-02	4.2529E-02	4.2542E-02
CE-141	<	7.3889E-02	9.5841E-02		
CE-144	<	3.3783E-01	3.4799E-01		
EU-152	<	8.6645E-02	8.6802E-02		
EU-154		9.6243E-02	9.6504E-02	1.1542E-01	1.1555E-01
EU-155	A	6.6176E-02	6.6484E-02	1.6054E-01	1.6058E-01
TA-182	<	9.5104E-02	1.0233E-01		
HG-203	<	4.5273E-02	5.4244E-02		
TL-208		4.0266E-01	>12 Halflives	1.0462E-01	1.0706E-01
PB-212		1.1001E+00	>12 Halflives	1.3748E-01	1.5088E-01
PB-214		8.0985E-01	>12 Halflives	1.7797E-01	1.8376E-01
BI-207	<	4.8643E-02	4.8672E-02		

BI-212		7.1983E-01	>12 Halflives	4.6789E-01	4.6966E-01
BI-214		8.3823E-01	>12 Halflives	1.8615E-01	1.9208E-01
RA-224	#	1.7360E+00	1.7337E+01	1.1440E+04	9.5869E+00
RA-226	#	2.1689E+00	2.1690E+00	1.5506E+03	1.2382E+00
AC-228		1.0846E+00	>12 Halflives	2.6725E-01	2.7419E-01
TH-227	A	2.5940E-01	4.0898E-01	5.4011E-01	5.4060E-01
TH-234	A	1.4651E+00	2.0780E+00	2.5603E+00	2.5629E+00
U-235	<	2.7723E-01	2.7723E-01		
NP-237	A	6.3358E-01	6.3358E-01	1.2027E+00	1.2032E+00
AM-241	A	6.9508E-02	6.9512E-02	2.0055E-01	2.0059E-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 2023.1 keV) 2.7375286E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 4.4556374E+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_22DEC2004_1825.An1

Sample description
Detector 101 FSS-OOL-04-01-025-F-B

Spectrum Filename: C:\GammaVision\Spectra\101F_22DEC2004_1825.An1

Acquisition information

Start time:	22-Dec-2004 18:17:31
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:	YAEC_OperatingSpectrumRevA.Lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters

Analysis engine:	wan32 G53W2.06
Start channel:	100 (50.23keV)
Stop channel:	4048 (2023.09keV)
Peak rejection level:	100.000%
Peak search sensitivity:	3
Sample Size:	1.2450E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.2450E+03) = 8.0321E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	best method (based on spectrum).

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

Corrections	Status	Comments
Decay correct to date:	YES	06-Dec-2004 11:47:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

Energy Calibration
Normalized diff: 0.1453

********** 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	
168.23	84.37	213.	54.	0.027	120.91	1.012	TA-182	D
173.76	87.13	226.	92.	0.046	76.21	1.014	PB-214	D
179.59	90.05	220.	81.	0.041	84.49	1.016	PB-214	D
256.73	128.56	235.	106.	0.053	110.20	0.762	AC-228	s
417.97	208.89	109.	94.	0.047	56.32	1.101	AC-228	D
540.49	270.38	96.	47.	0.023	146.53	1.184	AC-228	s
601.08	300.67	63.	59.	0.030	102.39	1.012	PB-212	s
655.59	327.91	57.	34.	0.017	111.35	1.312	AC-228	

s - Peak fails shape tests.
D - Peak area deconvoluted.

This section based on library: YAEC_OperatingSpectrumRevA.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
AM-241	118.64	59.54	212.	19.	0.010	322.58	0.994D
TH-234	126.14	63.29	248.	54.	0.027	129.89	0.997D
TA-182	134.09	67.26	138.	40.	0.020	169.20	1.431s
HG-203	145.31	72.87	291.	39.	0.020	190.87	1.003D
PB-212	149.19	74.81	266.	254.	0.127	33.10	1.005D
BI-207	149.51	74.97	520.	0.	0.000	0.00	1.005D
PB-214	153.79	77.11	298.	380.	0.190	24.68	1.006D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PB-212	153.79	77.11	450.	0.	0.000	246.73	0.458D
CE-144	159.81	80.12	228.	0.	0.000	0.00	1.474D
EU-155	172.48	86.45	330.	2.	0.001	3161.94	1.013D
NP-237	172.56	86.49	332.	0.	0.000	0.00	1.013D
CD-109	175.66	88.04	308.	18.	0.009	422.71	1.014D
TH-234	184.34	92.38	369.	0.	0.000	0.00	1.017D
TH-234	185.18	92.80	249.	115.	0.057	64.60	1.018D
NP-237	191.32	95.87	215.	4.	0.002	1481.21	1.020D
Cm-243	198.69	99.55	222.	37.	0.018	180.14	1.023D
Cm-243	207.11	103.76	258.	9.	0.004	770.90	1.026D
EU-155	210.21	105.31	170.	43.	0.022	135.23	1.027D
TE-132	225.51	112.96	258.	52.	0.026	158.01	0.398s
TE-132	232.20	116.30	189.	0.	0.000	0.00	0.542D
Cm-243	235.72	118.06	164.	60.	0.030	142.59	1.080s
EU-152	243.16	121.78	173.	26.	0.013	222.38	1.038D
CO-57	243.74	122.07	229.	0.	0.000	0.00	1.038D
EU-154	245.80	123.10	200.	23.	0.012	267.87	1.039D
CE-144	266.67	133.53	105.	21.	0.011	214.80	1.047D
CO-57	272.48	136.43	174.	23.	0.011	253.59	1.049D
U-235	287.14	143.76	151.	41.	0.020	137.27	1.054D
CE-141	290.52	145.45	165.	20.	0.010	286.88	1.055D
TE-131	299.07	149.72	172.	24.	0.012	234.89	1.058D
U-235	326.34	163.35	117.	35.	0.018	139.50	1.068D
CE-139	331.34	165.85	112.	21.	0.010	225.92	1.070D
SB-125	353.75	177.05	176.	50.	0.025	193.06	1.063s
U-235	371.10	185.72	216.	243.	0.122	5.57	1.084A
RA-226	371.64	185.99	175.	0.	0.000	5612.49	1.036A
U-235	410.29	205.31	141.	19.	0.010	272.88	1.098D
TE-132	454.17	227.24	61.	4.	0.002	841.93	0.422s
TH-227	471.70	236.00	154.	29.	0.014	192.23	1.120D
PB-212	476.96	238.63	79.	629.	0.315	13.37	1.122D
RA-224	481.70	241.00	108.	73.	0.037	69.46	1.516A
PB-214	483.54	241.92	129.	83.	0.041	9.99	1.124A
SN-113	509.79	255.04	70.	0.	0.000	0.00	1.328D
TH-227	511.67	255.98	70.	16.	0.008	341.13	1.552s
Cm-243	554.93	277.60	57.	41.	0.020	92.14	1.149D
HG-203	558.07	279.17	68.	14.	0.007	189.56	1.150D
J-131	566.78	283.52	39.	23.	0.012	174.51	1.047
PB-214	590.40	295.33	108.	165.	0.082	38.80	0.940
CR-51	641.00	320.62	19.	0.	0.000	0.00	0.000s
AC-228	676.58	338.40	95.	131.	0.065	47.75	1.061s
EU-152	688.00	344.11	21.	1.	0.001	1710.26	0.250s
PB-214	703.54	351.87	102.	304.	0.152	24.69	1.285
J-131	730.37	365.28	22.	3.	0.002	629.81	0.664s
SN-113	781.35	390.76	46.	12.	0.006	258.52	0.875
SB-125	853.78	426.96	44.	18.	0.009	182.93	0.552s
Ag-108M	867.10	433.62	39.	13.	0.007	228.97	0.581s
TE-131	899.00	449.56	65.	23.	0.011	205.23	0.155s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-125	926.29	463.20	36.	20.	0.010	149.89	0.607s
TE-131	978.00	489.04	42.	10.	0.005	346.92	0.253s
TL-208	1021.38	510.72	52.	80.	0.040	50.70	1.311D
Kr-85	1027.92	513.99	59.	12.	0.006	287.77	1.313D
CS-134	1138.58	569.29	32.	7.	0.003	361.31	1.350D
BI-207	1139.34	569.67	33.	4.	0.002	599.89	1.351D
TL-208	1166.12	583.06	36.	189.	0.094	27.36	1.043
SB-125	1201.57	600.77	8.	0.	0.000	0.00	0.700D
CS-134	1209.21	604.59	24.	0.	0.000	0.00	1.374
BI-214	1218.34	609.15	11.	248.	0.124	20.32	1.710s
Ag-108M	1228.78	614.37	8.	0.	0.000	0.00	0.334D
SB-125	1272.36	636.15	20.	0.	0.000	0.00	0.000D
J-131	1272.60	636.27	11.	1.	0.000	1326.65	0.700s
AG-110M	1315.58	657.75	20.	5.	0.002	418.27	1.410D
CS-137	1323.33	661.62	24.	178.	0.089	25.25	1.413D
NB-94	1404.13	702.00	20.	20.	0.010	132.72	0.513s
Ag-108M	1446.05	722.95	24.	6.	0.003	343.01	1.454D
EU-154	1446.75	723.30	32.	0.	0.000	0.00	1.454D
BI-212	1454.49	727.17	24.	52.	0.026	57.62	1.457D
EU-152	1557.00	778.40	2.	0.	0.000	618.47	0.154s
BI-212	1571.23	785.51	15.	13.	0.007	163.99	0.916s
CS-134	1591.75	795.76	21.	0.	0.000	0.00	0.916D
CS-134	1604.22	802.00	20.	19.	0.009	140.34	0.498s
CO-58	1623.10	811.43	13.	13.	0.007	160.35	2.460s
MN-54	1669.40	834.57	24.	25.	0.013	118.19	0.974s
MN-56	1692.00	845.86	4.	0.	0.000	0.00	0.083s
NB-94	1741.05	870.37	11.	34.	0.017	78.25	1.162s
AG-110M	1770.00	884.84	4.	0.	0.000	0.00	0.000s
Y-88	1794.93	897.30	14.	13.	0.007	150.53	0.827s
AC-228	1822.44	911.05	22.	94.	0.047	39.90	1.675
AG-110M	1868.85	934.24	11.	31.	0.016	77.89	1.071s
EU-152	1928.41	964.00	22.	26.	0.013	95.30	1.612D
AC-228	1938.21	968.90	23.	57.	0.028	53.93	1.616D
EU-154	2009.79	1004.67	5.	5.	0.002	265.92	0.469s
BI-207	2128.55	1064.01	14.	15.	0.007	157.06	0.715s
FE-59	2198.00	1098.72	5.	0.	0.000	0.00	0.000s
EU-152	2224.72	1112.07	16.	5.	0.002	392.49	1.708D
ZN-65	2231.62	1115.52	22.	0.	0.000	0.00	1.710D
BI-214	2241.15	1120.28	49.	30.	0.015	113.62	1.713D
TA-182	2243.15	1121.28	60.	15.	0.008	228.73	1.713D
TE-131	2292.92	1146.15	20.	14.	0.007	192.77	0.612s
CO-60	2345.00	1172.17	19.	8.	0.004	142.83	1.999s
TA-182	2379.00	1189.16	4.	1.	0.001	830.66	0.000s
TA-182	2443.36	1221.32	9.	8.	0.004	212.33	1.059s
EU-154	2548.17	1273.70	3.	0.	0.000	655.74	0.422s
FE-59	2583.14	1291.17	4.	2.	0.001	474.34	0.456s
CO-60	2663.05	1331.10	9.	10.	0.005	88.99	0.624s
AG-110M	2765.86	1382.48	3.	3.	0.001	382.43	0.389s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-152	2815.90	1407.48	6.	10.	0.005	159.29	0.628s
K-40	2922.05	1460.52	22.	497.	0.248	14.66	1.773
BI-212	3240.50	1619.63	0.	11.	0.005	90.45	0.999s
BI-214	3529.88	1764.22	0.	28.	0.014	56.69	0.824s
MN-56	3622.00	1810.25	0.	0.	0.000	335.41	0.200s
Y-88	3674.33	1836.40	1.	0.	0.000	360.56	0.394s

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 microCi	Peak Energy keV	Peak Activity microCi	Peak Code	Peak MDA Value microCi	Comments
K-40		2.1325E-02	1460.75	2.132E-02	(	1.058E-03	G
CR-51		0.0000E+00	320.07	0.000E+00	?	2.643E-04	G
MN-54		7.0321E-05	834.81	7.032E-05	(	7.184E-05	G
MN-56		0.0000E+00	846.60	0.000E+00	?	3.460E-05	G
			1811.20	0.000E+00	%	1.512E-04	G
FE-59		0.0000E+00	1099.22	0.000E+00	%	8.100E-05	G
			1291.56	0.000E+00	%	1.148E-04	G
CO-57		1.3873E-04	122.07	0.000E+00	} P	5.470E-05	G
			136.43	1.387E-04	$(	3.909E-04	G
CO-58		3.6271E-05	810.75	3.627E-05	(	5.345E-05	G
CO-60		3.6965E-05	1332.51	4.319E-05	&(P	7.007E-05	G
			1173.23	3.074E-05	&(P	8.720E-05	G
Cm-243		2.8731E-04	277.60	2.873E-04	(	2.691E-04	G
			117.00	3.523E-04	}	3.700E-04	G
			103.76	0.000E+00	%	2.202E-04	G
			99.55	1.689E-04	-	3.337E-04	G
ZN-65		0.0000E+00	1115.52	0.000E+00	%	1.756E-04	G
Kr-85		4.9538E-01	513.99	4.954E-01	(	1.605E+00	G
Y-88		0.0000E+00	1836.01	0.000E+00	% P	4.191E-05	G
			898.02	4.267E-05	* P	6.358E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
NB-94	9.8334E-05	871.10	9.833E-05	*(	5.374E-05	G
		702.50	4.931E-05	-	5.602E-05	G
Ag-108M	0.0000E+00	722.95	0.000E+00	}	6.917E-05	G
		614.37	0.000E+00	&	3.797E-05	G
		433.93	2.253E-05		5.354E-05	G
AG-110M	0.0000E+00	657.75	0.000E+00	%	5.649E-05	G
		884.67	0.000E+00	?	4.889E-05	G
		937.48	2.831E-04	&	1.639E-04	G
		1384.27	0.000E+00	&	2.018E-04	G
CD-109	0.0000E+00	88.04	0.000E+00	%	1.559E-03	G
SN-113	2.5254E-05	391.71	2.525E-05	&(P	7.359E-05	G
		255.04	0.000E+00	&	1.848E-03	G
SB-125	2.0652E-04	427.95	9.363E-05	&(	1.693E-04	G
		600.77	0.000E+00	%	1.749E-04	G
		636.15	0.000E+00	}	4.597E-04	G
		463.51	3.213E-04	$(	4.979E-04	G
		176.29	5.547E-04	&(	7.222E-04	G
TE-131	1.1097E-04	149.72	2.344E-05	(	6.102E-05	G
		452.32	1.968E-04	&(	3.505E-04	G
		1146.96	1.011E-03	?(	1.745E-03	G
		492.66	0.000E+00	&	1.172E-03	G
TE-132	0.0000E+00	228.16	0.000E+00	&	3.708E-05	G
		116.30	0.000E+00	}	2.192E-03	G
		111.76	1.795E-03	&	2.696E-03	G
J-131	0.0000E+00	364.48	0.000E+00	&	3.870E-05	G
		636.97	0.000E+00	}	5.561E-04	G
		284.29	3.835E-04	&	5.305E-04	G
CS-134	0.0000E+00	604.66	0.000E+00		5.475E-05	G
		795.76	0.000E+00	&	7.645E-05	G
		569.29	0.000E+00	}	3.723E-04	G
		801.84	5.904E-04	?	7.317E-04	G
CS-137	4.7988E-04	661.62	4.799E-04	(	6.816E-05	G
CE-139	1.7697E-05	165.85	1.770E-05	(P	4.464E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
CE-141	2.6681E-05	145.45	2.668E-05	(	8.538E-05	G
CE-144	1.2633E-04	133.53	1.263E-04	(	3.002E-04	G
		80.12	0.000E+00	!	3.437E-03	G
EU-152	0.0000E+00	121.78	5.685E-05	}	1.398E-04	G
		344.30	0.000E+00	%	1.079E-04	G
		1408.08	2.201E-04	?	3.059E-04	G
		964.00	5.758E-04		5.351E-04	G
		1112.07	0.000E+00	%	5.689E-04	G
		778.90	0.000E+00	%	2.050E-04	G
EU-154	5.1971E-05	123.10	3.638E-05	(	1.084E-04	G
		1274.80	0.000E+00	&	1.185E-04	G
		723.30	0.000E+00	}	3.646E-04	G
		1004.80	8.782E-05	?(	2.535E-04	G
EU-155	1.2933E-04	86.45	0.000E+00	}	1.887E-04	G
		105.31	1.293E-04	(	1.889E-04	G
TA-182	1.2095E-04	67.75	9.646E-05	(	1.366E-04	G
		1121.28	1.586E-04	(	4.034E-04	G
		1221.42	1.099E-04	?(	2.428E-04	G
		1189.05	0.000E+00	%	2.805E-04	G
HG-203	5.3649E-05	279.17	1.701E-05	(P	5.017E-05	G
		72.87	5.202E-04	(	1.092E-03	G
TL-208	4.4429E-04	583.14	4.443E-04	(	7.210E-05	G
		510.72	6.347E-04	+	2.868E-04	G
PB-212	1.2667E-03	238.63	1.267E-03	(	8.866E-05	G
		77.11	0.000E+00	}	4.559E-04	Energy duplication
		74.81	2.162E-03	}	6.698E-04	G
PB-214	9.7420E-04	351.99	1.014E-03	(	1.658E-04	G
		295.22	8.970E-04	(	2.790E-04	G
		77.11	2.788E-03	}	6.107E-04	Energy duplication
		241.92	9.742E-04	}	6.531E-04	G
BI-207	6.7807E-05	569.67	0.000E+00	}	5.933E-05	G
		1063.62	6.781E-05	(	9.107E-05	G
		74.97	0.000E+00	}	2.300E-04	G
BI-212	1.1873E-03	727.17	1.095E-03	(	5.368E-04	G
		1620.56	2.016E-03	+	1.350E-03	G
		785.42	1.731E-03	(	2.763E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-214	1.1347E-03	609.32	1.135E-03	*(	8.252E-05		G
		1764.51	9.578E-04	-	2.521E-04		G
		1120.28	7.236E-04	-	8.564E-04		G
RA-224	1.6481E-03	241.00	1.648E-03	}(	2.000E-03		G
RA-226	0.0000E+00	185.99	0.000E+00	}	1.427E-03		G
AC-228	1.0651E-03	911.07	9.851E-04	(	2.575E-04		G
		968.90	1.039E-03	(	4.643E-04		G
		338.40	1.295E-03	@(	4.779E-04		G
TH-227	2.2007E-04	236.00	2.201E-04	(	4.653E-04		G
		256.25	0.000E+00	%	5.648E-04		G
TH-234	1.6765E-03	63.29	1.677E-03	(	2.355E-03		G
		92.80	2.604E-03	}	1.726E-03		G
		92.38	0.000E+00	}	2.443E-03		G
U-235	3.2760E-04	185.72	3.276E-04	}	9.580E-05		G
		143.76	2.516E-04	$(	3.731E-04		G
		205.31	3.143E-04	$(	9.563E-04		G
		163.35	5.106E-04	$(	7.685E-04		G
NP-237	0.0000E+00	86.49	0.000E+00	}	4.732E-04		G
		95.87	0.000E+00	%	1.606E-03		G
AM-241	0.0000E+00	59.54	0.000E+00	% P	3.072E-04		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
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

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

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***** 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
K-40		1.7128E+01	1.7128E+01	2.5105E+00	2.6906E+00
CR-51	<	2.1232E-01	3.1902E-01		
MN-54	A	5.6483E-02	5.8561E-02	6.9210E-02	6.9290E-02
MN-56	<	2.78E-02	>12 Halflives		
FE-59	<	6.5062E-02	8.3547E-02		
CO-57	A	1.1143E-01	1.1619E-01	2.9463E-01	2.9470E-01
CO-58	A	2.9133E-02	3.4165E-02	5.4784E-02	5.4818E-02
CO-60	A	2.9691E-02	2.9866E-02	4.3458E-02	4.3490E-02
Cm-243		2.3077E-01	2.3099E-01	2.1284E-01	2.1324E-01
ZN-65	<	1.4107E-01	1.4775E-01		
Kr-85	A	3.9790E+02	3.9795E+02	1.1452E+03	1.1454E+03
Y-88	<	3.3666E-02	3.7423E-02		
NB-94		7.8983E-02	7.8983E-02	6.1804E-02	6.1965E-02
Ag-108M	<	3.0500E-02	3.0507E-02		
AG-110M	<	4.5374E-02	4.7469E-02		
CD-109	<	1.2525E+00	1.2840E+00		
SN-113	#A	2.0284E-02	2.2373E-02	6.3721E-02	6.3733E-02
SB-125		1.6588E-01	1.6774E-01	1.7069E-01	1.7096E-01
TE-131	C	8.9133E-02	>12 Halflives	1.0894E-01	1.0906E-01
TE-132	<	2.9787E-02	9.6159E-01		
J-131	<	3.1084E-02	1.2640E-01		
CS-134	<	4.3972E-02	4.4635E-02		
CS-137		3.8544E-01	3.8584E-01	9.7442E-02	9.9851E-02
CE-139	A	1.4214E-02	1.5429E-02	3.5095E-02	3.5106E-02
CE-141	A	2.1431E-02	3.0360E-02	8.7098E-02	8.7114E-02
CE-144	A	1.0147E-01	1.0558E-01	2.2678E-01	2.2686E-01
EU-152	<	8.6676E-02	8.6887E-02		
EU-154	A	4.1744E-02	4.1896E-02	7.9068E-02	7.9102E-02
EU-155	A	1.0388E-01	1.0452E-01	1.4134E-01	1.4146E-01
TA-182	A	9.7152E-02	1.0716E-01	1.2681E-01	1.2695E-01
HG-203	C	4.3091E-02	5.4894E-02	8.8273E-02	8.8328E-02
TL-208		3.5686E-01	>12 Halflives	9.7619E-02	9.9679E-02
PB-212		1.0174E+00	>12 Halflives	1.3605E-01	1.4769E-01
PB-214		7.8249E-01	>12 Halflives	1.7993E-01	1.8528E-01
BI-207	A	5.4463E-02	5.4507E-02	8.5607E-02	8.5663E-02

BI-212		9.5364E-01	>12 Halflives	5.4949E-01	5.5212E-01
BI-214		9.1137E-01	>12 Halflives	1.8517E-01	1.9219E-01
RA-224	#	1.3238E+00	2.8847E+01	2.4478E+04	2.0104E+01
AC-228		8.5548E-01	>12 Halflives	2.3482E-01	2.3975E-01
TH-227	A	1.7676E-01	3.2520E-01	6.2514E-01	6.2541E-01
TH-234	A	1.3466E+00	2.1502E+00	2.7928E+00	2.7954E+00
U-235	A	2.6313E-01	2.6313E-01	2.9453E-01	2.9490E-01
NP-237	<	1.2899E+00	1.2899E+00		
AM-241	<	2.4674E-01	2.4676E-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 2023.1 keV) 4.1972223E+02 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 4.4829886E+02 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_22DEC2004_1900.An1

Sample description
Detector 101 FSS-OOL-04-01-005-F

Spectrum Filename: C:\GammaVision\Spectra\101F_22DEC2004_1900.An1

Acquisition information
Start time: 22-Dec-2004 18:53:24
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: YAEC_OperatingSpectrumRevA.Lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: wan32 G53W2.06
Start channel: 100 (50.23keV)
Stop channel: 4048 (2023.09keV)
Peak rejection level: 100.000%
Peak search sensitivity: 3
Sample Size: 1.1520E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.1520E+03) =
8.6806E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	best method (based on spectrum).

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

Corrections	Status	Comments
Decay correct to date:	YES	03-Dec-2004 11:10:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

Energy Calibration
Normalized diff: 0.1774

********** 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	
174.08	87.18	182.	97.	0.049	66.07	1.014	PB-214	D
179.54	89.91	176.	98.	0.049	64.62	1.016	PB-214	D
257.69	129.04	204.	98.	0.049	115.96	1.063	AC-228	s
325.48	162.96	116.	21.	0.011	224.06	1.068	BA-140	D
418.10	209.26	111.	45.	0.022	109.49	1.101	AC-228	D
540.01	270.14	62.	58.	0.029	75.83	1.674	AC-228	s
600.01	300.11	50.	42.	0.021	85.93	1.165	PB-212	D
925.86	462.97	34.	44.	0.022	72.11	1.278	AC-228	D
1535.19	767.50	16.	24.	0.012	106.07	1.147	J-134	s

s - Peak fails shape tests.
D - Peak area deconvoluted.

This section based on library: YAEC_OperatingSpectrumRevA.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
AM-241	118.64	59.54	162.	5.	0.003	999.98	0.994D
TH-234	126.14	63.29	201.	27.	0.014	227.20	0.997D
TA-182	133.82	67.13	216.	65.	0.032	156.17	0.875s
HG-203	145.31	72.87	183.	0.	0.000	0.00	1.120D
PB-212	149.19	74.81	216.	183.	0.092	40.62	1.005D
BI-207	149.51	74.97	368.	0.	0.000	0.00	0.000D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PB-214	153.79	77.11	239.	302.	0.151	27.77	1.006D
PB-212	153.79	77.11	456.	0.	0.000	6409.76	0.458D
CE-144	159.81	80.12	216.	11.	0.005	580.57	1.009D
EU-155	172.48	86.45	219.	0.	0.000	0.00	1.013D
NP-237	172.56	86.49	209.	10.	0.005	627.94	1.013D
CD-109	175.66	88.04	285.	9.	0.005	769.31	1.014D
TH-234	184.34	92.38	262.	19.	0.010	362.66	1.017D
TH-234	185.18	92.80	210.	75.	0.037	89.26	1.018D
NP-237	191.32	95.87	180.	7.	0.004	774.18	1.020D
Cm-243	198.69	99.55	184.	27.	0.013	222.82	1.023D
Cm-243	207.11	103.76	186.	0.	0.000	0.00	1.026D
EU-155	210.21	105.31	175.	28.	0.014	208.83	1.027D
TE-132	225.29	112.85	105.	45.	0.023	143.76	1.638s
TE-132	232.20	116.30	152.	0.	0.000	0.00	1.035D
Cm-243	231.70	116.05	195.	67.	0.034	157.48	1.449s
EU-152	243.16	121.78	115.	13.	0.006	373.50	1.038D
CO-57	243.74	122.07	156.	0.	0.000	0.00	1.039D
EU-154	245.80	123.10	167.	20.	0.010	279.81	1.039D
CE-144	266.67	133.53	76.	29.	0.014	140.53	1.047D
CO-57	272.48	136.43	136.	30.	0.015	176.04	1.049D
U-235	287.14	143.76	186.	0.	0.000	0.00	1.054D
CE-141	290.52	145.45	155.	0.	0.000	0.00	1.055
TE-131	295.60	147.99	148.	20.	0.010	286.71	0.865s
U-235	326.34	163.35	122.	20.	0.010	242.82	1.068D
CE-139	331.34	165.85	110.	26.	0.013	176.93	1.070D
SB-125	349.40	174.88	91.	15.	0.007	280.71	0.648s
U-235	371.10	185.72	222.	0.	0.000	0.00	1.084A
RA-226	371.64	185.99	130.	86.	0.043	64.62	1.141A
U-235	410.29	205.31	50.	0.	0.000	8970.68	1.098D
TE-132	453.54	226.93	94.	16.	0.008	270.44	0.811
TH-227	471.70	236.00	86.	28.	0.014	152.26	1.120D
PB-212	476.96	238.63	77.	510.	0.255	15.16	1.122D
RA-224	481.70	241.00	148.	36.	0.018	152.02	0.643A
PB-214	483.54	241.92	128.	65.	0.033	9.72	1.124A
SN-113	509.79	255.04	104.	1.	0.000	7786.61	1.133D
TH-227	512.21	256.25	69.	21.	0.010	181.58	1.134D
Cm-243	554.93	277.60	62.	22.	0.011	162.18	1.149D
HG-203	558.07	279.17	75.	3.	0.001	479.30	1.150D
J-131	571.23	285.74	28.	25.	0.013	147.46	0.288s
PB-214	590.19	295.22	56.	152.	0.076	32.09	1.161D
CR-51	638.19	319.21	38.	12.	0.006	235.05	0.724s
AC-228	676.45	338.33	66.	80.	0.040	58.70	0.965
EU-152	688.83	344.52	15.	2.	0.001	742.46	0.429s
PB-214	703.63	351.92	95.	220.	0.110	31.19	1.148
J-131	730.11	365.15	25.	3.	0.002	698.81	0.835
SN-113	782.32	391.24	46.	13.	0.006	248.05	0.499s
SB-125	854.34	427.24	21.	14.	0.007	165.29	1.100
Ag-108M	865.93	433.03	36.	6.	0.003	474.34	0.414s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TE-131	903.73	451.92	39.	3.	0.002	870.52	0.711s
SB-125	926.92	463.51	77.	2.	0.001	1803.95	1.278D
TE-131	980.40	490.24	24.	6.	0.003	406.20	0.748s
TL-208	1021.38	510.72	36.	69.	0.034	51.84	1.311D
Kr-85	1027.92	513.99	41.	6.	0.003	481.31	1.313D
CS-134	1138.58	569.29	34.	3.	0.001	865.58	1.351D
BI-207	1139.34	569.67	33.	7.	0.004	365.97	1.351D
TL-208	1166.01	583.00	40.	146.	0.073	33.51	1.318
SB-125	1201.57	600.77	12.	0.	0.000	0.00	0.657D
CS-134	1209.35	604.66	28.	7.	0.004	330.89	1.374D
BI-214	1218.68	609.32	15.	177.	0.089	24.33	1.378D
Ag-108M	1228.78	614.37	27.	20.	0.010	131.23	1.381D
SB-125	1272.36	636.15	12.	0.	0.000	0.00	0.916D
J-131	1272.50	636.22	4.	0.	0.000	0.00	0.583s
AG-110M	1315.58	657.75	13.	5.	0.002	348.27	1.410D
CS-137	1323.33	661.62	19.	90.	0.045	37.64	1.413D
NB-94	1405.65	702.76	32.	18.	0.009	186.49	0.675s
Ag-108M	1446.05	722.95	17.	0.	0.000	0.00	1.454D
EU-154	1446.75	723.30	6.	11.	0.005	136.83	1.454D
BI-212	1454.49	727.17	13.	41.	0.020	60.09	1.457D
EU-152	1557.96	778.88	13.	9.	0.004	218.32	1.383
BI-212	1572.61	786.20	19.	9.	0.005	233.76	0.958s
CS-134	1591.75	795.76	30.	16.	0.008	159.32	1.502D
CS-134	1603.91	801.84	26.	6.	0.003	351.66	1.506D
CO-58	1620.19	809.98	11.	8.	0.004	234.69	0.922s
MN-54	1666.11	832.92	16.	4.	0.002	450.92	0.495s
MN-56	1695.52	847.62	13.	10.	0.005	201.28	0.586s
NB-94	1737.84	868.77	19.	16.	0.008	182.91	1.537
AG-110M	1771.00	885.34	8.	2.	0.001	681.91	0.000s
Y-88	1795.11	897.39	6.	2.	0.001	348.81	0.503s
AC-228	1822.51	911.08	20.	95.	0.047	39.32	1.376
AG-110M	1877.22	938.42	9.	3.	0.002	458.26	0.770s
EU-152	1928.41	964.00	27.	18.	0.009	138.31	1.612D
AC-228	1938.21	968.90	20.	48.	0.024	58.12	1.616D
EU-154	2011.00	1005.27	5.	1.	0.000	927.36	0.000s
BI-207	2127.67	1063.57	5.	0.	0.000	854.40	0.394s
FE-59	2199.53	1099.48	11.	22.	0.011	105.30	0.601s
EU-152	2224.72	1112.07	19.	5.	0.002	394.32	1.708D
ZN-65	2231.62	1115.52	26.	0.	0.000	0.00	1.710D
BI-214	2241.15	1120.28	17.	30.	0.015	79.61	1.713D
TA-182	2243.15	1121.28	23.	0.	0.000	0.00	0.458D
TE-131	2295.00	1147.19	1.	0.	0.000	0.00	0.000s
CO-60	2345.90	1172.62	17.	5.	0.002	152.67	1.216
TA-182	2377.56	1188.44	4.	0.	0.000	719.37	0.636s
TA-182	2444.58	1221.94	14.	6.	0.003	301.39	0.642s
EU-154	2550.49	1274.86	8.	17.	0.009	120.12	0.600s
FE-59	2582.50	1290.85	2.	0.	0.000	0.00	0.583s
CO-60	2663.62	1331.39	10.	2.	0.001	156.12	0.661s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AG-110M	2768.33	1383.71	1.	0.	0.000	360.56	0.394s
EU-152	2815.98	1407.52	2.	10.	0.005	107.85	0.603s
K-40	2921.81	1460.40	11.	374.	0.187	16.40	1.873
BI-212	3242.37	1620.57	2.	8.	0.004	134.28	1.401s
BI-214	3529.38	1763.97	0.	32.	0.016	53.03	0.999s
MN-56	3622.00	1810.25	0.	2.	0.001	212.13	0.500s
Y-88	3674.67	1836.56	1.	0.	0.000	360.56	0.394s

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 microCi	Peak Energy keV	Peak Activity microCi	Peak Code	Peak MDA Value microCi	Comments
K-40		1.6038E-02	1460.75	1.604E-02	(	7.897E-04	G
CR-51		1.4352E-04	320.07	1.435E-04	&(	3.631E-04	G
MN-54		0.0000E+00	834.81	0.000E+00	&	6.087E-05	G
MN-56		3.1783E-05	846.60	2.924E-05	&(	5.581E-05	G
			1811.20	4.103E-05	?(	1.512E-04	G
FE-59		1.4159E-04	1099.22	1.416E-04	@(	1.137E-04	G
			1291.56	0.000E+00	?	8.874E-05	G
CO-57		1.8037E-04	122.07	0.000E+00	} P	4.551E-05	G
			136.43	1.804E-04	$(	3.477E-04	G
CO-58		2.2038E-05	810.75	2.204E-05	&(	5.004E-05	G
CO-60		0.0000E+00	1332.51	0.000E+00	& P	7.538E-05	G
			1173.23	0.000E+00	% P	8.409E-05	G
Cm-243		1.4067E-04	277.60	1.580E-04	(	2.782E-04	G
			117.00	3.967E-04	}	4.014E-04	G
			103.76	0.000E+00	!	1.881E-04	G
			99.55	1.237E-04	(	3.048E-04	G
ZN-65		0.0000E+00	1115.52	0.000E+00	%	1.892E-04	G
Kr-85		0.0000E+00	513.99	0.000E+00	%	1.358E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
Y-88	0.0000E+00	1836.01	0.000E+00	% P	4.191E-05	G
		898.02	0.000E+00	% P	4.448E-05	G
NB-94	4.5618E-05	871.10	4.673E-05	&(	6.724E-05	G
		702.50	4.450E-05	*(	7.042E-05	G
Ag-108M	4.6295E-05	722.95	0.000E+00	}	5.983E-05	G
		614.37	4.629E-05	(	6.357E-05	G
		433.93	0.000E+00	&	5.182E-05	G
AG-110M	0.0000E+00	657.75	0.000E+00	%	4.691E-05	G
		884.67	0.000E+00	%	6.458E-05	G
		937.48	0.000E+00	&	1.516E-04	G
		1384.27	0.000E+00	%	1.326E-04	G
CD-109	0.0000E+00	88.04	0.000E+00	%	1.501E-03	G
SN-113	2.7394E-05	391.71	2.739E-05	@(P	7.359E-05	G
		255.04	0.000E+00	%	2.231E-03	G
SB-125	8.7919E-05	427.95	7.086E-05	&(	1.218E-04	G
		600.77	0.000E+00	&	2.131E-04	G
		636.15	0.000E+00	}	3.694E-04	G
		463.51	0.000E+00	%	7.060E-04	G
		176.29	1.681E-04	&(	5.285E-04	G
TE-131	1.9148E-05	149.72	1.915E-05	&(	5.687E-05	G
		452.32	0.000E+00	%	2.751E-04	G
		1146.96	0.000E+00	?	5.522E-04	G
		492.66	0.000E+00	&	9.078E-04	G
TE-132	4.7295E-05	228.16	1.561E-05	&(	4.541E-05	G
		116.30	0.000E+00	}	1.975E-03	G
		111.76	1.563E-03	&(	1.753E-03	G
J-131	0.0000E+00	364.48	0.000E+00	&	4.097E-05	G
		636.97	0.000E+00	}	3.636E-04	G
		284.29	4.169E-04	&	4.564E-04	G
CS-134	0.0000E+00	604.66	0.000E+00	%	5.849E-05	G
		795.76	5.166E-05		8.856E-05	G
		569.29	0.000E+00	}	3.831E-04	G
		801.84	0.000E+00	%	8.158E-04	G
CS-137	2.4243E-04	661.62	2.424E-04	(	6.173E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-139	2.2642E-05	165.85	2.264E-05	(P	4.412E-05		G
CE-141	0.0000E+00	145.45	0.000E+00			8.278E-05	G
CE-144	1.7113E-04	133.53	1.711E-04	(		2.584E-04	G
		80.12	0.000E+00	%		3.353E-03	G
EU-152	0.0000E+00	121.78	0.000E+00	}		1.153E-04	G
		344.30	0.000E+00	%		9.308E-05	G
		1408.08	2.201E-04			1.764E-04	G
		964.00	4.022E-04			5.863E-04	G
		1112.07	0.000E+00	%		6.136E-04	G
		778.90	1.763E-04	?		4.013E-04	G
EU-154	1.0817E-04	123.10	3.185E-05	(		9.934E-05	G
		1274.80	1.951E-04	?(		1.824E-04	G
		723.30	1.330E-04	}		1.818E-04	G
		1004.80	0.000E+00	%		2.535E-04	G
EU-155	8.3245E-05	86.45	0.000E+00	}		1.549E-04	G
		105.31	8.325E-05	$(		1.918E-04	G
TA-182	1.5481E-04	67.75	1.548E-04	&(		1.696E-04	G
		1121.28	0.000E+00	&		2.609E-04	G
		1221.42	0.000E+00	%		2.887E-04	G
		1189.05	0.000E+00	%		2.664E-04	G
HG-203	0.0000E+00	279.17	0.000E+00	% P		5.266E-05	G
		72.87	0.000E+00	&		8.734E-04	G
TL-208	3.4321E-04	583.14	3.432E-04	(		7.565E-05	G
		510.72	5.442E-04	+		2.434E-04	G
PB-212	1.0260E-03	238.63	1.026E-03	(		8.758E-05	G
		77.11	0.000E+00	}		4.588E-04	Energy duplication
		74.81	1.558E-03	}		6.058E-04	G
PB-214	7.6479E-04	351.99	7.324E-04	(		1.607E-04	G
		295.22	8.273E-04	(		2.047E-04	G
		77.11	2.215E-03	}		5.490E-04	Energy duplication
		241.92	7.648E-04	}		6.523E-04	G
BI-207	0.0000E+00	569.67	0.000E+00	}		5.947E-05	G
		1063.62	0.000E+00	%		5.776E-05	G
		74.97	0.000E+00	}		1.942E-04	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-212	9.1587E-04	727.17	8.605E-04	(	4.119E-04		G
		1620.56	1.496E-03	+	1.653E-03		G
		785.42	1.243E-03	&(	3.041E-03		G
BI-214	7.8971E-04	609.32	8.094E-04	(	9.356E-05		G
		1764.51	1.095E-03	+	2.521E-04		G
		1120.28	7.293E-04	(	5.292E-04		G
RA-224	8.0772E-04	241.00	8.077E-04	}(	1.854E-03		G
RA-226	1.9156E-03	185.99	1.916E-03	}(	1.238E-03		G
AC-228	9.2187E-04	911.07	9.956E-04	(	2.468E-04		G
		968.90	8.880E-04	(	4.296E-04		G
		338.40	7.931E-04	(	4.022E-04		G
TH-227	2.3981E-04	236.00	2.140E-04	(	3.528E-04		G
		256.25	2.823E-04	(	5.616E-04		G
TH-234	8.4626E-04	63.29	8.463E-04	(	2.127E-03		G
		92.80	1.694E-03	}	1.591E-03		G
		92.38	0.000E+00	}	2.069E-03		G
U-235	0.0000E+00	185.72	0.000E+00	}	9.707E-05		G
		143.76	0.000E+00	!	4.116E-04		G
		205.31	0.000E+00	%	5.858E-04		G
		163.35	2.908E-04	$	7.848E-04		G
NP-237	0.0000E+00	86.49	0.000E+00	}	3.786E-04		G
		95.87	0.000E+00	%	1.474E-03		G
AM-241	0.0000E+00	59.54	0.000E+00	%	P 2.701E-04		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
K-40		1.3922E+01	1.3922E+01	2.2828E+00	2.4145E+00
CR-51	A	1.2459E-01	2.0204E-01	4.7490E-01	4.7504E-01
MN-54	<	5.2836E-02	5.5152E-02		
MN-56	A	2.7589E-02	>12 Halflives	4.0339E-02	4.0369E-02
FE-59	#	1.2291E-01	1.6540E-01	1.7416E-01	1.7441E-01
CO-57	A	1.5657E-01	1.6453E-01	2.8964E-01	2.8978E-01
CO-58	#A	1.9130E-02	2.3115E-02	5.4248E-02	5.4264E-02
CO-60	<	6.5430E-02	6.5887E-02		
Cm-243	A	1.2211E-01	1.2225E-01	1.6845E-01	1.6859E-01
ZN-65	<	1.6428E-01	1.7355E-01		
Kr-85	<	1.1790E+03	1.1792E+03		
Y-88	<	3.6384E-02	4.1254E-02		
NB-94	A	3.9599E-02	3.9599E-02	5.1719E-02	5.1767E-02
Ag-108M	A	4.0187E-02	4.0198E-02	5.2753E-02	5.2801E-02
AG-110M	<	4.0721E-02	4.2963E-02		
CD-109	<	1.3026E+00	1.3417E+00		
SN-113	#A	2.3780E-02	2.6714E-02	7.2478E-02	7.2494E-02
SB-125	A	7.6319E-02	7.7336E-02	1.2597E-01	1.2604E-01
TE-131	#A	1.6621E-02	>12 Halflives	4.7654E-02	4.7663E-02
TE-132	C	4.1055E-02	2.5424E+00	3.6549E+00	3.6577E+00
J-131	<	3.5567E-02	1.8814E-01		
CS-134	<	5.0773E-02	5.1684E-02		
CS-137		2.1044E-01	2.1070E-01	7.9299E-02	8.0188E-02
CE-139	A	1.9654E-02	2.1665E-02	3.8534E-02	3.8553E-02
CE-141	<	7.1856E-02	1.0867E-01		
CE-144	A	1.4855E-01	1.5572E-01	2.1883E-01	2.1900E-01
EU-152	<	8.0802E-02	8.1035E-02		
EU-154	C	9.3896E-02	9.4302E-02	1.1328E-01	1.1340E-01
EU-155	A	7.2262E-02	7.2798E-02	1.5202E-01	1.5208E-01
TA-182	#A	1.3438E-01	1.5098E-01	2.3579E-01	2.3594E-01

HG-203	<	4.5713E-02	6.0938E-02

TL-208		2.9792E-01	>12 Halflives	9.9842E-02	1.0125E-01
PB-212		8.9060E-01	>12 Halflives	1.3498E-01	1.4405E-01
PB-214		6.6388E-01	>12 Halflives	1.4853E-01	1.5320E-01
BI-207	<	5.0136E-02	5.0184E-02		
BI-212		7.9503E-01	>12 Halflives	4.7771E-01	4.7982E-01
BI-214		6.8551E-01	>12 Halflives	1.6676E-01	1.7119E-01
RA-224	#	7.0114E-01	2.7227E+01	5.5279E+04	4.1418E+01
RA-226	#	1.6629E+00	1.6629E+00	1.3166E+03	1.0787E+00
AC-228		8.0023E-01	>12 Halflives	2.4403E-01	2.4818E-01
TH-227	A	2.0817E-01	4.2936E-01	5.0874E-01	5.0932E-01
TH-234	A	7.3460E-01	1.2806E+00	2.9094E+00	2.9103E+00
U-235	<	3.5733E-01	3.5733E-01		
NP-237	<	1.2792E+00	1.2792E+00		
AM-241	<	2.3443E-01	2.3445E-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 2023.1 keV) 1.8674351E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 4.8631668E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

Yankee Chemistry Spectrum name: 101F_23DEC2004_1120.An1

Sample description
Detector 101 FSS-OOL-04-01-003-F

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_23DEC2004_1120.An1

Acquisition information
Start time: 23-Dec-2004 11:13:29
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: 1.4580E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4580E+03) =
6.8587E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_23DEC2004_1120.An1

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	06-Dec-2004 11:51:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2094

***** 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	183.	16.35	1.00	1.651E-02				
74.69	183.	16.35	1.00	1.651E-02	74.81	9.600	1.067E+00	PB212
77.07	308.	9.76	1.01	1.720E-02				
77.07	308.	9.76	1.01	1.720E-02	77.11	10.700	1.553E+00	PB214
					77.11	17.500	9.493E-01	PB212
84.39	72.	34.07	0.75	1.877E-02				
86.68	67.	38.29	1.01	1.915E-02	86.45	32.740	9.976E-02	EU155
89.62	76.	30.92	1.02	1.955E-02	88.04	3.790	9.820E-01	CD109
93.37	111.	23.44	1.02	1.996E-02	92.38	2.570	2.014E+00	TH234
					92.80	3.000	1.721E+00	TH234
128.78	70.	38.94	1.33	2.110E-02				
186.17	108.	24.97	0.97	1.857E-02	185.99	3.280	1.635E+00	RA226
238.67	566.	4.97	1.12	1.558E-02				
238.67	566.	4.97	1.12	1.558E-02	238.63	43.100	7.808E-01	PB212
					241.92	7.470	4.556E+00	PB214
242.21	101.	19.68	1.12	1.539E-02				
294.85	189.	12.98	1.20	1.294E-02				
294.85	189.	12.98	1.20	1.294E-02	295.22	19.200	7.062E-01	PB214
300.44	51.	34.38	1.49	1.271E-02				
329.16	50.	35.24	1.34	1.166E-02				
338.54	122.	20.03	1.05	1.135E-02	338.40	12.010	8.268E-01	AC228
351.90	296.	7.86	1.18	1.093E-02				
351.90	296.	7.86	1.18	1.093E-02	351.99	37.100	6.758E-01	PB214
462.87	35.	32.60	1.50	8.342E-03	463.51	10.000	3.945E-01	SB125
510.52	109.	16.62	1.46	7.593E-03	510.72	22.500	5.926E-01	TL208
582.99	175.	11.92	1.09	6.686E-03	583.14	86.000	2.825E-01	TL208

609.09	234.	8.94	1.53	6.415E-03	609.32	46.090	7.338E-01	BI214
661.08	86.	23.08	1.27	5.942E-03	661.62	84.620	1.583E-01	CS137
727.14	42.	26.42	1.50	5.443E-03	727.17	11.800	5.989E-01	BI212
910.84	122.	13.07	1.77	4.447E-03	911.07	29.000	8.740E-01	AC228
968.65	106.	13.24	1.49	4.213E-03	968.90	17.460	1.333E+00	AC228
1119.65	61.	24.39	1.04	3.711E-03	1120.28	15.040	1.010E+00	BI214
1460.21	513.	4.53	1.87	2.943E-03	1460.75	10.700	1.511E+01	K40
1763.86	38.	18.61	0.72	2.481E-03	1764.51	15.920	8.916E-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	
148.94	74.72	355.	183.	0.091	49.05	1.005	BI-207	D
153.71	77.10	299.	308.	0.154	29.28	1.006	PB-214	D
172.94	86.80	294.	67.	0.033	114.86	1.013	BI-207	lD
178.83	89.74	235.	76.	0.038	92.75	1.015	PB-214	lD
484.12	242.15	148.	101.	0.051	59.04	1.124	PB-214	lD
600.63	300.44	108.	51.	0.026	95.71	1.491	PB-212	s
658.09	329.16	106.	50.	0.025	105.73	1.339	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	148.98	74.71	766.	181.	0.090	68.74	1.499
PB-214	153.79	77.11	760.	226.	0.113	55.57	1.499D
PB-212	153.79	77.11	760.	226.	0.113	55.57	1.499D
TH-234	185.48	92.95	667.	145.	0.072	79.75	1.499s
TH-234	185.48	92.95	626.	152.	0.076	73.91	1.499s
RA-226	371.92	186.13	356.	84.	0.042	100.22	1.499s
PB-212	477.11	238.70	319.	417.	0.208	23.40	1.499
RA-224	483.16	241.73	397.	89.	0.044	100.27	1.499s
PB-214	590.16	295.21	176.	147.	0.073	45.60	1.499s
AC-228	676.87	338.54	147.	122.	0.061	60.09	1.053
PB-214	703.65	351.93	90.	268.	0.134	23.69	1.499
SB-125	925.64	462.87	48.	35.	0.018	97.80	1.499s
TL-208	1020.98	510.52	65.	109.	0.055	49.87	1.459s
TL-208	1165.99	582.99	77.	175.	0.088	35.77	1.094
BI-214	1218.21	609.09	68.	234.	0.117	26.83	1.533
CS-137	1322.24	661.08	78.	86.	0.043	69.23	1.270
BI-212	1454.43	727.14	32.	42.	0.021	79.27	1.498s
AC-228	1822.04	910.84	36.	122.	0.061	39.21	1.769
AC-228	1937.71	968.65	23.	106.	0.053	39.73	1.489
BI-214	2239.89	1119.65	44.	61.	0.030	73.17	1.039s
K-40	2921.43	1460.21	9.	513.	0.257	13.60	1.872
BI-214	3529.15	1763.86	3.	38.	0.019	55.82	0.724s

s - Peak fails shape tests.
D - Peak area deconvoluted.

A Derived peak area.

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

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm		COMMENTS
BE-7		2.7019E-01						
			477.56	2.702E-01	%(	5.072E-01	1.55E-01	G
K-40		1.5108E+01						
			1460.75	1.511E+01	(	4.867E-01	6.85E-01	G
MN-54		2.6172E-02						
			834.81	2.617E-02	%(	6.440E-02	1.93E-02	G
CO-57		-7.0587E-04						
			122.07	-7.059E-04	%(P	5.636E-02	1.66E-02	G K
			136.43	-2.535E-02	%	4.645E-01	1.38E-01	G
CO-60		1.5770E-02						
			1332.51	1.577E-02	%(P	5.838E-02	1.50E-02	G K
			1173.23	3.667E-02	% P	8.111E-02	2.35E-02	G K
Sr-85		-2.0603E-02						
			514.00	-2.060E-02	%(	7.769E-02	2.30E-02	G
Kr-85		-4.0560E+02						
			513.99	-4.056E+02	%(	1.498E+03	4.44E+02	G
Y-88		-1.0744E-03						
			1836.01	-1.074E-03	%(P	7.304E-02	1.83E-02	G K
			898.02	1.007E-03	& P	6.776E-02	1.85E-02	G
NB-94		4.1994E-03						
			871.10	4.199E-03	&(	4.465E-02	1.23E-02	G K
			702.50	0.000E+00	%	6.494E-02	1.84E-02	G K
Ag-108M		5.5805E-03						
			722.95	5.580E-03	%(	7.270E-02	2.08E-02	G K
			614.37	-1.222E-02	%	6.342E-02	1.85E-02	G
			433.93	-6.588E-03	%	4.618E-02	1.34E-02	G
CD-109		3.1410E-01						
			88.04	3.141E-01	%(	1.640E+00	4.91E-01	G
SN-113		-5.4124E-03						
			391.71	-5.412E-03	&(P	8.330E-02	2.39E-02	G K
			255.04	1.134E+00	%	2.152E+00	6.55E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.0241E-01						
		427.95	3.738E-03	&(	1.675E-01	4.81E-02	G K
		600.77	7.850E-02	%	2.543E-01	7.50E-02	G
		636.15	1.329E-01	%	4.123E-01	1.22E-01	G
		463.51	3.945E-01	*(	3.930E-01	1.29E-01	G
		176.29	-4.693E-04	&	7.427E-01	2.19E-01	G
I-131	-8.7551E-03						
		364.48	-8.755E-03	%(	1.924E-01	5.49E-02	G K
		636.97	-3.651E-01	%	3.068E+00	8.76E-01	G
		284.29	1.080E-01	&	3.396E+00	9.93E-01	G
CS-134	-2.1454E-02						
		604.66	-2.145E-02	%(	6.912E-02	2.05E-02	G K
		795.76	2.344E-03	%	5.085E-02	1.38E-02	G
		569.29	4.701E-02	%	2.777E-01	7.96E-02	G
		801.84	8.052E-02	&	5.801E-01	1.64E-01	G
CS-137	1.5826E-01						
		661.62	1.583E-01	(	8.115E-02	3.65E-02	G
CE-139	-2.6609E-03						
		165.85	-2.661E-03	&(P	6.200E-02	1.83E-02	G
EU-152	-2.6376E-02						
		121.78	-2.638E-02	&(	1.364E-01	4.06E-02	G K
		344.30	-6.819E-02	%	1.763E-01	5.30E-02	G
		1408.08	4.641E-02	%	3.039E-01	8.44E-02	G
		964.00	1.360E-01	&	5.052E-01	1.48E-01	G
		1112.07	-9.232E-02	&	5.738E-01	1.64E-01	G
		778.90	5.017E-02	%	3.420E-01	9.60E-02	G
EU-154	-1.7397E-02						
		123.10	-1.740E-02	%(	1.165E-01	3.47E-02	G K
		1274.80	-6.594E-03	&	1.583E-01	4.22E-02	G
		723.30	9.191E-03	%	4.904E-01	1.42E-01	G
		1004.80	-1.870E-03	&	3.877E-01	1.07E-01	G
EU-155	1.3274E-01						
		86.45	1.327E-01	%(	1.900E-01	5.81E-02	G K
		105.31	9.077E-02	%	2.340E-01	7.06E-02	G
HG-203	-1.5601E-02						
		279.17	-1.560E-02	%(P	7.917E-02	2.31E-02	G K
		72.87	-4.194E-01	%	1.804E+00	5.42E-01	G
		70.83	-1.607E-01	%	2.547E+00	7.57E-01	G
		82.50	-1.196E+00	%	3.399E+00	1.02E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.8247E-01						
		583.14	2.825E-01	(	7.021E-02	3.37E-02	G
		510.72	5.926E-01	+	2.183E-01	9.85E-02	G
PB-212	6.0965E-01						
		238.63	5.752E-01	(	1.187E-01	4.49E-02	G K
							Energy duplication
		77.11	6.944E-01	(	4.039E-01	1.29E-01	G
		74.81	1.055E+00	&	7.688E-01	2.42E-01	G
PB-214	5.9125E-01						
		351.99	6.132E-01	(	1.073E-01	4.84E-02	G K
		295.22	5.489E-01	@(	2.410E-01	8.34E-02	G
							Energy duplication
		77.11	1.136E+00	+	6.606E-01	2.10E-01	G
		241.92	-1.686E-03	%	7.543E-01	2.22E-01	G
BI-212	5.9888E-01						
		727.17	5.989E-01	*(	4.165E-01	1.58E-01	G K
		1620.56	2.648E-01	&	1.931E+00	5.16E-01	G
		785.42	9.630E-01	%	2.796E+00	8.28E-01	G
BI-214	7.7431E-01						
		609.32	7.338E-01	(	1.290E-01	6.56E-02	G K
		1764.51	8.916E-01	(	2.530E-01	1.66E-01	G
		1120.28	1.010E+00	+	5.595E-01	2.46E-01	G
RA-224	1.3671E+00						
		241.00	1.367E+00	&(	1.470E+00	4.57E-01	G
RA-226	1.2848E+00						
		185.99	1.285E+00	*(	1.378E+00	4.29E-01	G
AC-228	8.6021E-01						
		911.07	8.740E-01	(	2.216E-01	1.14E-01	G K
		968.90	1.333E+00	+	3.170E-01	1.77E-01	G
		338.40	8.268E-01	(	4.031E-01	1.66E-01	G
TH-227	-2.4657E-01						
		236.00	-2.466E-01	%(	5.083E-01	1.54E-01	G K
		256.25	-9.890E-03	&	6.957E-01	2.04E-01	G
PA-234	-5.6203E-02						
		98.44	-5.620E-02	%(	1.974E-01	5.93E-02	G K
		946.00	1.104E-05	&	3.086E-01	8.48E-02	G
		131.28	-4.439E-02	%	2.488E-01	7.44E-02	G
		94.67	-9.511E-03	%	3.767E-01	1.12E-01	G
		883.24	1.347E-03	%	4.093E-01	1.10E-01	G
		926.70	8.496E-02	%	4.625E-01	1.31E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 5.880E-02 %   4.417E-01 1.26E-01 G

TH-234       2.0614E+00
                           63.29 1.457E+00 %(  2.486E+00 7.58E-01 G K
                           92.80 2.362E+00 @(  1.852E+00 5.82E-01 G
                           92.38 2.628E+00 &(  2.236E+00 6.99E-01 G

AM-241      -8.9975E-03
                           59.54-8.998E-03 %(P 3.382E-01 1.00E-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	2.1676E-01	2.7019E-01	4.6530E-01	4.6555E-01	4.069E-01
K-40		1.5108E+01	1.5108E+01	2.0549E+00	2.2251E+00	
MN-54	#A	2.5204E-02	2.6172E-02	5.7920E-02	5.7939E-02	6.202E-02
CO-57	#B	-6.7577E-04	-7.0587E-04	1.3179E-01	1.3179E-01	5.395E-02
CO-60	#B	1.5674E-02	1.5770E-02	4.5021E-02	4.5029E-02	5.802E-02

Sr-85	#A	-1.7184E-02	-2.0603E-02	6.9090E-02	6.9100E-02	6.480E-02
Kr-85	#A	-4.0555E+02	-4.0560E+02	1.3327E+03	1.3329E+03	1.497E+03
Y-88	#B	-9.6215E-04	-1.0744E-03	2.7127E-02	2.7127E-02	6.540E-02
NB-94	#B	4.1994E-03	4.1994E-03	3.6754E-02	3.6755E-02	4.465E-02
Ag-108M	#B	5.5791E-03	5.5805E-03	6.2330E-02	6.2331E-02	7.268E-02
CD-109	#A	3.0605E-01	3.1410E-01	1.4735E+00	1.4736E+00	1.598E+00
SN-113	#B	-4.8865E-03	-5.4124E-03	1.5271E-01	1.5271E-01	7.521E-02
SB-125	#B	1.0123E-01	1.0241E-01	1.0016E-01	1.0033E-01	1.656E-01
I-131	#B	-2.0264E-03	-8.7551E-03	1.6481E-01	1.6481E-01	4.454E-02
CS-134	#B	-2.1121E-02	-2.1454E-02	6.1634E-02	6.1646E-02	6.805E-02
CS-137		1.5809E-01	1.5826E-01	1.0956E-01	1.0992E-01	
CE-139	#A	-2.4427E-03	-2.6609E-03	5.8823E-02	5.8823E-02	5.691E-02
EU-152	#B	-2.6309E-02	-2.6376E-02	1.2193E-01	1.2193E-01	1.360E-01
EU-154	#B	-1.7331E-02	-1.7397E-02	1.0418E-01	1.0419E-01	1.160E-01
EU-155	#B	1.3188E-01	1.3274E-01	1.7445E-01	1.7460E-01	1.887E-01
HG-203	#B	-1.2119E-02	-1.5601E-02	1.4467E-01	1.4468E-01	6.150E-02
TL-208		2.8247E-01	2.8247E-01	1.0103E-01	1.0229E-01	
PB-212	#	6.0965E-01	6.0965E-01	1.4263E-01	1.4673E-01	1.187E-01
PB-214	#	5.9125E-01	5.9125E-01	1.4006E-01	1.4399E-01	1.073E-01
BI-212	#	5.9888E-01	5.9888E-01	4.7474E-01	4.7595E-01	
BI-214		7.7431E-01	7.7431E-01	2.0776E-01	2.1232E-01	
RA-224	#A	1.3671E+00	1.3671E+00	1.3708E+00	1.3730E+00	1.470E+00
RA-226	#A	1.2848E+00	1.2848E+00	1.2876E+00	1.2896E+00	1.378E+00
AC-228		8.6021E-01	8.6021E-01	3.0862E-01	3.1243E-01	
TH-227	#B	-2.4657E-01	-2.4657E-01	4.6262E-01	4.6283E-01	5.083E-01
PA-234	#B	-5.6203E-02	-5.6203E-02	1.7784E-01	1.7787E-01	1.974E-01
TH-234	#B	2.0614E+00	2.0614E+00	1.3067E+00	1.3117E+00	2.486E+00
AM-241	#A	-8.9968E-03	-8.9975E-03	3.5740E-01	3.5740E-01	3.381E-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 (84.2 to 1999.1 keV) 1.7781836E+01 pCi/gm
Total Decayed Activity (84.2 to 1999.1 keV) 1.7782005E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101f_23dec2004_1200.An1

Sample description
Detector 101 FSS-OOL-04-01-011-F

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101f_23dec2004_1200.An1

Acquisition information
Start time: 23-Dec-2004 11:50:13
Live time: 2000
Real time: 2002
Dead time: 0.12 %
Detector ID: 1

Detector system
Det 101- DSPE-633

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

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

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

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

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.3860E+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%
```

Yankee Chemistry Spectrum name: 101f_23dec2004_1200.An1

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	03-Dec-2004 14:06:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 19 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1348

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.76	285.	11.54	1.00	1.651E-02	74.81	9.600	1.750E+00	PB212
77.03	406.	8.25	1.01	1.717E-02	77.11	17.500	1.315E+00	PB212
					77.11	10.700	2.151E+00	PB214
86.82	132.	20.25	1.01	1.915E-02	86.45	32.740	2.073E-01	EU155
89.91	89.	28.69	1.02	1.957E-02				
93.27	129.	20.58	1.02	1.994E-02	92.38	2.570	2.463E+00	TH234
					92.80	3.000	2.105E+00	TH234
186.19	146.	23.49	0.87	1.857E-02	185.99	3.280	2.332E+00	RA226
209.51	77.	33.46	1.02	1.720E-02				
238.65	760.	4.25	1.12	1.558E-02	238.63	43.100	1.104E+00	PB212
241.72	130.	16.85	1.12	1.541E-02	241.00	3.900	2.101E+00	RA224
					241.92	7.470	1.100E+00	PB214
271.27	104.	25.55	1.38	1.396E-02				
277.74	48.	31.38	1.50	1.360E-02				
277.74	48.	31.38	1.50	1.360E-02	279.17	81.500	PBC<MDA	HG203
295.27	210.	9.14	1.16	1.292E-02	295.22	19.200	8.268E-01	PB214
299.76	39.	35.46	1.16	1.274E-02				
328.12	43.	32.85	0.78	1.169E-02				
338.39	172.	16.96	1.09	1.135E-02	338.40	12.010	1.229E+00	AC228
351.80	414.	6.36	1.19	1.093E-02	351.99	37.100	9.966E-01	PB214
462.38	75.	25.29	0.79	8.362E-03				
462.38	75.	25.29	0.79	8.362E-03	463.51	10.000	8.910E-01	SB125
510.56	99.	15.80	1.31	7.593E-03				
510.56	99.	15.80	1.31	7.593E-03	510.72	22.500	5.652E-01	TL208
582.91	227.	8.50	1.32	6.687E-03				
582.91	227.	8.50	1.32	6.687E-03	583.14	86.000	3.850E-01	TL208

609.13	234.	8.33	1.56	6.415E-03	609.32	46.090	7.719E-01	BI214
661.42	97.	17.53	1.57	5.939E-03	661.62	84.620	1.877E-01	CS137
727.13	54.	22.21	1.49	5.443E-03	727.17	11.800	8.228E-01	BI212
794.45	21.	38.88	1.50	5.016E-03	795.76	85.400	PBC<MDA	CS134
860.07	44.	31.70	1.50	4.679E-03				
910.85	112.	14.41	1.57	4.447E-03	911.07	29.000	8.453E-01	AC228
968.03	147.	14.10	1.21	4.215E-03	968.90	17.460	1.946E+00	AC228
1120.25	58.	19.94	1.64	3.711E-03	1120.28	15.040	1.020E+00	BI214
1460.19	545.	4.49	1.69	2.943E-03	1460.75	10.700	1.688E+01	K40

Yankee Chemistry Spectrum name: 101f_23dec2004_1200.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1764.01	49.	16.17	0.73	2.481E-03	1764.51	15.920	1.204E+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	
173.22	86.83	291.	132.	0.066	60.76	1.013	TB-160	lD
179.41	89.93	279.	89.	0.044	86.08	1.016	PB-214	lD
418.69	209.51	265.	77.	0.038	100.37	1.015	AC-228	s
542.27	271.27	214.	104.	0.052	76.66	1.383	PA-234	s
599.27	299.76	77.	39.	0.020	106.37	1.164	TH-227	lD
656.01	328.12	84.	43.	0.022	98.55	0.783	AC-228	
1720.44	860.07	39.	44.	0.022	95.09	1.499	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	149.19	74.81	335.	285.	0.142	32.54	1.005D
PB-212	153.79	77.11	359.	338.	0.169	25.57	1.006A
PB-214	153.79	77.11	576.	190.	0.095	5.18	1.499A
TH-234	185.47	92.95	701.	172.	0.086	69.21	1.499s
TH-234	185.53	92.98	703.	150.	0.075	78.92	1.499s
RA-226	371.60	185.97	424.	117.	0.058	79.81	1.499s
PB-212	476.96	238.63	142.	760.	0.380	12.75	1.122D
RA-224	483.17	241.74	445.	109.	0.054	86.97	1.499
PB-214	483.54	241.92	142.	123.	0.061	49.33	1.124D
HG-203	555.20	277.74	118.	48.	0.024	94.15	1.499s
PB-214	590.28	295.27	133.	215.	0.108	32.25	1.217
AC-228	676.74	338.48	205.	178.	0.089	50.44	1.096s
PB-214	703.40	351.80	104.	414.	0.207	19.08	1.188
SB-125	925.91	463.01	97.	44.	0.022	105.21	1.499s
TL-208	1021.23	510.64	70.	69.	0.034	62.99	1.499s
TL-208	1166.12	583.05	35.	221.	0.110	23.15	1.499
BI-214	1218.30	609.13	56.	234.	0.117	24.98	1.564
CS-137	1322.93	661.42	59.	97.	0.048	52.58	1.565s
BI-212	1454.42	727.13	38.	54.	0.027	66.63	1.485
CS-134	1589.13	794.45	23.	21.	0.011	116.63	1.502s
AC-228	1822.05	910.85	46.	112.	0.056	43.24	1.569

Yankee Chemistry Spectrum name: 101f_23dec2004_1200.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1936.48	968.03	61.	147.	0.073	42.29	1.213s
BI-214	2241.09	1120.25	27.	58.	0.029	59.81	1.639s
K-40	2921.40	1460.19	13.	545.	0.273	13.47	1.693
BI-214	3529.45	1764.01	3.	49.	0.024	48.50	0.734s

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		-1.1150E-01					
			477.56	-1.115E-01	%(	6.980E-01 2.04E-01	G
K-40		1.6884E+01					
			1460.75	1.688E+01	(	6.002E-01 7.58E-01	G
MN-54		-6.3134E-03					
			834.81	-6.313E-03	%(	6.319E-02 1.78E-02	G
CO-57		-1.2204E-02					
			122.07	-1.220E-02	%(P	6.714E-02 2.01E-02	G K
			136.43	5.654E-02	&	5.455E-01 1.63E-01	G
CO-60		-2.8148E-02					
			1332.51	-2.815E-02	%(P	9.749E-02 2.52E-02	G K
			1173.23	2.794E-03	& P	9.179E-02 2.47E-02	G K
Sr-85		-3.0575E-02					
			514.00	-3.057E-02	&(	9.549E-02 2.85E-02	G
Kr-85		-5.7061E+02					
			513.99	-5.706E+02	&(	1.782E+03 5.32E+02	G
Y-88		-9.8841E-03					
			1836.01	-9.884E-03	%(P	9.488E-02 2.55E-02	G K
			898.02	-9.153E-03	% P	7.426E-02 2.06E-02	G
NB-94		2.6035E-02					
			871.10	2.603E-02	%(	3.857E-02 1.24E-02	G K
			702.50	2.113E-02	%	4.717E-02 1.42E-02	G K
Ag-108M		1.5796E-02					
			722.95	1.580E-02	%(	6.405E-02 1.87E-02	G K
			614.37	-1.690E-02	%	6.308E-02 1.85E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		433.93	-7.122E-03	%	5.359E-02	1.55E-02	G
CD-109	8.7655E-02						
		88.04	8.766E-02	&(	2.014E+00	6.01E-01	G
SN-113	-2.0890E-03						
		391.71	-2.089E-03	%(P	1.097E-01	3.18E-02	G K
		255.04	-9.358E-03	%	2.682E+00	7.84E-01	G
SB-125	1.4697E-01						
		427.95	2.029E-02	&(	1.703E-01	4.94E-02	G K
		600.77	1.389E-01	%	3.036E-01	9.18E-02	G
		636.15	7.869E-02	%	4.059E-01	1.16E-01	G
		463.51	5.219E-01	*(	5.768E-01	1.83E-01	G
		176.29	1.230E-01	&	7.477E-01	2.22E-01	G
I-131	-6.2730E-03						
		364.48	-6.273E-03	&(	3.111E-01	8.94E-02	G K
		636.97	3.987E-01	%	4.123E+00	1.17E+00	G
		284.29	1.003E+00	%	4.205E+00	1.25E+00	G
CS-134	1.4236E-02						
		604.66	-1.618E-02	&(	8.256E-02	2.43E-02	G K
		795.76	4.900E-02	*(	5.831E-02	1.90E-02	G
		569.29	1.371E-01	%	3.057E-01	9.23E-02	G
		801.84	-4.096E-02	%	6.976E-01	1.95E-01	G
CS-137	1.8770E-01						
		661.62	1.877E-01	@(	7.505E-02	3.29E-02	G
CE-139	-1.9437E-02						
		165.85	-1.944E-02	%(P	7.390E-02	2.22E-02	G
EU-152	-2.7074E-02						
		121.78	-2.707E-02	%(	1.850E-01	5.52E-02	G K
		344.30	-2.014E-02	%	1.847E-01	5.40E-02	G
		1408.08	1.841E-01	%	2.375E-01	7.97E-02	G
		964.00	8.305E-03	&	7.526E-01	2.16E-01	G
		1112.07	-7.218E-02	%	6.208E-01	1.77E-01	G
		778.90	7.204E-02	&	3.933E-01	1.12E-01	G
EU-154	-2.3295E-02						
		123.10	-2.329E-02	%(	1.326E-01	3.96E-02	G K
		1274.80	0.000E+00	%	3.295E-01	9.32E-02	G
		723.30	-1.468E-01	%	4.544E-01	1.35E-01	G
		1004.80	-4.384E-02	%	3.768E-01	1.06E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.6728E-03						
		86.45	1.673E-03	%(	2.340E-01	6.97E-02	G K
		105.31	9.405E-02	%	2.411E-01	7.28E-02	G
HG-203	5.6929E-02						
		279.17	5.693E-02	@(P	6.308E-02	1.98E-02	G K
		72.87	-5.833E-01	%	2.224E+00	6.70E-01	G
		70.83	-2.553E+00	&	3.731E+00	1.14E+00	G
		82.50	-3.224E-02	%	3.813E+00	1.13E+00	G
TL-208	3.7828E-01						
		583.14	3.743E-01	(	5.116E-02	2.89E-02	G
		510.72	3.934E-01	*(	2.384E-01	8.26E-02	G
PB-212	1.1036E+00						
		238.63	1.104E+00	(	8.446E-02	4.69E-02	G K
							Energy duplication
		77.11	1.095E+00	}	2.946E-01	9.33E-02	G
		74.81	1.750E+00	+	5.404E-01	1.90E-01	G
PB-214	1.0039E+00						
		351.99	9.966E-01	(	1.207E-01	6.34E-02	G K
		295.22	8.450E-01	-	2.219E-01	9.09E-02	G
							Energy duplication
		77.11	1.004E+00	}	6.066E-01	1.73E-02	G
		241.92	1.040E+00	(	4.941E-01	1.71E-01	G
BI-212	8.2279E-01						
		727.17	8.228E-01	(	4.761E-01	1.83E-01	G K
		1620.56	-3.511E-01	%	2.895E+00	7.99E-01	G
		785.42	1.313E+00	%	2.946E+00	8.89E-01	G
BI-214	7.7193E-01						
		609.32	7.719E-01	(	1.240E-01	6.43E-02	G K
		1764.51	1.204E+00	+	2.726E-01	1.95E-01	G
		1120.28	1.020E+00	+	4.672E-01	2.03E-01	G
RA-224	1.7634E+00						
		241.00	1.763E+00	(	1.634E+00	5.11E-01	G
RA-226	1.8676E+00						
		185.99	1.868E+00	*(	1.578E+00	4.97E-01	G
AC-228	8.4534E-01						
		911.07	8.453E-01	(	2.600E-01	1.22E-01	G K
		968.90	1.946E+00	+	5.192E-01	2.74E-01	G
		338.40	1.273E+00	+	4.966E-01	2.14E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-2.3533E-01						
		236.00	-2.353E-01	%(	6.326E-01	1.91E-01	G K
		256.25	-3.491E-02	&	7.522E-01	2.21E-01	G
PA-234	4.0555E-03						
		98.44	4.055E-03	%(	2.351E-01	6.98E-02	G K
		946.00	-2.094E-02	%	3.223E-01	8.98E-02	G
		131.28	5.258E-03	%	2.813E-01	8.36E-02	G
		94.67	-7.273E-02	%	4.194E-01	1.26E-01	G
		883.24	6.065E-03	&	5.088E-01	1.40E-01	G
		926.70	-1.798E-02	%	5.251E-01	1.44E-01	G
		569.26	1.997E-01	%	4.453E-01	1.34E-01	G
TH-234	1.8621E+00						
		63.29	4.706E-01	%(	2.821E+00	8.44E-01	G K
		92.80	2.450E+00	(	2.063E+00	6.45E-01	G
		92.38	3.287E+00	(	2.410E+00	7.58E-01	G
AM-241	-7.5135E-02						
		59.54	-7.514E-02	%(P	3.732E-01	1.12E-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	-8.6109E-02	-1.1150E-01	6.1075E-01	6.1078E-01	5.391E-01
K-40		1.6884E+01	1.6884E+01	2.2737E+00	2.4657E+00	
MN-54	#A	-6.0405E-03	-6.3134E-03	5.3434E-02	5.3435E-02	6.045E-02
CO-57	#B	-1.1596E-02	-1.2204E-02	6.8007E-02	6.8010E-02	6.379E-02
CO-60	#B	-2.7947E-02	-2.8148E-02	4.4208E-01	4.4208E-01	9.679E-02
Sr-85	#A	-2.4714E-02	-3.0575E-02	8.5593E-02	8.5610E-02	7.719E-02
Kr-85	#A	-5.7053E+02	-5.7061E+02	1.5974E+03	1.5978E+03	1.782E+03
Y-88	#B	-8.6841E-03	-9.8841E-03	9.6869E-02	9.6870E-02	8.336E-02
NB-94	#B	2.6035E-02	2.6035E-02	3.7266E-02	3.7295E-02	3.857E-02
Ag-108M	#B	1.5791E-02	1.5796E-02	5.6011E-02	5.6018E-02	6.403E-02
CD-109	#A	8.5027E-02	8.7655E-02	1.8026E+00	1.8027E+00	1.953E+00
SN-113	#B	-1.8530E-03	-2.0890E-03	2.2860E-01	2.2860E-01	9.732E-02
SB-125	#B	1.4498E-01	1.4697E-01	1.5463E-01	1.5485E-01	1.680E-01
I-131	#B	-1.1277E-03	-6.2730E-03	2.6827E-01	2.6827E-01	5.592E-02
CS-134	#B	1.3978E-02	1.4236E-02	1.6604E-02	1.6623E-02	8.106E-02
CS-137	#	1.8746E-01	1.8770E-01	9.8695E-02	9.9263E-02	
CE-139	#A	-1.7581E-02	-1.9437E-02	6.7146E-02	6.7155E-02	6.685E-02
EU-152	#B	-2.6994E-02	-2.7074E-02	1.6568E-01	1.6569E-01	1.844E-01
EU-154	#B	-2.3192E-02	-2.3295E-02	1.1889E-01	1.1890E-01	1.320E-01
EU-155	#B	1.6601E-03	1.6728E-03	2.0923E-01	2.0923E-01	2.322E-01
HG-203	#A	4.2337E-02	5.6929E-02	5.9275E-02	5.9362E-02	4.691E-02
TL-208	#	3.7828E-01	3.7828E-01	8.7579E-02	9.0150E-02	5.116E-02
PB-212		1.1036E+00	1.1036E+00	1.4071E-01	1.5391E-01	
PB-214		1.0039E+00	1.0039E+00	1.9155E-01	1.9977E-01	
BI-212		8.2279E-01	8.2279E-01	5.4825E-01	5.5021E-01	
BI-214		7.7193E-01	7.7193E-01	1.9282E-01	1.9769E-01	
RA-224	#	1.7634E+00	1.7634E+00	1.5337E+00	1.5369E+00	1.634E+00
RA-226	#	1.8676E+00	1.8676E+00	1.4906E+00	1.4943E+00	1.578E+00
AC-228		8.4534E-01	8.4534E-01	3.6551E-01	3.6861E-01	
TH-227	#B	-2.3533E-01	-2.3533E-01	5.7261E-01	5.7276E-01	6.326E-01
PA-234	#B	4.0555E-03	4.0555E-03	2.0954E-01	2.0954E-01	2.351E-01
TH-234	#B	1.8621E+00	1.8621E+00	1.2887E+00	1.2928E+00	2.821E+00
AM-241	#A	-7.5129E-02	-7.5135E-02	3.4249E-01	3.4251E-01	3.732E-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

Yankee Chemistry Spectrum name: 101f_23dec2004_1200.An1

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

Total Activity (271.1 to 1999.1 keV) 2.1618650E+01 pCi/gm
Total Decayed Activity (271.1 to 1999.1 keV) 2.1618885E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101f_23dec2004_1235.An1

Sample description
Detector 101 FSS-OOL-04-01-019-F

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101f_23dec2004_1235.An1

Acquisition information
Start time: 23-Dec-2004 12:26:54
Live time: 2000
Real time: 2003
Dead time: 0.15 %
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: 1.0890E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.0890E+03) =
9.1827E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101f_23dec2004_1235.An1

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	03-Dec-2004 14:02:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2048

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.78	161.	26.43	1.50	1.654E-02	72.87	6.400	2.643E+00	HG203
					74.81	9.600	1.259E+00	PB212
77.07	308.	13.51	1.50	1.720E-02	77.11	17.500	1.270E+00	PB212
					77.11	10.700	2.077E+00	PB214
77.07	308.	13.51	1.50	1.720E-02	77.11	17.500	1.270E+00	PB212
					77.11	10.700	2.077E+00	PB214
86.91	124.	20.38	1.01	1.913E-02	86.45	32.740	2.486E-01	EU155
90.02	81.	28.74	1.02	1.955E-02				
93.17	120.	20.09	1.02	1.991E-02	92.38	2.570	2.912E+00	TH234
					92.80	3.000	2.489E+00	TH234
185.96	104.	27.92	0.93	1.858E-02				
185.96	104.	27.92	0.93	1.858E-02	185.99	3.280	2.107E+00	RA226
208.64	82.	30.58	1.30	1.725E-02				
238.69	604.	4.70	1.12	1.557E-02	238.63	43.100	1.116E+00	PB212
241.52	112.	18.60	1.12	1.542E-02	241.00	3.900	2.317E+00	RA224
					241.92	7.470	1.213E+00	PB214
270.57	64.	39.68	1.11	1.399E-02				
295.27	188.	13.70	1.06	1.292E-02	295.22	19.200	9.394E-01	PB214
338.11	138.	18.12	1.33	1.136E-02	338.40	12.010	1.254E+00	AC228
352.03	296.	7.96	1.11	1.092E-02	351.99	37.100	9.056E-01	PB214
462.84	40.	31.21	1.50	8.342E-03	463.51	10.000	6.056E-01	SB125
510.64	85.	19.31	1.29	7.592E-03	510.72	22.500	6.205E-01	TL208
582.97	185.	8.81	1.25	6.686E-03	583.14	86.000	3.991E-01	TL208
609.17	237.	8.41	1.12	6.414E-03	609.32	46.090	9.938E-01	BI214
661.38	90.	15.55	1.10	5.939E-03	661.62	84.620	2.223E-01	CS137
726.75	42.	29.84	1.12	5.446E-03	727.17	11.800	8.134E-01	BI212

794.54	47.	31.90	0.89	5.023E-03				
794.54	47.	31.90	0.89	5.023E-03	795.76	85.400	1.393E-01	CS134
910.87	121.	12.17	1.34	4.447E-03	911.07	29.000	1.164E+00	AC228
968.48	101.	14.35	1.58	4.214E-03	968.90	17.460	1.709E+00	AC228

Yankee Chemistry Spectrum name: 101f_23dec2004_1235.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1119.68	34.	25.05	1.59	3.711E-03	1120.28	15.040	7.582E-01	BI214
1172.92	17.	37.88	1.75	3.565E-03	1173.23	99.860	PBC<MDA	CO60
1460.34	421.	4.87	1.75	2.943E-03	1460.75	10.700	1.659E+01	K40
1763.92	46.	14.74	1.01	2.481E-03	1764.51	15.920	1.445E+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	
179.63	89.77	230.	81.	0.040	86.22	1.016	PB-214	lD
416.96	208.64	225.	82.	0.041	91.73	1.305	LU-177	s
477.09	238.68	100.	604.	0.302	14.09	1.122	PB-212	D
482.74	241.51	163.	112.	0.056	55.79	1.124	PB-214	D
540.87	270.57	209.	64.	0.032	119.03	1.105	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	149.13	74.78	826.	161.	0.081	79.28	1.499s
PB-212	153.79	77.11	712.	308.	0.154	40.53	1.499D
PB-214	153.79	77.11	712.	308.	0.154	40.53	1.499D
EU-155	173.53	86.98	675.	116.	0.058	98.92	1.499
TH-234	185.70	93.06	555.	141.	0.071	75.05	1.499s
TH-234	185.67	93.04	544.	139.	0.069	75.79	1.499s
RA-226	371.41	185.88	331.	86.	0.043	95.65	1.499s
PB-212	477.02	238.66	364.	472.	0.236	21.99	1.499
RA-224	483.09	241.69	393.	97.	0.048	91.95	1.499
PB-214	590.14	295.20	169.	143.	0.072	45.94	1.499
AC-228	676.01	338.11	147.	138.	0.069	54.36	1.331s
PB-214	703.77	351.99	103.	254.	0.127	25.30	1.499
SB-125	925.58	462.84	58.	40.	0.020	93.63	1.499s
TL-208	1021.78	510.92	65.	111.	0.056	49.73	1.328s
TL-208	1165.95	582.97	35.	185.	0.092	26.44	1.251
BI-214	1218.37	609.17	48.	237.	0.118	25.22	1.125
CS-137	1322.85	661.38	39.	90.	0.045	46.66	1.103
BI-212	1453.65	726.75	40.	42.	0.021	89.52	1.120s
CS-134	1589.33	794.55	34.	30.	0.015	98.25	1.502s
AC-228	1822.09	910.87	32.	121.	0.060	36.52	1.342

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1937.37	968.48	30.	101.	0.051	43.04	1.579
BI-214	2239.94	1119.68	17.	34.	0.017	75.15	1.590
K-40	2921.70	1460.34	0.	421.	0.211	14.62	1.754
BI-214	3529.27	1763.92	0.	46.	0.023	44.23	1.008s

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		1.6846E-01					
			477.56	1.685E-01	%(	6.743E-01 1.97E-01	G
K-40		1.6593E+01					
			1460.75	1.659E+01	(	2.905E-01 8.08E-01	G
MN-54		2.7069E-02					
			834.81	2.707E-02	%(	6.525E-02 1.95E-02	G
CO-57		1.1285E-02					
			122.07	1.128E-02	&(P	7.355E-02 2.19E-02	G K
			136.43	-1.026E-01	%	6.124E-01 1.83E-01	G
CO-60		1.2863E-02					
			1332.51	1.286E-02	%(P	9.224E-02 2.38E-02	G K
			1173.23	5.806E-02	% P	1.058E-01 3.12E-02	G K
Sr-85		-2.3028E-02					
			514.00	-2.303E-02	%(	8.763E-02 2.58E-02	G
Kr-85		-4.2985E+02					
			513.99	-4.298E+02	%(	1.635E+03 4.82E+02	G
Y-88		-1.5074E-02					
			1836.01	-1.507E-02	%(P	1.095E-01 2.94E-02	G K
			898.02	2.143E-02	% P	8.000E-02 2.29E-02	G
NB-94		-2.5225E-04					
			871.10	-2.522E-04	%(	7.441E-02 2.04E-02	G K
			702.50	3.033E-04	&	7.200E-02 2.00E-02	G K
Ag-108M		-1.7860E-02					
			722.95	-1.786E-02	%(	9.278E-02 2.69E-02	G K
			614.37	-2.276E-02	%	7.609E-02 2.24E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		433.93	-4.427E-03	&	7.159E-02	2.06E-02	G
CD-109	3.4161E-02						
		88.04	3.416E-02	&(	2.043E+00	6.06E-01	G
SN-113	-6.3239E-04						
		391.71	-6.324E-04	&(P	1.257E-01	3.62E-02	G K
		255.04	2.535E-01	&	3.180E+00	9.34E-01	G
SB-125	2.1944E-01						
		427.95	8.897E-02	&(	1.873E-01	5.68E-02	G K
		600.77	4.660E-02	%	3.128E-01	8.91E-02	G
		636.15	-8.879E-02	%	6.305E-01	1.81E-01	G
		463.51	6.056E-01	(	5.783E-01	1.89E-01	G
		176.29	-3.248E-01	%	1.007E+00	3.03E-01	G
I-131	1.6677E-01						
		364.48	1.668E-01	%(	3.127E-01	9.56E-02	G K
		636.97	-3.038E-01	&	5.047E+00	1.42E+00	G
		284.29	0.000E+00	%	5.341E+00	1.55E+00	G
CS-134	4.0771E-02						
		604.66	-2.134E-03	&(	2.112E-01	6.25E-02	G K
		795.76	8.980E-02	@(	8.871E-02	2.94E-02	G
		569.29	7.177E-02	&	3.810E-01	1.10E-01	G
		801.84	1.549E-01	%	8.252E-01	2.36E-01	G
CS-137	2.2232E-01						
		661.62	2.223E-01	(	7.876E-02	3.46E-02	G
CE-139	-2.4044E-02						
		165.85	-2.404E-02	%(P	8.153E-02	2.45E-02	G
EU-152	3.4953E-02						
		121.78	3.495E-02	&(	2.097E-01	6.26E-02	G K
		344.30	1.228E-02	%	2.019E-01	5.83E-02	G
		1408.08	6.913E-02	%	3.793E-01	1.06E-01	G
		964.00	1.064E-03	%	6.650E-01	1.85E-01	G
		1112.07	-6.808E-02	&	7.527E-01	2.12E-01	G
		778.90	-2.023E-03	&	5.420E-01	1.49E-01	G
EU-154	3.1764E-02						
		123.10	3.176E-02	&(	1.375E-01	4.11E-02	G K
		1274.80	-3.318E-02	%	3.107E-01	8.76E-02	G
		723.30	-7.167E-02	%	4.486E-01	1.30E-01	G
		1004.80	-5.900E-03	%	4.315E-01	1.17E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	2.3231E-01						
		86.45	2.323E-01	(	2.476E-01	7.66E-02	G K
		105.31	8.276E-02	%	3.004E-01	9.02E-02	G
HG-203	2.8670E-02						
		279.17	2.867E-02	%(P	8.877E-02	2.63E-02	G K
		72.87	-4.435E-01	&	2.529E+00	7.59E-01	G
		70.83	1.346E+00	%	3.830E+00	1.16E+00	G
		82.50	0.000E+00	%	5.770E+00	1.72E+00	G
TL-208	3.9913E-01						
		583.14	3.991E-01	(	6.545E-02	3.52E-02	G
		510.72	8.065E-01	+	2.927E-01	1.34E-01	G
PB-212	8.7343E-01						
		238.63	8.734E-01	(	1.693E-01	6.40E-02	G K
							Energy duplication
		77.11	1.270E+00	+	5.237E-01	1.72E-01	G
		74.81	1.259E+00	+	1.068E+00	3.33E-01	G
PB-214	7.5800E-01						
		351.99	7.791E-01	(	1.531E-01	6.57E-02	G K
		295.22	7.172E-01	(	3.169E-01	1.10E-01	G
							Energy duplication
		77.11	2.077E+00	+	8.566E-01	2.81E-01	G
		241.92	1.724E-02	%	1.283E+00	3.81E-01	G
BI-212	8.1341E-01						
		727.17	8.134E-01	@(	6.211E-01	2.43E-01	G K
		1620.56	7.587E-01	%	2.407E+00	6.92E-01	G
		785.42	1.037E+00	%	4.013E+00	1.17E+00	G
BI-214	9.9379E-01						
		609.32	9.938E-01	(	1.474E-01	8.35E-02	G K
		1764.51	1.445E+00	+	2.315E-01	2.13E-01	G
		1120.28	7.582E-01	-	4.862E-01	1.90E-01	G
RA-224	1.9972E+00						
		241.00	1.997E+00	(	1.959E+00	6.12E-01	G
RA-226	1.7465E+00						
		185.99	1.746E+00	*(	1.782E+00	5.57E-01	G
AC-228	1.1908E+00						
		911.07	1.164E+00	(	2.798E-01	1.42E-01	G K
		968.90	1.709E+00	+	4.742E-01	2.45E-01	G
		338.40	1.254E+00	(	5.394E-01	2.27E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-1.1591E-01						
		236.00	-1.159E-01	%(	7.288E-01	2.17E-01	G K
		256.25	-1.324E-02	%	8.135E-01	2.37E-01	G
PA-234	-2.7151E-02						
		98.44	-2.715E-02	%(	2.610E-01	7.76E-02	G K
		946.00	6.820E-03	%	3.753E-01	1.03E-01	G
		131.28	2.896E-02	&	3.098E-01	9.21E-02	G
		94.67	-2.552E-01	%	4.959E-01	1.51E-01	G
		883.24	-5.963E-02	%	5.780E-01	1.61E-01	G
		926.70	-3.922E-02	%	7.641E-01	2.13E-01	G
		569.26	3.755E-03	&	6.052E-01	1.70E-01	G
TH-234	2.5579E+00						
		63.29	1.727E+00	%(	3.319E+00	1.01E+00	G K
		92.80	2.882E+00	(	2.316E+00	7.28E-01	G
		92.38	3.440E+00	(	2.736E+00	8.60E-01	G
AM-241	-5.2946E-03						
		59.54	-5.295E-03	&(P	4.860E-01	1.44E-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	1.3006E-01	1.6846E-01	5.9164E-01	5.9172E-01	5.206E-01
K-40		1.6593E+01	1.6593E+01	2.4261E+00	2.6010E+00	
MN-54	#A	2.5897E-02	2.7069E-02	5.8649E-02	5.8669E-02	6.243E-02
CO-57	#B	1.0722E-02	1.1285E-02	6.5698E-02	6.5701E-02	6.988E-02
CO-60	#B	1.2771E-02	1.2863E-02	7.1281E-02	7.1285E-02	9.158E-02
Sr-85	#A	-1.8608E-02	-2.3028E-02	7.7514E-02	7.7525E-02	7.081E-02
Kr-85	#A	-4.2978E+02	-4.2985E+02	1.4463E+03	1.4465E+03	1.635E+03
Y-88	#B	-1.3242E-02	-1.5074E-02	1.0732E-01	1.0733E-01	9.616E-02
NB-94	#B	-2.5225E-04	-2.5225E-04	6.1178E-02	6.1178E-02	7.441E-02
Ag-108M	#B	-1.7854E-02	-1.7860E-02	8.0818E-02	8.0824E-02	9.275E-02
CD-109	#A	3.3135E-02	3.4161E-02	1.8188E+00	1.8188E+00	1.982E+00
SN-113	#B	-5.6085E-04	-6.3239E-04	1.7649E-01	1.7649E-01	1.115E-01
SB-125	#F	2.1647E-01	2.1944E-01	2.0547E-01	2.0584E-01	1.847E-01
I-131	#B	2.9905E-02	1.6677E-01	2.8675E-01	2.8691E-01	5.608E-02
CS-134	#B	4.0029E-02	4.0771E-02	4.0057E-02	4.0123E-02	2.074E-01
CS-137		2.2204E-01	2.2232E-01	1.0372E-01	1.0448E-01	
CE-139	#A	-2.1745E-02	-2.4044E-02	7.4104E-02	7.4116E-02	7.374E-02
EU-152	#B	3.4850E-02	3.4953E-02	1.8768E-01	1.8769E-01	2.091E-01
EU-154	#B	3.1623E-02	3.1764E-02	1.2326E-01	1.2327E-01	1.369E-01
EU-155	#A	2.3054E-01	2.3231E-01	2.2981E-01	2.3017E-01	2.458E-01
HG-203	#B	2.1312E-02	2.8670E-02	7.8931E-02	7.8947E-02	6.599E-02
TL-208		3.9913E-01	3.9913E-01	1.0554E-01	1.0793E-01	
PB-212	#	8.7343E-01	8.7343E-01	1.9209E-01	1.9833E-01	1.693E-01
PB-214	#	7.5800E-01	7.5800E-01	1.9175E-01	1.9648E-01	1.531E-01
BI-212	#	8.1341E-01	8.1341E-01	7.2814E-01	7.2959E-01	
BI-214		9.9379E-01	9.9379E-01	2.5068E-01	2.5689E-01	
RA-224	#	1.9972E+00	1.9972E+00	1.8365E+00	1.8400E+00	1.959E+00
RA-226	#A	1.7464E+00	1.7465E+00	1.6704E+00	1.6733E+00	1.781E+00
AC-228		1.1908E+00	1.1908E+00	3.8994E-01	3.9571E-01	
TH-227	#B	-1.1591E-01	-1.1591E-01	6.5181E-01	6.5184E-01	7.288E-01
PA-234	#B	-2.7151E-02	-2.7151E-02	2.3290E-01	2.3291E-01	2.610E-01
TH-234	#B	2.5579E+00	2.5579E+00	1.7486E+00	1.7543E+00	3.319E+00
AM-241	#A	-5.2941E-03	-5.2946E-03	6.4313E-01	6.4313E-01	4.859E-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

Yankee Chemistry Spectrum name: 101f_23dec2004_1235.An1

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

Total Activity (270.1 to 1999.1 keV) 2.0212265E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 2.0212543E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_23DEC2004_1350.An1

Sample description
Detector 101 FSS-OOL-04-01-026-I

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_23DEC2004_1350.An1

Acquisition information

Start time:	23-Dec-2004 13:46:08
Live time:	2000
Real time:	2003
Dead time:	0.14 %
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:	1.3890E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.3890E+03) = 7.1994E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_23DEC2004_1350.An1

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	06-Dec-2004 13:23:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1644

***** 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
74.30	146.	20.23	1.00	1.638E-02				
74.30	146.	20.23	1.00	1.638E-02	74.81	9.600	8.974E-01	PB212
77.69	216.	15.23	1.01	1.736E-02	77.11	17.500	6.986E-01	PB212
					77.11	10.700	1.143E+00	PB214
87.00	135.	21.33	1.01	1.913E-02	86.45	32.740	2.110E-01	EU155
89.76	71.	35.63	1.02	1.951E-02				
93.53	98.	28.79	1.02	1.994E-02	92.38	2.570	1.869E+00	TH234
					92.80	3.000	1.598E+00	TH234
128.55	82.	37.11	0.78	2.110E-02				
186.29	136.	22.65	1.20	1.857E-02	185.99	3.280	2.163E+00	RA226
209.45	83.	32.07	1.04	1.721E-02				
238.66	661.	4.65	1.12	1.557E-02				
238.66	661.	4.65	1.12	1.557E-02	238.63	43.100	9.573E-01	PB212
241.49	111.	18.31	1.12	1.543E-02	241.00	3.900	1.793E+00	RA224
					241.92	7.470	9.388E-01	PB214
270.15	70.	33.96	0.82	1.401E-02				
278.06	57.	36.40	0.89	1.365E-02				
295.09	165.	15.60	1.17	1.293E-02				
295.09	165.	15.60	1.17	1.293E-02	295.22	19.200	6.455E-01	PB214
300.46	70.	29.36	1.54	1.271E-02				
338.09	160.	17.20	1.14	1.136E-02	338.40	12.010	1.141E+00	AC228
351.83	318.	7.38	1.15	1.093E-02				
351.83	318.	7.38	1.15	1.093E-02	351.99	37.100	7.633E-01	PB214
408.71	38.	35.59	1.08	9.438E-03				
462.64	61.	32.80	1.16	8.357E-03				
462.64	61.	32.80	1.16	8.357E-03	463.51	10.000	7.151E-01	SB125

510.90	88.	22.62	1.29	7.588E-03	510.72	22.500	5.024E-01	TL208
582.98	219.	9.84	1.38	6.686E-03				
582.98	219.	9.84	1.38	6.686E-03	583.14	86.000	3.706E-01	TL208
609.21	220.	10.09	1.23	6.414E-03	609.32	46.090	7.225E-01	BI214
726.78	62.	24.77	1.05	5.446E-03	727.17	11.800	9.407E-01	BI212
910.95	125.	12.82	1.32	4.447E-03	911.07	29.000	9.401E-01	AC228
967.40	125.	14.77	1.70	4.218E-03	968.90	17.460	1.651E+00	AC228
1110.53	21.	37.20	1.71	3.735E-03	1112.07	13.580	PBC<MDA	EU152
1120.54	61.	24.14	1.07	3.711E-03	1120.28	15.040	1.070E+00	BI214
1460.29	563.	4.41	1.99	2.943E-03	1460.75	10.700	1.739E+01	K40
1763.62	38.	16.22	1.50	2.483E-03	1764.51	15.920	9.359E-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	
179.09	89.46	286.	71.	0.036	106.90	1.016	PB-214	lD
418.57	209.45	254.	83.	0.042	96.22	1.039	AC-228	s
477.01	238.62	141.	661.	0.330	13.94	1.122	PB-212	D
482.68	241.45	151.	111.	0.056	54.92	1.123	RA-224	D
540.02	270.15	198.	70.	0.035	101.87	0.820	AC-228	
555.86	278.06	157.	57.	0.029	109.20	0.894	NP-239	l
600.67	300.46	141.	70.	0.035	80.44	1.536	PB-212	s
817.26	408.71	68.	38.	0.019	106.78	1.078	CS-138	s

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

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.01	74.72	877.	171.	0.086	76.87	1.499
PB-212	153.79	77.11	771.	305.	0.153	42.23	1.499D
PB-214	153.79	77.11	771.	305.	0.153	42.23	1.499D
EU-155	173.71	87.07	760.	131.	0.066	92.98	1.499
TH-234	185.71	93.06	725.	135.	0.067	88.54	1.499s
TH-234	185.68	93.05	703.	137.	0.068	86.12	1.499s
RA-226	371.62	185.98	369.	120.	0.060	73.47	1.499s
PB-212	476.96	238.63	342.	488.	0.244	21.06	1.499D
RA-224	483.15	241.73	403.	104.	0.052	87.25	1.499
PB-214	590.03	295.14	189.	156.	0.078	44.46	1.499
AC-228	675.97	338.09	175.	160.	0.080	51.60	1.137
PB-214	703.47	351.84	88.	272.	0.136	23.33	1.499
SB-125	925.61	462.86	61.	43.	0.021	90.20	1.499
TL-208	1021.44	510.75	99.	61.	0.031	78.59	1.499s
TL-208	1166.15	583.07	42.	202.	0.101	25.09	1.499
BI-214	1218.45	609.21	78.	220.	0.110	30.28	1.228
BI-212	1453.72	726.78	53.	62.	0.031	74.32	1.049s
AC-228	1822.25	910.95	38.	125.	0.062	38.46	1.320
AC-228	1935.22	967.40	51.	125.	0.062	44.31	1.704s
EU-152	2221.63	1110.53	19.	21.	0.010	111.59	1.708
BI-214	2241.67	1120.54	41.	61.	0.031	72.43	1.069s
K-40	2921.60	1460.29	11.	563.	0.281	13.22	1.993

Yankee Chemistry Spectrum name: 101F_23DEC2004_1350.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3529.72	1764.14	0.	26.	0.013	58.79	2.106

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

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

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.6707E-01					
			477.56	1.671E-01	&(	5.711E-01 1.69E-01	G
K-40		1.7394E+01					
			1460.75	1.739E+01	(	5.635E-01 7.66E-01	G
MN-54		-3.7196E-03					
			834.81	-3.720E-03	%(	6.180E-02 1.73E-02	G
CO-57		-1.1314E-02					
			122.07	-1.131E-02	%(P	6.320E-02 1.89E-02	G K
			136.43	-1.751E-01	%	5.310E-01 1.60E-01	G
CO-60		6.9605E-03					
			1332.51	6.960E-03	%(P	7.831E-02 2.03E-02	G K
			1173.23	2.500E-02	% P	9.066E-02 2.56E-02	G K
Sr-85		-1.9338E-02					
			514.00	-1.934E-02	%(	8.400E-02 2.48E-02	G
Kr-85		-3.7273E+02					
			513.99	-3.727E+02	%(	1.617E+03 4.78E+02	G
Y-88		-1.1281E-03					
			1836.01	-1.128E-03	&(P	3.371E-02 4.57E-03	G K
			898.02	-2.056E-02	% P	8.680E-02 2.50E-02	G
NB-94		6.3479E-03					
			871.10	6.348E-03	%(	5.674E-02 1.59E-02	G K
			702.50	-8.023E-03	%	6.044E-02 1.73E-02	G K
Ag-108M		-1.6822E-02					
			722.95	-1.682E-02	%(	7.834E-02 2.29E-02	G K
			614.37	-1.334E-02	&	6.803E-02 1.98E-02	G
			433.93	2.601E-02	%	4.243E-02 1.31E-02	G

Yankee Chemistry Spectrum name: 101F_23DEC2004_1350.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	6.4868E-02						
		88.04	6.487E-02	&(	1.947E+00	5.80E-01	G
SN-113	-4.6695E-03						
		391.71	-4.669E-03	&(P	9.643E-02	2.78E-02	G K
		255.04	8.950E-01	%	1.873E+00	5.68E-01	G
SB-125	1.7311E-01						
		427.95	6.086E-02	%(	1.461E-01	4.39E-02	G K
		600.77	0.000E+00	&	2.962E-01	8.31E-02	G
		636.15	1.819E-01	&	4.860E-01	1.45E-01	G
		463.51	5.053E-01	(	4.632E-01	1.52E-01	G
		176.29	-8.690E-02	%	8.277E-01	2.46E-01	G
I-131	7.4749E-02						
		364.48	7.475E-02	%(	2.559E-01	7.61E-02	G K
		636.97	1.142E+00	%	3.488E+00	1.03E+00	G
		284.29	3.821E-01	&	3.474E+00	1.02E+00	G
CS-134	1.6687E-03						
		604.66	1.669E-03	%(	1.581E-01	4.67E-02	G K
		795.76	2.461E-03	&	7.864E-02	2.21E-02	G
		569.29	1.495E-01	%	3.353E-01	1.01E-01	G
		801.84	0.000E+00	%	9.217E-01	2.61E-01	G
CS-137	1.9215E-02						
		661.62	1.921E-02	%(	6.966E-02	2.05E-02	G
CE-139	1.1991E-02						
		165.85	1.199E-02	&(P	6.620E-02	1.97E-02	G
EU-152	1.1329E-01						
		121.78	-1.840E-02	%(	1.788E-01	5.32E-02	G K
		344.30	-3.338E-02	%	1.827E-01	5.38E-02	G
		1408.08	-1.441E-02	%	3.522E-01	9.56E-02	G
		964.00	4.391E-03	&	8.600E-01	2.48E-01	G
		1112.07	3.969E-01	(	4.442E-01	1.48E-01	G
		778.90	-1.032E-01	%	5.471E-01	1.59E-01	G
EU-154	-9.1881E-03						
		123.10	-9.188E-03	%(	1.189E-01	3.53E-02	G K
		1274.80	0.000E+00	%	3.721E-01	1.06E-01	G
		723.30	-1.007E-01	%	3.882E-01	1.14E-01	G
		1004.80	-7.193E-03	%	4.161E-01	1.16E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	2.0532E-01						
		86.45	2.053E-01	(	2.054E-01	6.36E-02	G K
		105.31	1.322E-01	%	2.438E-01	7.42E-02	G
HG-203	1.8874E-02						
		279.17	1.887E-02	%(P	7.629E-02	2.26E-02	G K
		72.87	-4.783E-01	%	1.878E+00	5.65E-01	G
		70.83	-1.945E-01	%	3.243E+00	9.67E-01	G
		82.50	-1.361E+00	%	3.951E+00	1.19E+00	G
TL-208	3.4405E-01						
		583.14	3.426E-01	(	5.578E-02	2.87E-02	G
		510.72	3.497E-01	*(	2.790E-01	9.16E-02	G
PB-212	7.0661E-01						
							Energy duplication
		238.63	7.066E-01	(	1.288E-01	4.96E-02	G K
							Energy duplication
		77.11	9.868E-01	+	4.270E-01	1.39E-01	G
		74.81	1.049E+00	&	8.623E-01	2.69E-01	G
PB-214	6.3898E-01						
		351.99	6.535E-01	(	1.114E-01	5.08E-02	G K
		295.22	6.109E-01	(	2.616E-01	9.05E-02	G
							Energy duplication
		77.11	1.614E+00	+	6.983E-01	2.27E-01	G
		241.92	5.359E-01	%	8.781E-01	2.68E-01	G
BI-212	9.4068E-01						
		727.17	9.407E-01	(	5.545E-01	2.33E-01	G K
		1620.56	9.630E-01	%	1.010E+00	4.08E-01	G
		785.42	3.165E-01	%	2.847E+00	8.04E-01	G
BI-214	7.0270E-01						
		609.32	7.225E-01	(	1.440E-01	7.29E-02	G K
		1764.51	6.453E-01	?(	1.815E-01	1.26E-01	G
		1120.28	1.070E+00	+	5.648E-01	2.58E-01	G
RA-224	1.6751E+00						
		241.00	1.675E+00	(	1.555E+00	4.87E-01	G
RA-226	1.9084E+00						
		185.99	1.908E+00	*(	1.472E+00	4.67E-01	G
AC-228	9.9879E-01						
		911.07	9.401E-01	(	2.383E-01	1.21E-01	G K
		968.90	1.651E+00	+	4.770E-01	2.44E-01	G
		338.40	1.141E+00	(	4.596E-01	1.96E-01	G

Yankee Chemistry Spectrum name: 101F_23DEC2004_1350.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-7.7791E-02						
		236.00	-7.779E-02	%(	4.934E-01	1.47E-01	G K
		256.25	-1.314E-01	%	7.216E-01	2.14E-01	G
PA-234	-4.7370E-03						
		98.44	-4.737E-03	&(	2.352E-01	6.99E-02	G K
		946.00	-1.505E-03	&	3.277E-01	9.02E-02	G
		131.28	-4.157E-02	%	2.820E-01	8.43E-02	G
		94.67	3.328E-03	&	4.046E-01	1.20E-01	G
		883.24	-5.248E-03	%	5.981E-01	1.67E-01	G
		926.70	1.430E-01	&	5.609E-01	1.63E-01	G
		569.26	2.178E-01	%	4.899E-01	1.48E-01	G
TH-234	1.9063E+00						
		63.29	1.218E+00	%(	2.643E+00	8.01E-01	G K
		92.80	2.230E+00	(	2.058E+00	6.40E-01	G
		92.38	2.573E+00	(	2.445E+00	7.59E-01	G
AM-241	-5.5901E-03						
		59.54	-5.590E-03	%(P	3.681E-01	1.09E-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	1.3396E-01	1.6707E-01	5.0620E-01	5.0629E-01	4.580E-01
K-40		1.7394E+01	1.7394E+01	2.2991E+00	2.5003E+00	
MN-54	#A	-3.5817E-03	-3.7196E-03	5.1765E-02	5.1766E-02	5.951E-02
CO-57	#B	-1.0830E-02	-1.1314E-02	6.4488E-02	6.4491E-02	6.050E-02
CO-60	#B	6.9180E-03	6.9605E-03	6.0867E-02	6.0869E-02	7.784E-02
Sr-85	#A	-1.6122E-02	-1.9338E-02	7.4478E-02	7.4486E-02	7.003E-02
Kr-85	#A	-3.7268E+02	-3.7273E+02	1.4337E+03	1.4339E+03	1.617E+03
Y-88	#B	-1.0100E-03	-1.1281E-03	6.7687E-03	6.7690E-03	3.018E-02
NB-94	#B	6.3479E-03	6.3479E-03	4.7741E-02	4.7742E-02	5.674E-02
Ag-108M	#B	-1.6818E-02	-1.6822E-02	6.8679E-02	6.8686E-02	7.832E-02
CD-109	#A	6.3202E-02	6.4868E-02	1.7414E+00	1.7414E+00	1.897E+00
SN-113	#B	-4.2147E-03	-4.6695E-03	2.1389E-01	2.1389E-01	8.704E-02
SB-125	#F	1.7110E-01	1.7311E-01	1.5614E-01	1.5645E-01	1.444E-01
I-131	#B	1.7238E-02	7.4749E-02	2.2821E-01	2.2825E-01	5.901E-02
CS-134	#B	1.6427E-03	1.6687E-03	1.4012E-01	1.4012E-01	1.556E-01
CS-137	#A	1.9194E-02	1.9215E-02	6.1427E-02	6.1436E-02	6.958E-02
CE-139	#A	1.1005E-02	1.1991E-02	5.9223E-02	5.9227E-02	6.076E-02
EU-152	#B	1.1301E-01	1.1329E-01	1.2642E-01	1.2658E-01	1.783E-01
EU-154	#B	-9.1532E-03	-9.1881E-03	1.0585E-01	1.0585E-01	1.184E-01
EU-155	#A	2.0399E-01	2.0532E-01	1.9092E-01	1.9126E-01	2.041E-01
HG-203	#B	1.4653E-02	1.8874E-02	6.7661E-02	6.7670E-02	5.923E-02
TL-208	#	3.4405E-01	3.4405E-01	8.6337E-02	8.8499E-02	5.578E-02
PB-212	#	7.0661E-01	7.0661E-01	1.4881E-01	1.5408E-01	1.288E-01
PB-214	#	6.3898E-01	6.3898E-01	1.4907E-01	1.5338E-01	1.114E-01
BI-212	#	9.4068E-01	9.4068E-01	6.9911E-01	7.0112E-01	
BI-214		7.0270E-01	7.0270E-01	2.1276E-01	2.1643E-01	
RA-224	#	1.6751E+00	1.6751E+00	1.4615E+00	1.4646E+00	1.555E+00
RA-226	#	1.9084E+00	1.9084E+00	1.4021E+00	1.4063E+00	1.472E+00
AC-228		9.9879E-01	9.9879E-01	3.2140E-01	3.2631E-01	
TH-227	#B	-7.7791E-02	-7.7791E-02	4.3996E-01	4.3998E-01	4.934E-01
PA-234	#B	-4.7370E-03	-4.7370E-03	2.0963E-01	2.0963E-01	2.352E-01
TH-234	#B	1.9063E+00	1.9063E+00	1.4786E+00	1.4824E+00	2.643E+00
AM-241	#A	-5.5897E-03	-5.5901E-03	4.3884E-01	4.3884E-01	3.681E-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

Yankee Chemistry Spectrum name: 101F_23DEC2004_1350.An1

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

Total Activity (270.1 to 1999.1 keV) 2.0036304E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 2.0036304E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 107_22DEC2004_1106.An1

Sample description
FSS-OOL-04-01-024-F

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\107_22DEC2004_1106.An1

Acquisition information
Start time: 22-Dec-2004 11:06:58
Live time: 2000
Real time: 2002
Dead time: 0.08 %
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: 9.8800E+02
Activity scaling factor: 1.0000E+06/(1.0000E+00* 9.8800E+02) =
1.0121E+03
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 107_22DEC2004_1106.An1

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	06-Dec-2004 11:55:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	150000_BKG_107.Pbc □□□□□□□19□□ □□□□□□□□
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 20 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0977

***** 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
74.42	222.	14.74	1.18	2.842E-02				
74.42	222.	14.74	1.18	2.842E-02	74.81	9.600	1.109E+00	PB212
77.25	390.	8.29	1.18	2.974E-02	77.11	10.700	1.684E+00	PB214
					77.11	17.500	1.030E+00	PB212
93.20	108.	31.95	1.39	3.447E-02	92.38	2.570	1.670E+00	TH234
					92.80	3.000	1.427E+00	TH234
185.93	192.	16.75	1.39	3.611E-02	185.99	3.280	2.220E+00	RA226
209.38	64.	35.04	1.42	3.428E-02				
238.72	724.	4.33	1.30	3.189E-02	238.63	43.100	7.202E-01	PB212
242.08	193.	13.27	1.30	3.162E-02	241.00	3.900	2.133E+00	RA224
					241.92	7.470	1.116E+00	PB214
270.22	86.	28.45	1.90	2.945E-02				
295.34	250.	8.48	1.34	2.766E-02	295.22	19.200	6.426E-01	PB214
300.04	43.	36.09	1.34	2.735E-02				
338.33	175.	16.42	1.32	2.501E-02	338.40	12.010	7.980E-01	AC228
351.94	511.	5.75	1.48	2.426E-02				
351.94	511.	5.75	1.48	2.426E-02	351.99	37.100	7.772E-01	PB214
463.22	78.	27.75	1.58	1.954E-02				
463.22	78.	27.75	1.58	1.954E-02	463.51	10.000	5.502E-01	SB125
511.05	117.	19.28	1.39	1.807E-02	510.72	22.500	3.947E-01	TL208
583.22	247.	7.83	1.63	1.629E-02	583.14	86.000	2.412E-01	TL208
609.28	430.	6.14	1.34	1.574E-02	609.32	46.090	8.097E-01	BI214
661.66	117.	18.43	0.82	1.477E-02	661.62	84.620	1.282E-01	CS137
727.14	102.	17.49	1.25	1.374E-02	727.17	11.800	8.645E-01	BI212
910.93	176.	12.64	1.91	1.161E-02	911.07	29.000	7.151E-01	AC228
968.63	155.	15.39	1.98	1.109E-02	968.90	17.460	1.095E+00	AC228

1065.74	27.	36.85	0.65	1.034E-02				
1119.67	105.	17.02	1.94	9.974E-03	1120.28	15.040	9.605E-01	BI214
1237.76	38.	39.05	0.75	9.265E-03				
1460.49	1002.	3.26	1.98	8.192E-03	1460.75	10.700	1.565E+01	K40
1763.99	63.	12.60	1.33	7.084E-03	1764.51	15.920	7.641E-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	
148.51	74.67	424.	222.	0.111	44.23	1.177	BI-207	D
154.16	77.49	326.	390.	0.195	24.86	1.179	PB-214	D
418.40	209.38	209.	64.	0.032	105.12	1.418	AC-228	
477.07	238.71	129.	724.	0.362	12.99	1.297	PB-212	D
483.80	242.07	231.	193.	0.096	39.82	1.299	PB-214	D
540.07	270.22	202.	86.	0.043	85.35	1.896	AC-228	s
599.84	300.11	121.	53.	0.026	101.55	1.526	PB-212	s
2131.05	1065.74	27.	27.	0.013	110.54	0.648	-	s
2475.08	1237.76	67.	38.	0.019	117.16	0.747	J-133	s

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

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
HG-203	145.82	73.08	954.	-108.	-0.054	124.19	1.500s
PB-212	149.46	74.90	916.	240.	0.120	56.82	1.500s
PB-214	153.89	77.11	820.	340.	0.170	39.22	1.500D
PB-212	153.89	77.11	820.	340.	0.170	39.22	1.500D
TH-234	185.83	93.08	705.	154.	0.077	76.96	1.500
RA-226	371.51	185.93	325.	192.	0.096	50.26	1.393s
PB-212	477.05	238.71	487.	642.	0.321	18.77	1.500s
RA-224	483.37	241.87	536.	149.	0.074	70.48	1.500
PB-214	484.00	242.18	610.	111.	0.055	98.72	1.500
PB-214	590.31	295.34	156.	253.	0.127	28.17	1.500
AC-228	676.27	338.33	198.	175.	0.088	49.27	1.320s
PB-214	703.59	351.99	103.	499.	0.250	15.95	1.500
SB-125	925.37	462.88	78.	55.	0.028	78.61	1.500
TL-208	1021.69	511.05	120.	117.	0.059	57.83	1.389s
TL-208	1166.02	583.22	51.	247.	0.123	23.50	1.629
BI-214	1218.14	609.28	80.	430.	0.215	18.42	1.341
CS-137	1322.90	661.66	87.	117.	0.058	55.29	0.824s
BI-212	1453.86	727.14	62.	102.	0.051	52.46	1.252s
AC-228	1821.41	910.93	84.	176.	0.088	37.93	1.913
AC-228	1936.82	968.63	90.	155.	0.078	46.17	1.979
BI-214	2238.91	1119.67	53.	105.	0.053	51.07	1.940s

Yankee Chemistry Spectrum name: 107_22DEC2004_1106.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
K-40	2920.58	1460.49	16.	1002.	0.501	9.77	1.979
BI-214	3527.64	1763.99	0.	63.	0.032	37.80	1.333s

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

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

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		-9.3151E-02					
			477.56	-9.315E-02	%(	4.427E-01 1.30E-01	G
K-40		1.5645E+01					
			1460.75	1.565E+01	(	3.286E-01 5.09E-01	G
MN-54		-2.2894E-03					
			834.81	-2.289E-03	%(	3.464E-02 9.71E-03	G
CO-57		-1.5334E-02					
			122.07	-1.533E-02	%(	4.829E-02 1.45E-02	G K
			136.43	-1.592E-01	%	3.280E-01 9.95E-02	G
CO-60		6.9304E-05					
			1332.51	6.930E-05	&(	3.302E-02 8.74E-03	G K
			1173.23	1.051E-03	%	5.236E-02 1.48E-02	G K
Sr-85		-2.0414E-02					
			514.00	-2.041E-02	&(	5.793E-02 1.74E-02	G
Kr-85		-3.9737E+02					
			513.99	-3.974E+02	&(	1.128E+03 3.38E+02	G
Y-88		3.8482E-03					
			1836.01	3.848E-03	&(	3.377E-02 8.91E-03	G K
			898.02	8.343E-03	&	4.755E-02 1.37E-02	G
NB-94		-9.1127E-04					
			871.10	-9.113E-04	%(	3.460E-02 9.62E-03	G K
			702.50	-5.434E-03	&	4.070E-02 1.18E-02	G K
Ag-108M		-1.6778E-02					
			722.95	-1.678E-02	%(	5.765E-02 1.71E-02	G K
			614.37	-2.361E-02	%	5.298E-02 1.60E-02	G
			433.93	2.300E-03	&	3.279E-02 9.43E-03	G

Yankee Chemistry Spectrum name: 107_22DEC2004_1106.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	1.5147E-01						
		88.04	1.515E-01	%(	1.518E+00	4.53E-01	G
SN-113	1.8262E-02						
		391.71	1.826E-02	%(	4.982E-02	1.49E-02	G K
		255.04	-5.571E-01	%	1.835E+00	5.50E-01	G
SB-125	9.6748E-02						
		427.95	-3.164E-03	&(	1.135E-01	3.27E-02	G K
		600.77	-5.618E-02	%	2.159E-01	6.37E-02	G
		636.15	2.210E-03	%	2.578E-01	7.17E-02	G
		463.51	3.925E-01	(	3.102E-01	1.03E-01	G
		176.29	4.756E-03	%	4.580E-01	1.34E-01	G
I-131	6.0882E-02						
		364.48	6.088E-02	&(	1.495E-01	4.50E-02	G K
		636.97	-4.525E-01	%	1.706E+00	5.00E-01	G
		284.29	2.993E-01	%	2.102E+00	6.20E-01	G
CS-134	1.9814E-03						
		604.66	1.981E-03	%(	1.264E-01	3.77E-02	G K
		795.76	1.513E-03	%	4.072E-02	1.14E-02	G
		569.29	-3.828E-02	&	2.294E-01	6.67E-02	G
		801.84	-1.466E-01	%	4.677E-01	1.38E-01	G
CS-137	1.2816E-01						
		661.62	1.282E-01	(	5.058E-02	2.36E-02	G
CE-139	-7.8717E-03						
		165.85	-7.872E-03	&(	4.987E-02	1.49E-02	G
EU-152	-4.4444E-02						
		121.78	-4.444E-02	%(	1.362E-01	4.10E-02	G K
		344.30	-1.562E-02	%	1.222E-01	3.58E-02	G
		1408.08	0.000E+00	&	2.803E-01	7.87E-02	G
		964.00	1.417E-01	&	3.817E-01	1.14E-01	G
		1112.07	-1.190E-01	%	4.518E-01	1.33E-01	G
		778.90	-1.534E-02	&	2.441E-01	6.84E-02	G
EU-154	-4.7557E-03						
		123.10	-4.756E-03	%(	9.700E-02	2.88E-02	G K
		1274.80	-3.374E-02	%	1.587E-01	4.63E-02	G
		723.30	-2.094E-02	%	2.562E-01	7.43E-02	G
		1004.80	1.405E-02	%	2.242E-01	6.29E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	4.4778E-02						
		86.45	4.478E-02	&(	1.442E-01	4.34E-02	G K
		105.31	-9.075E-03	&	1.923E-01	5.71E-02	G
HG-203	-1.2880E-02						
		279.17	-1.288E-02	%(	5.948E-02	1.77E-02	G K
		72.87	-4.386E-01	%	1.660E+00	5.00E-01	G
		70.83	-2.037E+00	&	2.754E+00	8.43E-01	G
		82.50	-5.367E-01	%	3.054E+00	9.14E-01	G
TL-208	2.4115E-01						
		583.14	2.412E-01	(	3.514E-02	1.89E-02	G
		510.72	3.947E-01	+	1.805E-01	7.61E-02	G
PB-212	6.3918E-01						
		238.63	6.392E-01	@(	1.050E-01	4.00E-02	G K
							Energy duplication
		77.11	8.996E-01	+	3.598E-01	1.18E-01	G
		74.81	1.201E+00	+	7.186E-01	2.28E-01	G
PB-214	7.5880E-01						
		351.99	7.588E-01	(	7.590E-02	4.03E-02	G K
		295.22	6.517E-01	-	1.568E-01	6.12E-02	G
							Energy duplication
		77.11	1.471E+00	+	5.884E-01	1.92E-01	G
		241.92	6.416E-01	&	6.818E-01	2.11E-01	G
BI-212	8.6453E-01						
		727.17	8.645E-01	*(	3.336E-01	1.51E-01	G K
		1620.56	-1.793E-01	%	1.207E+00	3.31E-01	G
		785.42	4.452E-01	%	2.012E+00	5.87E-01	G
BI-214	7.9797E-01						
		609.32	8.097E-01	(	8.393E-02	4.97E-02	G K
		1764.51	7.641E-01	(	8.939E-02	9.62E-02	G
		1120.28	9.605E-01	+	3.333E-01	1.63E-01	G
RA-224	1.6455E+00						
		241.00	1.646E+00	&(	1.224E+00	3.87E-01	G
RA-226	2.2201E+00						
		185.99	2.220E+00	*(	1.001E+00	3.72E-01	G
AC-228	7.3938E-01						
		911.07	7.151E-01	(	1.845E-01	9.04E-02	G K
		968.90	1.095E+00	+	3.314E-01	1.68E-01	G
		338.40	7.980E-01	@(	3.109E-01	1.31E-01	G

Yankee Chemistry Spectrum name: 107_22DEC2004_1106.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-2.0368E-01						
		236.00	-2.037E-01	%(	4.420E-01	1.34E-01	G K
		256.25	7.372E-02	%	4.950E-01	1.46E-01	G
PA-234	-1.6360E-03						
		98.44	-1.636E-03	&(	1.755E-01	5.20E-02	G K
		946.00	7.422E-03	%	2.087E-01	5.87E-02	G
		131.28	2.598E-03	&	1.962E-01	5.81E-02	G
		94.67	-1.206E-01	%	3.404E-01	1.03E-01	G
		883.24	2.480E-02	%	3.482E-01	9.90E-02	G
		926.70	-5.429E-02	%	3.690E-01	1.06E-01	G
		569.26	-3.350E-02	&	3.405E-01	9.82E-02	G
TH-234	1.1187E+00						
		63.29	4.062E-01	%(	2.142E+00	6.41E-01	G K
		92.80	2.045E+00	(	1.677E+00	5.25E-01	G
		92.38	-2.313E-01	%	2.050E+00	6.12E-01	G
AM-241	-1.0387E-01						
		59.54	-1.039E-01	%(	2.935E-01	8.85E-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

Yankee Chemistry Spectrum name: 107_22DEC2004_1106.An1

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	-7.5715E-02	-9.3151E-02	3.9124E-01	3.9128E-01	3.599E-01
K-40		1.5645E+01	1.5645E+01	1.5286E+00	1.7862E+00	
MN-54	#A	-2.2097E-03	-2.2894E-03	2.9122E-02	2.9123E-02	3.343E-02
CO-57	#B	-1.4718E-02	-1.5334E-02	4.3582E-02	4.3590E-02	4.635E-02
CO-60	#B	6.8907E-05	6.9304E-05	2.6209E-02	2.6209E-02	3.283E-02
Sr-85	#A	-1.7211E-02	-2.0414E-02	5.2123E-02	5.2137E-02	4.884E-02
Kr-85	#A	-3.9732E+02	-3.9737E+02	1.0146E+03	1.0149E+03	1.127E+03
Y-88	#B	3.4687E-03	3.8482E-03	2.6740E-02	2.6741E-02	3.044E-02
NB-94	#B	-9.1127E-04	-9.1127E-04	2.8851E-02	2.8851E-02	3.460E-02
Ag-108M	#B	-1.6774E-02	-1.6778E-02	5.1423E-02	5.1432E-02	5.764E-02
CD-109	#A	1.4782E-01	1.5147E-01	1.3603E+00	1.3603E+00	1.481E+00
SN-113	#B	1.6588E-02	1.8262E-02	4.4739E-02	4.4752E-02	4.525E-02
SB-125	#B	9.5696E-02	9.6748E-02	7.6053E-02	7.6267E-02	1.122E-01
I-131	#B	1.5370E-02	6.0882E-02	1.3497E-01	1.3501E-01	3.773E-02
CS-134	#B	1.9525E-03	1.9814E-03	1.1296E-01	1.1296E-01	1.246E-01
CS-137		1.2803E-01	1.2816E-01	7.0861E-02	7.1264E-02	
CE-139	#A	-7.2629E-03	-7.8717E-03	4.4581E-02	4.4584E-02	4.602E-02
EU-152	#B	-4.4338E-02	-4.4444E-02	1.2299E-01	1.2302E-01	1.359E-01
EU-154	#B	-4.7388E-03	-4.7557E-03	8.6327E-02	8.6327E-02	9.665E-02
EU-155	#B	4.4505E-02	4.4778E-02	1.3011E-01	1.3014E-01	1.433E-01
HG-203	#B	-1.0157E-02	-1.2880E-02	5.3142E-02	5.3148E-02	4.690E-02
TL-208		2.4115E-01	2.4115E-01	5.6681E-02	5.8443E-02	
PB-212	#	6.3918E-01	6.3918E-01	1.1997E-01	1.2577E-01	1.050E-01
PB-214	#	7.5880E-01	7.5880E-01	1.2104E-01	1.2907E-01	7.590E-02
BI-212	#	8.6453E-01	8.6453E-01	4.5352E-01	4.5639E-01	
BI-214		7.9797E-01	7.9797E-01	1.4696E-01	1.5433E-01	
RA-224	#	1.6455E+00	1.6455E+00	1.1598E+00	1.1638E+00	1.224E+00
RA-226	#	2.2201E+00	2.2201E+00	1.1157E+00	1.1234E+00	
AC-228		7.3938E-01	7.3938E-01	2.2987E-01	2.3399E-01	
TH-227	#B	-2.0368E-01	-2.0368E-01	4.0176E-01	4.0194E-01	4.420E-01
PA-234	#B	-1.6360E-03	-1.6360E-03	1.5605E-01	1.5605E-01	1.755E-01
TH-234	#B	1.1187E+00	1.1187E+00	8.6093E-01	8.6316E-01	2.142E+00
AM-241	#A	-1.0386E-01	-1.0387E-01	2.6561E-01	2.6568E-01	2.935E-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

Yankee Chemistry Spectrum name: 107_22DEC2004_1106.An1

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

Total Activity (270.2 to 2000.1 keV) 2.0636183E+01 pCi/gm
Total Decayed Activity (270.2 to 2000.1 keV) 2.0636353E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 107F_21DEC2004_1024.An1

Sample description
FSS-OOL-04-01-014-F

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\107F_21DEC2004_1024.An1

Acquisition information
Start time: 22-Dec-2004 10:25:12
Live time: 2000
Real time: 2002
Dead time: 0.11 %
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: 1.3340E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.3340E+03) =
7.4963E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 107F_21DEC2004_1024.An1

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	06-Dec-2004 11:31:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	150000_BKG_107.Pbc □□□□□□□19□□ □□□□□□□□
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 19 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0869

***** 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	301.	18.83	1.50	2.849E-02				
74.85	301.	18.83	1.50	2.849E-02	74.81	9.600	1.115E+00	PB212
77.08	475.	11.63	1.50	2.957E-02	77.11	10.700	1.522E+00	PB214
					77.11	17.500	9.304E-01	PB212
77.08	475.	11.63	1.50	2.957E-02	77.11	10.700	1.522E+00	PB214
					77.11	17.500	9.304E-01	PB212
83.79	90.	36.15	1.18	3.205E-02				
88.22	107.	34.49	1.19	3.331E-02	86.45	32.740	1.010E-01	EU155
90.00	162.	20.42	1.19	3.375E-02				
93.67	173.	19.52	1.19	3.456E-02	92.80	3.000	1.698E+00	TH234
128.85	100.	31.65	1.22	3.818E-02				
186.03	208.	18.93	0.83	3.610E-02	185.99	3.280	1.779E+00	RA226
209.15	126.	27.77	1.12	3.430E-02				
238.70	1209.	3.31	1.30	3.189E-02	238.63	43.100	8.906E-01	PB212
241.76	211.	14.31	1.30	3.165E-02	241.00	3.900	1.727E+00	RA224
					241.92	7.470	9.036E-01	PB214
270.23	121.	28.82	0.86	2.945E-02				
295.26	372.	6.93	1.34	2.768E-02				
295.26	372.	6.93	1.34	2.768E-02	295.22	19.200	7.089E-01	PB214
300.36	58.	32.97	1.34	2.734E-02				
327.44	81.	27.63	1.29	2.564E-02				
338.59	276.	12.37	1.55	2.499E-02	338.40	12.010	9.321E-01	AC228
351.97	641.	5.40	1.44	2.426E-02				
351.97	641.	5.40	1.44	2.426E-02	351.99	37.100	7.217E-01	PB214
462.79	50.	33.18	1.50	1.953E-02	463.51	10.000	PBC<MDA	SB125
511.28	210.	13.87	1.98	1.807E-02	510.72	22.500	5.234E-01	TL208

583.05	389.	7.01	1.52	1.629E-02	583.14	86.000	2.813E-01	TL208
609.15	426.	7.01	1.58	1.575E-02	609.32	46.090	5.945E-01	BI214
661.43	99.	23.78	1.23	1.477E-02	661.62	84.620	8.032E-02	CS137
727.55	120.	18.57	1.53	1.374E-02	727.17	11.800	7.521E-01	BI212
795.35	72.	24.53	1.35	1.284E-02				
795.35	72.	24.53	1.35	1.284E-02	795.76	85.400	6.788E-02	CS134
860.13	69.	25.38	1.76	1.211E-02				
911.02	261.	8.41	1.55	1.161E-02	911.07	29.000	7.854E-01	AC228
933.92	47.	36.36	1.05	1.140E-02				
967.70	232.	8.99	1.74	1.110E-02	968.90	17.460	1.211E+00	AC228
1120.20	154.	17.43	1.74	9.970E-03	1120.28	15.040	1.038E+00	BI214
1460.43	1420.	2.72	2.31	8.192E-03	1460.75	10.700	1.641E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1763.50	107.	9.67	2.64	7.084E-03	1764.51	15.920	9.612E-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	
179.66	90.00	468.	162.	0.081	61.27	1.189	PB-214	lD
257.35	128.85	444.	107.	0.053	88.69	1.220	AC-228	
417.94	209.15	461.	126.	0.063	83.30	1.123	AC-228	s
477.05	238.63	197.	1207.	0.603	9.95	1.297	PB-212	D
540.08	270.23	376.	121.	0.060	86.45	0.856	AC-228	s
600.07	300.22	254.	66.	0.033	109.74	0.978	PB-212	s
654.50	327.44	185.	81.	0.041	82.90	1.290	AC-228	
1719.82	860.13	75.	69.	0.035	76.15	1.755	TL-208	s
1867.41	933.92	80.	47.	0.024	91.40	1.046	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
HG-203	146.10	73.22	1430.	-147.	-0.073	112.23	1.500s
PB-212	149.36	74.85	1455.	301.	0.151	56.48	1.500s
PB-214	153.89	77.11	1291.	475.	0.238	34.89	1.500D
PB-212	153.89	77.11	1291.	475.	0.238	34.89	1.500D
HG-203	171.04	85.69	1086.	-128.	-0.064	112.05	1.500s
EU-155	174.23	87.28	1248.	138.	0.069	111.82	1.500
TH-234	185.97	93.15	1097.	192.	0.096	76.41	1.500
RA-226	371.70	186.03	537.	208.	0.104	56.79	0.833
TH-227	472.00	236.18	1020.	-145.	-0.072	97.03	1.500s
PB-212	476.89	238.63	681.	1114.	0.557	13.40	1.500D
RA-224	481.63	241.00	1117.	193.	0.096	76.69	1.299D
PB-214	590.12	295.25	306.	351.	0.176	26.50	1.500
AC-228	676.79	338.59	288.	276.	0.138	37.11	1.547
PB-214	703.46	351.92	191.	622.	0.311	15.28	1.500
SB-125	925.18	462.79	114.	50.	0.025	99.55	1.500s
TL-208	1022.15	511.28	173.	210.	0.105	41.60	1.975s
TL-208	1165.68	583.05	118.	389.	0.194	21.02	1.520
BI-214	1217.88	609.15	145.	426.	0.213	21.02	1.585
CS-137	1322.53	661.48	132.	128.	0.064	58.36	1.257

Yankee Chemistry Spectrum name: 107F_21DEC2004_1024.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	1454.68	727.55	103.	120.	0.060	55.72	1.529s
CS-134	1589.59	795.01	61.	54.	0.027	74.19	1.684
AC-228	1821.60	911.02	76.	261.	0.131	25.22	1.547
AC-228	1934.97	967.70	58.	232.	0.116	26.96	1.743s
BI-214	2239.96	1120.20	122.	154.	0.077	52.29	1.736s
K-40	2920.45	1460.43	17.	1420.	0.710	8.15	2.310
BI-214	3526.65	1763.50	0.	107.	0.054	29.00	2.642s

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		1.0579E-03					
			477.56	1.058E-03	&(	3.803E-01 1.10E-01	G
K-40		1.6408E+01					
			1460.75	1.641E+01	(	2.560E-01 4.46E-01	G
MN-54		1.1051E-02					
			834.81	1.105E-02	%(	3.801E-02 1.13E-02	G
CO-57		1.3844E-03					
			122.07	1.384E-03	%(	4.233E-02 1.26E-02	G K
			136.43	2.043E-02	&	2.825E-01 8.39E-02	G
CO-60		8.7722E-03					
			1332.51	8.772E-03	%(	3.717E-02 1.08E-02	G K
			1173.23	1.360E-02	%	4.924E-02 1.46E-02	G K
Sr-85		-1.5700E-02					
			514.00	-1.570E-02	&(	5.090E-02 1.52E-02	G
Kr-85		-3.0549E+02					
			513.99	-3.055E+02	&(	9.910E+02 2.97E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	3.734E-02 9.98E-03	G K
			898.02	1.699E-02	%	4.666E-02 1.40E-02	G
NB-94		-1.1098E-03					
			871.10	-1.110E-03	%(	2.801E-02 7.87E-03	G K
			702.50	9.765E-03	&	3.122E-02 9.27E-03	G K

Yankee Chemistry Spectrum name: 107F_21DEC2004_1024.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	4.2233E-04						
		722.95	4.223E-04	&(	3.560E-02	1.02E-02	G K
		614.37	2.908E-04	&	3.522E-02	1.01E-02	G
		433.93	3.535E-03	%	3.405E-02	9.98E-03	G
CD-109	7.2281E-01						
		88.04	7.228E-01	%(	1.323E+00	4.02E-01	G
SN-113	7.6023E-03						
		391.71	7.602E-03	&(	5.035E-02	1.48E-02	G K
		255.04	7.615E-02	%	1.496E+00	4.41E-01	G
SB-125	6.7368E-02						
		427.95	1.169E-03	&(	1.066E-01	3.10E-02	G K
		600.77	5.149E-02	%	1.742E-01	5.17E-02	G
		636.15	3.124E-02	%	2.345E-01	6.76E-02	G
		463.51	2.633E-01	(	2.748E-01	8.74E-02	G
		176.29	2.286E-04	&	5.440E-01	1.61E-01	G
I-131	3.2545E-02						
		364.48	3.254E-02	&(	1.260E-01	3.75E-02	G K
		636.97	3.487E-01	%	1.554E+00	4.56E-01	G
		284.29	-2.576E-01	&	1.997E+00	5.92E-01	G
CS-134	-3.0531E-02						
		604.66	-3.053E-02	&(	4.972E-02	1.52E-02	G K
		795.76	5.023E-02	+	3.666E-02	1.24E-02	G
		569.29	-7.952E-04	%	1.985E-01	5.70E-02	G
		801.84	-7.907E-02	&	4.178E-01	1.22E-01	G
CS-137	1.0360E-01						
		661.62	1.036E-01	(	4.568E-02	2.02E-02	G
CE-139	1.5868E-02						
		165.85	1.587E-02	%(	4.210E-02	1.27E-02	G
EU-152	1.2094E-02						
		121.78	1.209E-02	%(	1.190E-01	3.55E-02	G K
		344.30	-3.078E-02	%	1.168E-01	3.49E-02	G
		1408.08	8.663E-02	%	1.484E-01	4.60E-02	G
		964.00	3.954E-02	&	2.350E-01	6.80E-02	G
		1112.07	-3.556E-02	%	3.052E-01	8.80E-02	G
		778.90	-4.298E-02	&	2.669E-01	7.77E-02	G
EU-154	-1.2462E-02						
		123.10	-1.246E-02	%(	8.836E-02	2.64E-02	G K
		1274.80	0.000E+00	%	1.698E-01	4.89E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	-8.757E-02	&	2.372E-01	7.13E-02	G
		1004.80	7.865E-02	&	1.492E-01	4.57E-02	G
EU-155	1.3053E-01						
		86.45	1.305E-01	(	1.586E-01	4.87E-02	G K
		105.31	4.866E-02	%	1.811E-01	5.45E-02	G
HG-203	-1.1652E-03						
		279.17	-1.165E-03	&(	4.498E-02	1.32E-02	G K
		72.87	-8.969E-01	%	1.525E+00	4.64E-01	G
		70.83	-2.038E+00	&	2.487E+00	7.62E-01	G
		82.50	-2.327E+00	&	2.832E+00	8.69E-01	G
TL-208	2.8128E-01						
		583.14	2.813E-01	(	3.856E-02	1.97E-02	G
		510.72	5.234E-01	+	1.593E-01	7.26E-02	G
PB-212	8.5274E-01						
							Energy duplication
		238.63	8.212E-01	@(	9.160E-02	3.67E-02	G K
							Energy duplication
		77.11	9.304E-01	@(	3.330E-01	1.08E-01	G
		74.81	1.115E+00	+	6.683E-01	2.10E-01	G
PB-214	6.9000E-01						
		351.99	7.006E-01	(	7.556E-02	3.57E-02	G K
		295.22	6.696E-01	(	1.605E-01	5.92E-02	G
							Energy duplication
		77.11	1.522E+00	+	5.446E-01	1.77E-01	G
		241.92	3.145E-01	%	6.292E-01	1.91E-01	G
BI-212	7.5211E-01						
		727.17	7.521E-01	*(	3.118E-01	1.40E-01	G K
		1620.56	-1.277E-02	%	9.245E-01	2.42E-01	G
		785.42	7.340E-01	%	1.618E+00	4.89E-01	G
BI-214	5.9450E-01						
		609.32	5.945E-01	(	8.218E-02	4.17E-02	G K
		1764.51	9.612E-01	+	6.620E-02	9.29E-02	G
		1120.28	1.038E+00	+	3.666E-01	1.81E-01	G
RA-224	1.5790E+00						
		241.00	1.579E+00	(	1.298E+00	4.04E-01	G
RA-226	1.7794E+00						
		185.99	1.779E+00	(	9.470E-01	3.37E-01	G
AC-228	8.2837E-01						
		911.07	7.854E-01	(	1.304E-01	6.60E-02	G K
		968.90	1.211E+00	+	1.990E-01	1.09E-01	G
		338.40	9.321E-01	(	2.758E-01	1.15E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-4.0717E-01						
		236.00	-4.072E-01	?(	4.270E-01	1.32E-01	G K
		256.25	4.717E-03	%	3.752E-01	1.10E-01	G
PA-234	-2.5529E-02						
		98.44	-2.553E-02	%(	1.501E-01	4.49E-02	G K
		946.00	-4.965E-02	%	2.039E-01	6.01E-02	G
		131.28	-2.183E-02	%	1.892E-01	5.66E-02	G
		94.67	-5.338E-03	%	2.649E-01	7.89E-02	G
		883.24	-1.525E-03	%	2.939E-01	8.34E-02	G
		926.70	6.584E-02	%	3.147E-01	9.18E-02	G
		569.26	-6.304E-02	%	2.990E-01	8.81E-02	G
TH-234	1.3896E+00						
		63.29	1.010E+00	%(	2.030E+00	6.16E-01	G K
		92.80	1.884E+00	(	1.543E+00	4.80E-01	G
		92.38	-3.059E-01	&	1.892E+00	5.68E-01	G
AM-241	-1.7238E-02						
		59.54	-1.724E-02	&(	2.718E-01	8.12E-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	8.6005E-04	1.0579E-03	3.3067E-01	3.3067E-01	3.092E-01
K-40		1.6408E+01	1.6408E+01	1.3373E+00	1.6515E+00	
MN-54	#A	1.0666E-02	1.1051E-02	3.3789E-02	3.3796E-02	3.669E-02
CO-57	#B	1.3289E-03	1.3844E-03	3.7786E-02	3.7786E-02	4.063E-02
CO-60	#B	8.7219E-03	8.7722E-03	3.2419E-02	3.2423E-02	3.695E-02
Sr-85	#A	-1.3238E-02	-1.5700E-02	4.5737E-02	4.5746E-02	4.292E-02
Kr-85	#A	-3.0545E+02	-3.0549E+02	8.9038E+02	8.9057E+02	9.909E+02
Y-88	#B	0.0000E+00	0.0000E+00	2.9934E-02	2.9934E-02	3.366E-02
NB-94	#B	-1.1098E-03	-1.1098E-03	2.3598E-02	2.3598E-02	2.801E-02
Ag-108M	#B	4.2223E-04	4.2233E-04	3.0461E-02	3.0461E-02	3.559E-02
CD-109	#A	7.0539E-01	7.2281E-01	1.2067E+00	1.2074E+00	1.291E+00
SN-113	#B	6.9059E-03	7.6023E-03	4.4526E-02	4.4528E-02	4.574E-02
SB-125	#B	6.6636E-02	6.7368E-02	6.7067E-02	6.7185E-02	1.055E-01
I-131	#B	8.2248E-03	3.2545E-02	1.1236E-01	1.1238E-01	3.185E-02
CS-134	#B	-3.0086E-02	-3.0531E-02	4.5673E-02	4.5709E-02	4.900E-02
CS-137		1.0349E-01	1.0360E-01	6.0464E-02	6.0773E-02	
CE-139	#A	1.4642E-02	1.5868E-02	3.8118E-02	3.8129E-02	3.885E-02
EU-152	#B	1.2066E-02	1.2094E-02	1.0651E-01	1.0652E-01	1.187E-01
EU-154	#B	-1.2418E-02	-1.2462E-02	7.9287E-02	7.9290E-02	8.805E-02
EU-155	#A	1.2974E-01	1.3053E-01	1.4596E-01	1.4614E-01	1.577E-01
HG-203	#B	-9.1902E-04	-1.1652E-03	3.9674E-02	3.9674E-02	3.548E-02
TL-208		2.8128E-01	2.8128E-01	5.9130E-02	6.1420E-02	
PB-212	#	8.5274E-01	8.5274E-01	1.1423E-01	1.2484E-01	9.160E-02
PB-214	#	6.9000E-01	6.9000E-01	1.0541E-01	1.1302E-01	7.556E-02
BI-212	#	7.5211E-01	7.5211E-01	4.1906E-01	4.2140E-01	
BI-214		5.9450E-01	5.9450E-01	1.2499E-01	1.2983E-01	
RA-224		1.5790E+00	1.5790E+00	1.2109E+00	1.2145E+00	
RA-226		1.7794E+00	1.7794E+00	1.0106E+00	1.0160E+00	
AC-228		8.2837E-01	8.2837E-01	1.8584E-01	1.9217E-01	
TH-227	#A	-4.0717E-01	-4.0717E-01	3.9508E-01	3.9581E-01	4.270E-01
PA-234	#B	-2.5529E-02	-2.5529E-02	1.3482E-01	1.3483E-01	1.501E-01
TH-234	#B	1.3896E+00	1.3896E+00	1.0618E+00	1.0646E+00	2.030E+00
AM-241	#A	-1.7237E-02	-1.7238E-02	2.4370E-01	2.4370E-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

Yankee Chemistry Spectrum name: 107F_21DEC2004_1024.An1

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

Total Activity (270.2 to 2000.1 keV) 2.2326319E+01 pCi/gm
Total Decayed Activity (270.2 to 2000.1 keV) 2.2326454E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

YAEC Chemistry Lab Spectrum name: 101_2AUG2006_0902.An1

Sample description
OOL-04-04-015-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\101_2AUG2006_0902.An1

Acquisition information
Start time: 02-Aug-2006 09:03:04
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: 1.7470E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7470E+03) =
5.7241E+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	01-Aug-2006 14:55:00
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: 0.5229

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.73	153.	27.40	1.50	1.654E-02	74.81	9.600	7.453E-01	PB212
77.14	240.	17.50	1.50	1.720E-02	77.11	10.700	1.007E+00	PB214
					77.11	17.500	6.154E-01	PB212
77.14	243.	17.50	1.50	1.720E-02	77.11	10.700	1.007E+00	PB214
					77.11	17.500	6.250E-01	PB212
87.47	80.	41.39	0.86	1.924E-02	86.45	32.740	9.901E-02	EU155
					88.04	3.790	PBC<MDA	CD109
93.14	125.	27.10	1.15	1.993E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.25	73.	33.24	0.98	1.857E-02	185.99	3.280	9.239E-01	RA226
239.01	651.	4.50	1.12	1.556E-02	238.63	43.100	7.432E-01	PB212
241.83	87.	27.05	1.12	1.541E-02	241.00	3.900	1.103E+00	RA224
242.94	57.	18.54	1.50	1.545E-02	241.00	3.900	7.307E-01	RA224
270.45	70.	31.81	0.83	1.399E-02				
295.53	127.	18.42	1.21	1.291E-02	295.22	19.200	3.905E-01	PB214
339.01	168.	13.49	1.25	1.133E-02	338.40	12.010	9.427E-01	AC228
352.41	236.	11.61	1.28	1.091E-02	351.99	37.100	4.466E-01	PB214
463.69	29.	40.33	1.50	8.342E-03	463.51	10.000	PBC<MDA	SB125
511.70	88.	19.81	1.61	7.576E-03	510.72	22.500	3.260E-01	TL208
583.59	186.	10.02	1.22	6.680E-03	583.14	86.000	2.478E-01	TL208
609.82	170.	11.38	1.28	6.408E-03	609.32	46.090	4.420E-01	BI214
662.27	38.	33.85	1.26	5.932E-03	661.62	84.620	PBC<MDA	CS137
727.79	25.	38.81	1.50	5.443E-03	727.17	11.800	PBC<MDA	BI212
768.57	31.	35.75	0.70	5.176E-03				
912.04	161.	10.28	1.25	4.442E-03	911.07	29.000	9.546E-01	AC228
965.63	31.	24.54	1.61	4.224E-03				
969.90	63.	17.27	1.62	4.208E-03	968.90	17.460	6.563E-01	AC228

1120.22	59.	25.06	2.33	3.711E-03	1120.28	15.040	8.124E-01	BI214
1462.13	520.	4.52	1.71	2.940E-03	1460.75	10.700	1.273E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1765.78	37.	16.44	1.52	2.481E-03	1764.51	15.920	7.159E-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	
477.72	238.95	104.	651.	0.326	13.50	1.122	PB-212	D
483.36	241.77	231.	87.	0.043	81.16	1.124	PB-214	D
540.62	270.45	165.	70.	0.035	95.43	0.831	AC-228	s
1537.33	768.57	34.	31.	0.015	107.24	0.698	BI-214	s
1931.83	965.71	14.	31.	0.015	74.37	1.614	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	149.02	74.73	866.	153.	0.076	82.21	1.499
PB-214	153.79	77.11	788.	240.	0.120	52.50	1.499D
PB-212	153.79	77.11	784.	243.	0.122	52.50	1.499D
EU-155	174.13	87.28	689.	105.	0.053	109.77	1.499
TH-234	185.68	93.05	666.	165.	0.083	67.56	1.499
RA-226	372.27	186.31	393.	75.	0.038	117.02	1.499s
PB-212	477.60	238.95	338.	465.	0.233	21.45	1.499
RA-224	485.58	242.94	29.	57.	0.028	55.62	1.499
PB-214	591.02	295.64	178.	120.	0.060	53.48	1.499
AC-228	677.81	339.01	122.	166.	0.083	40.47	1.252
PB-214	704.59	352.39	120.	201.	0.101	30.99	1.499
TL-208	1023.35	511.70	88.	72.	0.036	59.44	1.613s
TL-208	1167.20	583.59	55.	184.	0.092	30.06	1.219
BI-214	1219.67	609.82	52.	169.	0.084	34.13	1.283
CS-137	1324.61	662.26	56.	29.	0.014	119.16	1.499
BI-212	1455.73	727.79	36.	25.	0.012	116.44	1.499s
AC-228	1824.42	912.04	29.	163.	0.082	30.04	1.251
AC-228	1938.21	968.90	57.	37.	0.018	98.09	1.616D
BI-214	2241.03	1120.22	42.	59.	0.029	75.18	2.332s
K-40	2925.27	1462.13	11.	518.	0.259	13.57	1.708
BI-214	3533.00	1765.78	0.	37.	0.018	49.32	1.520

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		1.2178E-01					
			477.56	1.218E-01	%(	3.705E-01 1.10E-01	G
K-40		1.2727E+01					
			1460.75	1.273E+01	(P	4.460E-01 5.79E-01	G
MN-54		1.5475E-02					
			834.81	1.547E-02	&(P	4.222E-02 1.25E-02	G
CO-57		2.8942E-03					
			122.07	2.894E-03	&(	4.716E-02 1.40E-02	G K
			136.43	-6.845E-02	&	3.645E-01 1.09E-01	G
CO-60		-4.5130E-04					
			1332.51	-4.513E-04	&(P	5.732E-02 1.54E-02	G K
			1173.23	-3.450E-03	% P	6.568E-02 1.83E-02	G K
Sr-85		-1.6065E-02					
			514.00	-1.607E-02	&(	5.629E-02 1.67E-02	G
Kr-85		-3.9598E+02					
			513.99	-3.960E+02	&(P	1.295E+03 3.83E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	2.411E-02 3.27E-03	G K
			898.02	-7.486E-03	% P	5.120E-02 1.44E-02	G
NB-94		9.6877E-03					
			871.10	9.688E-03	&(P	4.158E-02 1.19E-02	G K
			702.50	-6.120E-05	% P	5.422E-02 1.53E-02	G K
Ag-108M		1.9091E-03					
			722.95	1.909E-03	%(	5.014E-02 1.40E-02	G K
			614.37	-8.804E-03	& P	5.332E-02 1.54E-02	G
			433.93	1.564E-02	%	3.767E-02 1.13E-02	G
CD-109		-7.2492E-02					
			88.04	-7.249E-02	%(P	1.513E+00 4.51E-01	G
SN-113		-4.2682E-03					
			391.71	-4.268E-03	&(	7.029E-02 2.04E-02	G K
			255.04	1.969E-01	% P	1.816E+00 5.35E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-9.4466E-04						
		427.95	-9.447E-04	%(P	1.434E-01	4.11E-02	G K
		600.77	5.419E-03	% P	2.356E-01	6.64E-02	G
		636.15	5.490E-02	% P	3.956E-01	1.13E-01	G
		463.51	2.732E-01	% P	3.700E-01	1.16E-01	G
		176.29	1.425E-01	% P	6.043E-01	1.80E-01	G
I-131	7.7804E-03						
		364.48	7.780E-03	%(	4.748E-02	1.39E-02	G K
		636.97	1.932E-01	%	6.626E-01	1.95E-01	G
		284.29	5.227E-03	%	6.581E-01	1.91E-01	G
CS-134	-1.1452E-02						
		604.66	-1.145E-02	%(P	4.347E-02	1.26E-02	G K
		795.76	3.647E-02	% P	5.716E-02	1.78E-02	G
		569.29	4.182E-02	& P	2.927E-01	8.45E-02	G
		801.84	-8.529E-02	%	5.764E-01	1.65E-01	G
CS-137	4.4595E-02						
		661.62	4.459E-02	(P	5.798E-02	1.83E-02	G
CE-139	-1.7334E-03						
		165.85	-1.733E-03	&(P	4.741E-02	1.40E-02	G
EU-152	-1.6073E-02						
		121.78	-1.607E-02	&(P	1.396E-01	4.15E-02	G K
		344.30	-4.551E-02	% P	1.517E-01	4.51E-02	G
		1408.08	7.669E-02	% P	2.564E-01	7.42E-02	G
		964.00	-1.322E-01	& P	4.709E-01	1.38E-01	G
		1112.07	-3.881E-03	% P	4.099E-01	1.12E-01	G
		778.90	-2.642E-02	% P	3.286E-01	9.16E-02	G
EU-154	1.8924E-03						
		123.10	1.892E-03	&(P	9.095E-02	2.69E-02	G K
		1274.80	7.462E-02	% P	1.673E-01	5.05E-02	G
		723.30	1.380E-03	% P	2.092E-01	5.75E-02	G
		1004.80	-2.465E-02	& P	3.301E-01	9.26E-02	G
EU-155	1.3029E-01						
		86.45	1.303E-01	(	1.548E-01	4.77E-02	G K
		105.31	4.731E-02	%	1.463E-01	4.39E-02	G
HG-203	3.7560E-03						
		279.17	3.756E-03	&(	4.713E-02	1.38E-02	G K
		72.87	-2.866E-01	% P	1.173E+00	3.52E-01	G
		70.83	4.830E-03	&	2.021E+00	6.01E-01	G
		82.50	3.250E-04	%	2.381E+00	7.07E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.4775E-01						
		583.14	2.478E-01	(P	5.010E-02	2.52E-02	G
		510.72	3.260E-01	+ P	2.103E-01	7.91E-02	G
PB-212	5.6172E-01						
		238.63	5.360E-01	(P	1.019E-01	3.88E-02	G K
							Energy duplication
		77.11	6.250E-01	(	3.423E-01	1.09E-01	G
		74.81	7.453E-01	& P	6.814E-01	2.11E-01	G
PB-214	3.8095E-01						
		351.99	3.838E-01	(P	1.028E-01	4.00E-02	G K
		295.22	3.755E-01	(P	2.023E-01	6.79E-02	G
							Energy duplication
		77.11	1.007E+00	+ P	5.611E-01	1.79E-01	G
		241.92	1.921E-01	% P	4.545E-01	1.37E-01	G
BI-212	2.9603E-01						
		727.17	2.960E-01	(P	3.699E-01	1.18E-01	G K
		1620.56	4.584E-01	%	1.488E+00	4.26E-01	G
		785.42	1.859E-02	& P	2.293E+00	6.33E-01	G
BI-214	4.4202E-01						
		609.32	4.420E-01	(P	9.513E-02	5.06E-02	G K
		1764.51	7.159E-01	+ P	1.443E-01	1.19E-01	G
		1120.28	8.124E-01	+ P	4.580E-01	2.05E-01	G
RA-224	7.3066E-01						
		241.00	7.307E-01	(P	3.569E-01	1.37E-01	G
RA-226	9.5436E-01						
		185.99	9.544E-01	(	1.206E+00	3.72E-01	G
AC-228	9.6807E-01						
		911.07	9.786E-01	(P	1.664E-01	9.92E-02	G K
		968.90	3.871E-01	- P	3.992E-01	1.29E-01	G
		338.40	9.427E-01	(P	3.073E-01	1.29E-01	G
TH-227	3.3080E-03						
		236.00	3.308E-03	&(P	3.705E-01	1.09E-01	G K
		256.25	-4.902E-02	& P	5.706E-01	1.67E-01	G
PA-234	-5.3632E-02						
		98.44	-5.363E-02	&(	1.594E-01	4.80E-02	G K
		946.00	4.756E-02	&	2.442E-01	6.98E-02	G
		131.28	3.831E-02	%	2.100E-01	6.28E-02	G
		94.67	-1.105E-01	%	3.184E-01	9.60E-02	G
		883.24	0.000E+00	%	4.831E-01	1.35E-01	G
		926.70	-2.892E-02	&	5.199E-01	1.46E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 5.983E-02 &   4.379E-01 1.27E-01 G

TH-234       1.3250E+00
                           63.29 6.968E-01 %(P 2.120E+00 6.36E-01 G K
                           92.80 2.142E+00  (P 1.593E+00 5.00E-01 G
                           92.38-1.485E-01 % P 1.930E+00 5.69E-01 G

AM-241      -1.0167E-01
                           59.54-1.017E-01 %(P 2.686E-01 8.09E-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	1.2059E-01	1.2178E-01	3.3014E-01	3.3021E-01	3.669E-01
K-40		1.2727E+01	1.2727E+01	1.7352E+00	1.8783E+00	
MN-54	#A	1.5449E-02	1.5475E-02	3.7446E-02	3.7456E-02	4.215E-02
CO-57	#B	2.8886E-03	2.8942E-03	4.2011E-02	4.2011E-02	4.707E-02
CO-60	#B	-4.5118E-04	-4.5130E-04	1.2668E-01	1.2668E-01	5.731E-02

Sr-85	#A	-1.5936E-02	-1.6065E-02	5.0205E-02	5.0213E-02	5.584E-02
Kr-85	#A	-3.9598E+02	-3.9598E+02	1.3250E+03	1.3252E+03	1.295E+03
Y-88	#B	0.0000E+00	0.0000E+00	9.8142E-03	9.8159E-03	2.399E-02
NB-94	#B	9.6877E-03	9.6877E-03	3.5778E-02	3.5782E-02	4.158E-02
Ag-108M	#B	1.9091E-03	1.9091E-03	4.2119E-02	4.2119E-02	5.014E-02
CD-109	#A	-7.2408E-02	-7.2492E-02	1.5523E+00	1.5524E+00	1.511E+00
SN-113	#B	-4.2488E-03	-4.2682E-03	6.1345E-02	6.1345E-02	6.997E-02
SB-125	#B	-9.4417E-04	-9.4466E-04	8.0334E-02	8.0334E-02	1.434E-01
I-131	#B	7.2897E-03	7.7804E-03	4.1673E-02	4.1675E-02	4.449E-02
CS-134	#B	-1.1444E-02	-1.1452E-02	4.3293E-02	4.3298E-02	4.344E-02
CS-137	#A	4.4593E-02	4.4595E-02	5.4759E-02	5.4817E-02	5.797E-02
CE-139	#A	-1.7268E-03	-1.7334E-03	5.0626E-02	5.0626E-02	4.723E-02
EU-152	#B	-1.6072E-02	-1.6073E-02	1.4077E-01	1.4077E-01	1.396E-01
EU-154	#B	1.8921E-03	1.8924E-03	8.0627E-02	8.0627E-02	9.093E-02
EU-155	#A	1.3025E-01	1.3029E-01	1.4301E-01	1.4320E-01	1.547E-01
HG-203	#B	3.7140E-03	3.7560E-03	4.1461E-02	4.1461E-02	4.661E-02
TL-208		2.4775E-01	2.4775E-01	7.5440E-02	7.6727E-02	
PB-212	#	5.6172E-01	5.6172E-01	1.2210E-01	1.2616E-01	1.019E-01
PB-214	#	3.8095E-01	3.8095E-01	1.1922E-01	1.2115E-01	1.028E-01
BI-212	#A	2.9603E-01	2.9603E-01	3.5420E-01	3.5460E-01	3.699E-01
BI-214		4.4202E-01	4.4202E-01	1.5184E-01	1.5388E-01	
RA-224		7.3066E-01	7.3066E-01	4.1152E-01	4.1358E-01	3.569E-01
RA-226	#A	9.5436E-01	9.5436E-01	1.1168E+00	1.1181E+00	1.206E+00
AC-228		9.6807E-01	9.6807E-01	2.4702E-01	2.5300E-01	
TH-227	#B	3.3080E-03	3.3080E-03	3.2658E-01	3.2658E-01	3.705E-01
PA-234	#B	-5.3632E-02	-5.3632E-02	1.4393E-01	1.4396E-01	1.594E-01
TH-234	#B	1.3250E+00	1.3250E+00	9.2867E-01	9.3157E-01	2.120E+00
AM-241	#A	-1.0167E-01	-1.0167E-01	2.5362E-01	2.5368E-01	2.686E-01

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

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

Total Activity (1120.2 to 1999.1 keV) 1.5115541E+01 pCi/gm
Total Decayed Activity (1120.2 to 1999.1 keV) 1.5115541E+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_3AUG2006_1339.An1

Sample description
FSS-OOL-04-04-016-F

Spectrum Filename: C:\GammaVision\Spectra\101F_3AUG2006_1339.An1

Acquisition information

Start time:	03-Aug-2006 13:39:19
Live time:	2000
Real time:	2001
Dead time:	0.06 %
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:	1.1990E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.1990E+03) = 8.3403E+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	01-Aug-2006 15:20:00
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: 0.4201

***** 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	120.	27.54	1.50	1.654E-02	74.81	9.600	8.511E-01	PB212
77.20	159.	21.56	1.50	1.720E-02	77.11	17.500	5.961E-01	PB212
					77.11	10.700	9.521E-01	PB214
77.20	156.	21.56	1.50	1.720E-02	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	9.521E-01	PB214
87.74	98.	25.95	1.02	1.928E-02				
93.58	86.	36.38	1.40	1.997E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	3.133E-01	PA234
186.54	70.	29.84	1.00	1.855E-02	185.99	3.280	1.287E+00	RA226
209.49	56.	29.05	0.89	1.720E-02				
239.11	490.	6.72	1.10	1.555E-02	238.63	43.100	8.124E-01	PB212
					241.92	7.470	4.794E+00	PB214
295.75	94.	14.70	1.16	1.290E-02	295.22	19.200	4.198E-01	PB214
300.39	28.	41.56	1.16	1.271E-02				
338.75	85.	17.61	1.31	1.134E-02	338.40	12.010	6.814E-01	AC228
352.38	184.	10.47	1.19	1.091E-02	351.99	37.100	5.062E-01	PB214
511.40	89.	15.66	1.23	7.581E-03	510.72	22.500	4.829E-01	TL208
583.67	111.	12.72	1.24	6.679E-03	583.14	86.000	2.122E-01	TL208
609.88	137.	12.22	0.88	6.407E-03	609.32	46.090	5.193E-01	BI214
662.16	111.	11.22	1.19	5.933E-03	661.62	84.620	2.466E-01	CS137
727.87	29.	30.93	1.50	5.443E-03	727.17	11.800	5.151E-01	BI212
912.03	74.	17.01	1.70	4.442E-03	911.07	29.000	6.340E-01	AC228
969.42	63.	22.84	1.90	4.210E-03	968.90	17.460	9.545E-01	AC228
1462.06	348.	5.43	2.16	2.940E-03	1460.75	10.700	1.239E+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	
418.64	209.49	112.	56.	0.028	87.15	0.887	AC-228	
477.93	239.11	599.	89.	0.045	120.87	1.103	PB-212	
600.53	300.39	54.	28.	0.014	124.69	1.165	PB-212	lD
2243.16	1121.29	24.	39.	0.019	83.36	1.468	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-212	149.12	74.77	537.	120.	0.060	82.63	1.499
PB-212	153.79	77.11	510.	159.	0.080	64.69	1.499D
PB-214	153.79	77.11	514.	156.	0.078	64.69	1.499D
TH-234	185.74	93.08	427.	109.	0.055	80.55	1.499s
RA-226	372.64	186.49	243.	66.	0.033	106.99	1.499s
PB-212	477.69	239.00	213.	362.	0.181	22.78	1.499
PB-214	591.24	295.75	109.	96.	0.048	54.37	1.499
AC-228	677.29	338.75	65.	82.	0.041	52.82	1.313
PB-214	704.62	352.41	71.	158.	0.079	32.43	1.499
TL-208	1022.75	511.40	54.	73.	0.037	46.97	1.230s
TL-208	1167.36	583.67	39.	108.	0.054	38.16	1.237
BI-214	1219.80	609.88	45.	136.	0.068	36.66	0.883s
CS-137	1324.40	662.16	19.	110.	0.055	33.65	1.190s
BI-212	1455.89	727.87	29.	29.	0.015	92.79	1.499s
AC-228	1824.42	912.03	32.	73.	0.036	51.02	1.696s
AC-228	1939.25	969.42	37.	62.	0.031	68.51	1.904
K-40	2925.15	1462.06	5.	346.	0.173	16.30	2.156

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		1.8596E-01					
			477.56	1.860E-01	%(	4.936E-01 1.47E-01	G
K-40		1.2387E+01					
			1460.75	1.239E+01	(P	4.693E-01 6.78E-01	G
MN-54		4.5314E-03					
			834.81	4.531E-03	%(P	5.967E-02 1.64E-02	G
CO-57		4.5534E-04					
			122.07	4.553E-04	%(	5.837E-02 1.72E-02	G K
			136.43	1.204E-01	%	3.978E-01 1.19E-01	G
CO-60		-3.0646E-04					
			1332.51	-3.065E-04	%(P	7.361E-02 1.94E-02	G K
			1173.23	-4.753E-04	% P	1.108E-01 3.10E-02	G K
Sr-85		-1.5989E-02					
			514.00	-1.599E-02	%(	6.963E-02 2.05E-02	G
Kr-85		-4.0243E+02					
			513.99	-4.024E+02	%(P	1.585E+03 4.63E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	1.072E-01 2.86E-02	G K
			898.02	-1.195E-02	% P	6.636E-02 1.87E-02	G
NB-94		3.6834E-03					
			871.10	3.683E-03	%(P	4.870E-02 1.31E-02	G K
			702.50	7.556E-04	& P	5.636E-02 1.55E-02	G K
Ag-108M		1.3070E-02					
			722.95	1.307E-02	%(	6.220E-02 1.79E-02	G K
			614.37	-2.592E-02	% P	7.290E-02 2.17E-02	G
			433.93	-1.167E-02	%	5.651E-02 1.65E-02	G
CD-109		-9.0453E-01					
			88.04	-9.045E-01	%(P	1.630E+00 4.96E-01	G
SN-113		2.3125E-03					
			391.71	2.312E-03	&(	7.244E-02 2.06E-02	G K
			255.04	9.815E-01	& P	1.626E+00 5.00E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-5.8767E-03						
		427.95	-5.877E-03	%(P	1.977E-01	5.66E-02	G K
		600.77	-5.474E-02	% P	2.907E-01	8.32E-02	G
		636.15	1.153E-01	& P	3.857E-01	1.12E-01	G
		463.51	3.338E-01	% P	5.031E-01	1.56E-01	G
		176.29	-1.426E-01	% P	7.550E-01	2.23E-01	G
I-131	2.2325E-02						
		364.48	2.232E-02	%(	5.327E-02	1.60E-02	G K
		636.97	-1.153E-01	%	9.047E-01	2.57E-01	G
		284.29	-7.162E-02	&	8.697E-01	2.53E-01	G
CS-134	-1.8324E-04						
		604.66	-1.832E-04	%(P	6.554E-02	1.84E-02	G K
		795.76	3.326E-02	% P	5.107E-02	1.62E-02	G
		569.29	-4.329E-02	& P	3.106E-01	8.73E-02	G
		801.84	2.773E-02	&	6.373E-01	1.74E-01	G
CS-137	2.4660E-01						
		661.62	2.466E-01	*(P	5.175E-02	2.79E-02	G
CE-139	4.2862E-03						
		165.85	4.286E-03	&(P	5.185E-02	1.52E-02	G
EU-152	8.3455E-03						
		121.78	8.346E-03	&(P	1.686E-01	4.98E-02	G K
		344.30	3.555E-02	% P	1.815E-01	5.32E-02	G
		1408.08	-3.675E-02	% P	2.941E-01	7.80E-02	G
		964.00	-3.213E-02	& P	5.493E-01	1.52E-01	G
		1112.07	-2.528E-02	% P	5.391E-01	1.47E-01	G
		778.90	1.314E-01	% P	3.461E-01	1.02E-01	G
EU-154	7.2571E-04						
		123.10	7.257E-04	&(P	1.108E-01	3.25E-02	G K
		1274.80	4.379E-02	& P	2.049E-01	5.80E-02	G
		723.30	7.334E-03	% P	5.230E-01	1.50E-01	G
		1004.80	4.659E-02	& P	3.358E-01	9.29E-02	G
EU-155	-6.7154E-02						
		86.45	-6.715E-02	%(	1.975E-01	5.95E-02	G K
		105.31	2.156E-03	%	2.159E-01	6.35E-02	G
HG-203	8.9677E-04						
		279.17	8.968E-04	%(	5.495E-02	1.58E-02	G K
		72.87	-3.832E-01	% P	1.364E+00	4.09E-01	G
		70.83	-2.263E-02	%	2.388E+00	7.07E-01	G
		82.50	9.196E-01	%	2.819E+00	8.48E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.1218E-01						
		583.14	2.122E-01	(P	6.220E-02	2.76E-02	G
		510.72	4.829E-01	+ P	2.435E-01	9.23E-02	G
PB-212	6.0434E-01						
		238.63	6.077E-01	(P	1.186E-01	4.69E-02	G K
							Energy duplication
		77.11	5.961E-01	(	4.040E-01	1.29E-01	G
		74.81	8.511E-01	& P	7.856E-01	2.45E-01	G
PB-214	4.3699E-01						
		351.99	4.383E-01	(P	1.167E-01	4.80E-02	G K
		295.22	4.345E-01	(P	2.333E-01	8.02E-02	G
							Energy duplication
		77.11	9.521E-01	+ P	6.632E-01	2.10E-01	G
		241.92	-5.098E-02	% P	8.196E-01	2.41E-01	G
BI-212	5.1506E-01						
		727.17	5.151E-01	@(P	4.864E-01	1.63E-01	G K
		1620.56	-1.878E-01	%	2.625E+00	6.92E-01	G
		785.42	-1.448E-01	& P	3.824E+00	1.07E+00	G
BI-214	5.1934E-01						
		609.32	5.193E-01	(P	1.293E-01	6.40E-02	G K
		1764.51	-1.132E-01	& P	4.975E-01	1.36E-01	G
		1120.28	1.091E-03	% P	5.186E-01	1.40E-01	G
RA-224	6.0156E-01						
		241.00	6.016E-01	%(P	1.336E+00	4.04E-01	G
RA-226	1.2177E+00						
		185.99	1.218E+00	(	1.393E+00	4.34E-01	G
AC-228	7.3943E-01						
		911.07	6.340E-01	@(P	2.558E-01	1.11E-01	G K
		968.90	9.545E-01	(P	4.743E-01	2.21E-01	G
		338.40	6.814E-01	(P	3.321E-01	1.23E-01	G
TH-227	-1.5360E-01						
		236.00	-1.536E-01	%(P	5.471E-01	1.64E-01	G K
		256.25	-1.329E-01	& P	7.062E-01	2.08E-01	G
PA-234	-1.0740E-01						
		98.44	-1.074E-01	%(	2.073E-01	6.30E-02	G K
		946.00	-1.210E-02	&	3.476E-01	9.55E-02	G
		131.28	-3.103E-02	%	2.425E-01	7.20E-02	G
		94.67	-3.855E-03	%	3.679E-01	1.09E-01	G
		883.24	1.084E-01	%	4.696E-01	1.34E-01	G
		926.70	-2.410E-02	&	6.300E-01	1.74E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-5.729E-02 &   4.571E-01 1.29E-01 G

TH-234       1.4951E+00
                           63.29 1.061E+00 %(P 2.577E+00 7.75E-01 G K
                           92.80 2.060E+00 @(P 1.870E+00 5.84E-01 G
                           92.38-1.693E-01 & P 2.431E+00 7.13E-01 G

AM-241       5.0912E-04
                           59.54 5.091E-04 &(P 3.452E-01 1.02E-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	1.8136E-01	1.8596E-01	4.4229E-01	4.4242E-01	4.814E-01
K-40		1.2387E+01	1.2387E+01	2.0328E+00	2.1499E+00	
MN-54	#A	4.5121E-03	4.5314E-03	4.9279E-02	4.9280E-02	5.941E-02
CO-57	#B	4.5309E-04	4.5534E-04	5.1623E-02	5.1623E-02	5.808E-02
CO-60	#B	-3.0624E-04	-3.0646E-04	1.0075E-02	1.0075E-02	7.356E-02

Sr-85	#A	-1.5662E-02	-1.5989E-02	6.1432E-02	6.1439E-02	6.821E-02
Kr-85	#A	-4.0242E+02	-4.0243E+02	1.7034E+03	1.7035E+03	1.585E+03
Y-88	#B	0.0000E+00	0.0000E+00	8.5750E-02	8.5750E-02	1.059E-01
NB-94	#B	3.6834E-03	3.6834E-03	3.9275E-02	3.9275E-02	4.870E-02
Ag-108M	#B	1.3070E-02	1.3070E-02	5.3574E-02	5.3579E-02	6.220E-02
CD-109	#A	-9.0187E-01	-9.0453E-01	1.5118E+00	1.5126E+00	1.625E+00
SN-113	#B	2.2858E-03	2.3125E-03	6.1799E-02	6.1799E-02	7.160E-02
SB-125	#B	-5.8689E-03	-5.8767E-03	2.7378E-01	2.7378E-01	1.975E-01
I-131	#B	1.8902E-02	2.2325E-02	4.8031E-02	4.8047E-02	4.510E-02
CS-134	#B	-1.8292E-04	-1.8324E-04	7.6904E-02	7.6904E-02	6.543E-02
CS-137	#	2.4657E-01	2.4660E-01	8.3654E-02	8.4806E-02	
CE-139	#A	4.2447E-03	4.2862E-03	4.5715E-02	4.5716E-02	5.135E-02
EU-152	#B	8.3431E-03	8.3455E-03	1.4937E-01	1.4937E-01	1.685E-01
EU-154	#B	7.2540E-04	7.2571E-04	9.7575E-02	9.7575E-02	1.107E-01
EU-155	#B	-6.7105E-02	-6.7154E-02	1.7845E-01	1.7848E-01	1.974E-01
HG-203	#B	8.7139E-04	8.9677E-04	4.7539E-02	4.7539E-02	5.340E-02
TL-208		2.1218E-01	2.1218E-01	8.2755E-02	8.3619E-02	
PB-212	#	6.0434E-01	6.0434E-01	1.3999E-01	1.4410E-01	1.186E-01
PB-214	#	4.3699E-01	4.3699E-01	1.4069E-01	1.4284E-01	1.167E-01
BI-212	#	5.1506E-01	5.1506E-01	4.8895E-01	4.8981E-01	4.864E-01
BI-214		5.1934E-01	5.1934E-01	1.9194E-01	1.9417E-01	
RA-224	#A	6.0156E-01	6.0156E-01	1.2115E+00	1.2120E+00	1.336E+00
RA-226	#A	1.2177E+00	1.2177E+00	1.3028E+00	1.3046E+00	1.393E+00
AC-228		7.3943E-01	7.3943E-01	2.5234E-01	2.5577E-01	
TH-227	#B	-1.5360E-01	-1.5360E-01	5.0913E-01	5.0920E-01	5.471E-01
PA-234	#B	-1.0740E-01	-1.0740E-01	1.8901E-01	1.8910E-01	2.073E-01
TH-234	#B	1.4951E+00	1.4951E+00	1.2725E+00	1.2752E+00	2.577E+00
AM-241	#A	5.0912E-04	5.0912E-04	3.0517E-01	3.0517E-01	3.452E-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) 1.4104225E+01 pCi/gm
Total Decayed Activity (50.2 to 1999.1 keV) 1.4104255E+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_3AUG2006_1418.An1

Sample description
FSS-OOL-04-04-008-F

Spectrum Filename: C:\GammaVision\Spectra\101F_3AUG2006_1418.An1

Acquisition information
Start time: 03-Aug-2006 14:18:51
Live time: 2000
Real time: 2002
Dead time: 0.07 %
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: 1.4330E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4330E+03) =
6.9784E+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	01-Aug-2006 15:55:00
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: 0.4832

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.39	153.	20.92	1.00	1.651E-02				
74.39	153.	20.92	1.00	1.651E-02	74.81	9.600	8.784E-01	PB212
77.39	334.	9.32	1.01	1.736E-02	77.11	17.500	1.047E+00	PB212
					77.11	10.700	1.693E+00	PB214
87.06	123.	21.35	1.01	1.918E-02	86.45	32.740	1.858E-01	EU155
90.27	90.	28.85	1.02	1.960E-02				
93.42	159.	16.96	1.02	1.995E-02	92.38	2.570	2.730E+00	TH234
					92.80	3.000	2.408E+00	TH234
185.84	125.	26.76	1.44	1.859E-02				
185.84	125.	26.76	1.44	1.859E-02	185.99	3.280	1.940E+00	RA226
209.78	68.	35.10	0.83	1.719E-02				
239.19	831.	5.23	1.11	1.554E-02	238.63	43.100	1.159E+00	PB212
270.95	94.	21.46	2.01	1.397E-02				
295.60	150.	14.12	1.18	1.290E-02	295.22	19.200	5.616E-01	PB214
300.66	70.	25.99	1.10	1.270E-02				
328.49	41.	35.27	1.06	1.168E-02				
338.71	158.	13.81	1.19	1.134E-02	338.40	12.010	1.076E+00	AC228
352.40	247.	10.87	1.12	1.091E-02	351.99	37.100	5.696E-01	PB214
463.84	58.	27.10	1.25	8.336E-03	463.51	10.000	6.458E-01	SB125
511.30	95.	20.43	1.48	7.582E-03	510.72	22.500	4.361E-01	TL208
583.67	226.	8.30	1.31	6.679E-03	583.14	86.000	3.668E-01	TL208
609.95	202.	10.96	1.48	6.406E-03	609.32	46.090	6.410E-01	BI214
662.16	56.	26.63	1.13	5.933E-03	661.62	84.620	1.042E-01	CS137
727.74	47.	27.54	1.60	5.439E-03	727.17	11.800	6.772E-01	BI212
860.99	45.	26.59	1.71	4.675E-03				
912.19	149.	11.03	1.63	4.442E-03	911.07	29.000	1.077E+00	AC228
967.68	119.	14.27	2.16	4.217E-03	968.90	17.460	1.519E+00	AC228

1121.68	74.	21.94	2.58	3.711E-03	1120.28	15.040	1.257E+00	BI214
1462.08	518.	4.69	2.09	2.940E-03	1460.75	10.700	1.544E+01	K40
1766.56	11.	38.05	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	
148.34	74.72	437.	153.	0.077	62.77	1.005	BI-207	D
154.34	77.72	318.	334.	0.167	27.95	1.007	PB-214	D
173.69	86.99	284.	123.	0.062	64.05	1.014	TB-160	lD
180.13	90.21	295.	90.	0.045	86.54	1.016	PB-214	lD
419.23	209.78	228.	68.	0.034	105.29	0.827	NP-239	s
478.08	239.19	994.	167.	0.084	83.27	1.111	PB-212	
541.62	270.95	132.	94.	0.047	64.37	2.011	AC-228	s
601.08	300.66	113.	70.	0.035	77.97	1.103	PB-212	
656.76	328.49	79.	41.	0.020	105.82	1.063	RH-106M	
1722.27	860.99	30.	45.	0.023	68.13	1.708	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	149.32	74.88	898.	182.	0.091	71.10	1.499s
PB-212	153.79	77.11	782.	283.	0.142	45.52	1.499D
PB-214	153.79	77.11	785.	280.	0.140	45.52	1.499D
TH-234	185.93	93.17	730.	152.	0.076	73.68	1.499s
TH-234	185.88	93.15	673.	172.	0.086	65.48	1.499s
RA-226	372.67	186.51	407.	91.	0.045	99.66	1.499s
PB-212	477.78	239.04	380.	601.	0.300	18.20	1.499
PB-214	591.08	295.66	105.	147.	0.073	38.03	1.499
AC-228	677.20	338.71	119.	156.	0.078	41.43	1.195
PB-214	704.54	352.37	104.	204.	0.102	29.46	1.499
SB-125	927.04	463.57	55.	46.	0.023	77.84	1.499s
TL-208	1022.55	511.30	104.	79.	0.039	61.28	1.476s
TL-208	1167.34	583.67	44.	224.	0.112	24.90	1.312
BI-214	1219.94	609.95	73.	201.	0.100	32.88	1.479
CS-137	1324.40	662.16	55.	56.	0.028	79.90	1.133
BI-212	1455.64	727.74	45.	46.	0.023	82.63	1.599
AC-228	1824.72	912.19	39.	147.	0.074	33.08	1.631s
AC-228	1935.78	967.68	46.	118.	0.059	42.82	2.162s
BI-214	2243.96	1121.68	45.	74.	0.037	65.81	2.577s
K-40	2925.17	1462.08	17.	516.	0.258	14.08	2.092

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3534.56	1766.56	4.	11.	0.005	114.16	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	Peak Code	Peak MDA Value pCi/gm	Peak COMMENTS
BE-7		1.4436E-01					
			477.56	1.444E-01	%(	5.134E-01	1.52E-01 G
K-40		1.5441E+01					
			1460.75	1.544E+01	(P	6.647E-01	7.29E-01 G
MN-54		-1.9634E-02					
			834.81	-1.963E-02	%(P	7.513E-02	2.20E-02 G
CO-57		-4.2100E-03					
			122.07	-4.210E-03	&(	5.900E-02	1.75E-02 G K
			136.43	-1.201E-01	%	4.793E-01	1.44E-01 G
CO-60		1.1397E-02					
			1332.51	1.140E-02	&(P	6.682E-02	1.87E-02 G K
			1173.23	-6.276E-03	% P	8.084E-02	2.27E-02 G K
Sr-85		-2.0534E-02					
			514.00	-2.053E-02	%(	6.909E-02	2.06E-02 G
Kr-85		-4.9856E+02					
			513.99	-4.986E+02	%(P	1.570E+03	4.65E+02 G
Y-88		-6.7185E-03					
			1836.01	-6.718E-03	%(	6.037E-02	1.59E-02 G K
			898.02	-1.275E-03	& P	5.219E-02	1.40E-02 G
NB-94		-1.3188E-02					
			871.10	-1.319E-02	&(P	6.960E-02	2.01E-02 G K
			702.50	5.227E-04	% P	6.054E-02	1.70E-02 G K
Ag-108M		0.0000E+00					
			722.95	0.000E+00	%(	9.204E-02	2.64E-02 G K
			614.37	-7.973E-03	% P	8.829E-02	2.57E-02 G
			433.93	-4.705E-03	%	5.182E-02	1.49E-02 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	3.9931E-01						
		88.04	3.993E-01	%(P	1.503E+00	4.51E-01	G
SN-113	1.2292E-02						
		391.71	1.229E-02	%(	7.337E-02	2.15E-02	G K
		255.04	-4.617E-01	% P	2.409E+00	7.15E-01	G
SB-125	1.6536E-01						
		427.95	4.372E-02	%(P	1.656E-01	4.89E-02	G K
		600.77	-9.667E-02	% P	3.095E-01	9.15E-02	G
		636.15	-8.143E-02	% P	4.875E-01	1.40E-01	G
		463.51	5.254E-01	@(P	4.205E-01	1.41E-01	G
		176.29	2.451E-02	% P	7.259E-01	2.14E-01	G
I-131	8.4808E-03						
		364.48	8.481E-03	%(	6.510E-02	1.90E-02	G K
		636.97	1.234E-02	%	7.635E-01	2.12E-01	G
		284.29	-5.862E-02	%	6.414E-01	1.86E-01	G
CS-134	1.5690E-02						
		604.66	1.569E-02	%(P	4.910E-02	1.45E-02	G K
		795.76	4.260E-02	% P	6.329E-02	1.99E-02	G
		569.29	7.330E-02	% P	3.642E-01	1.06E-01	G
		801.84	-4.971E-02	%	6.232E-01	1.74E-01	G
CS-137	1.0421E-01						
		661.62	1.042E-01	(P	7.025E-02	2.82E-02	G
CE-139	2.4772E-04						
		165.85	2.477E-04	%(P	6.029E-02	1.78E-02	G
EU-152	-1.8834E-02						
		121.78	-1.883E-02	&(P	1.407E-01	4.17E-02	G K
		344.30	-1.564E-02	% P	1.454E-01	4.19E-02	G
		1408.08	-2.601E-03	% P	3.847E-01	1.04E-01	G
		964.00	2.589E-01	% P	6.058E-01	1.82E-01	G
		1112.07	3.377E-03	% P	5.508E-01	1.52E-01	G
		778.90	9.784E-02	% P	3.787E-01	1.10E-01	G
EU-154	-1.5607E-02						
		123.10	-1.561E-02	%(P	1.192E-01	3.55E-02	G K
		1274.80	6.015E-03	& P	1.899E-01	5.15E-02	G
		723.30	-7.348E-02	% P	3.378E-01	9.82E-02	G
		1004.80	-2.873E-02	% P	3.766E-01	1.05E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	2.2496E-02						
		86.45	2.250E-02	%(	2.180E-01	6.52E-02	G K
		105.31	-4.757E-02	&	2.454E-01	7.34E-02	G
HG-203	1.4174E-02						
		279.17	1.417E-02	&(	4.867E-02	1.45E-02	G K
		72.87	-5.524E-01	% P	1.524E+00	4.60E-01	G
		70.83	-2.417E-01	%	2.222E+00	6.63E-01	G
		82.50	-6.245E-01	&	3.158E+00	9.47E-01	G
TL-208	3.8120E-01						
		583.14	3.668E-01	(P	5.537E-02	3.08E-02	G
		510.72	4.361E-01	@(P	2.774E-01	1.07E-01	G
PB-212	8.5637E-01						
		238.63	8.438E-01	(P	1.315E-01	5.17E-02	G K
							Energy duplication
		77.11	8.872E-01	(	4.166E-01	1.35E-01	G
		74.81	1.082E+00	+ P	8.456E-01	2.64E-01	G
PB-214	5.0338E-01						
		351.99	4.748E-01	(P	1.167E-01	4.71E-02	G K
		295.22	5.587E-01	(P	1.919E-01	7.17E-02	G
							Energy duplication
		77.11	1.432E+00	+ P	6.830E-01	2.20E-01	G
		241.92	-2.104E-01	% P	7.858E-01	2.35E-01	G
BI-212	6.7720E-01						
		727.17	6.772E-01	(P	4.982E-01	1.89E-01	G K
		1620.56	-2.963E-01	%	2.168E+00	5.86E-01	G
		785.42	-2.230E-02	% P	3.188E+00	8.89E-01	G
BI-214	6.4097E-01						
		609.32	6.410E-01	(P	1.358E-01	7.07E-02	G K
		1764.51	2.600E-01	- P	2.891E-01	1.03E-01	G
		1120.28	1.257E+00	+ P	5.715E-01	2.78E-01	G
RA-224	8.8003E-01						
		241.00	8.800E-01	%(P	1.631E+00	4.96E-01	G
RA-226	1.4006E+00						
		185.99	1.401E+00	*(	1.496E+00	4.65E-01	G
AC-228	1.0770E+00						
		911.07	1.077E+00	@(P	2.317E-01	1.20E-01	G K
		968.90	1.519E+00	+ P	4.379E-01	2.18E-01	G
		338.40	1.076E+00	(P	3.712E-01	1.51E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-2.3400E-01						
		236.00	-2.340E-01	%(P	5.405E-01	1.63E-01	G K
		256.25	-1.411E-01	% P	7.320E-01	2.17E-01	G
PA-234	-1.2284E-01						
		98.44	-1.228E-01	%(	2.117E-01	6.45E-02	G K
		946.00	0.000E+00	%	4.561E-01	1.29E-01	G
		131.28	7.150E-03	&	2.538E-01	7.53E-02	G
		94.67	-8.108E-02	%	3.591E-01	1.08E-01	G
		883.24	1.145E-02	&	4.534E-01	1.24E-01	G
		926.70	1.240E-03	&	3.983E-01	1.05E-01	G
		569.26	1.145E-01	%	5.377E-01	1.57E-01	G
TH-234	1.9588E+00						
		63.29	8.123E-01	%(P	2.564E+00	7.69E-01	G K
		92.80	2.718E+00	(P	1.954E+00	6.15E-01	G
		92.38	2.812E+00	*(P	2.378E+00	7.40E-01	G
AM-241	-2.5655E-02						
		59.54	-2.566E-02	&(P	3.559E-01	1.06E-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	1.4078E-01	1.4436E-01	4.5563E-01	4.5570E-01	5.006E-01
K-40		1.5441E+01	1.5441E+01	2.1840E+00	2.3518E+00	
MN-54	#A	-1.9550E-02	-1.9634E-02	7.1661E-02	7.1669E-02	7.481E-02
CO-57	#B	-4.1891E-03	-4.2100E-03	5.2616E-02	5.2616E-02	5.871E-02
CO-60	#B	1.1389E-02	1.1397E-02	5.6239E-02	5.6243E-02	6.678E-02
Sr-85	#A	-2.0114E-02	-2.0534E-02	6.1684E-02	6.1695E-02	6.767E-02
Kr-85	#A	-4.9855E+02	-4.9856E+02	1.6004E+03	1.6006E+03	1.570E+03
Y-88	#B	-6.6345E-03	-6.7185E-03	4.7670E-02	4.7672E-02	5.962E-02
NB-94	#B	-1.3188E-02	-1.3188E-02	6.2783E-02	6.2787E-02	6.960E-02
Ag-108M	#B	0.0000E+00	0.0000E+00	7.9094E-02	7.9094E-02	9.203E-02
CD-109	#A	3.9813E-01	3.9931E-01	1.3532E+00	1.3534E+00	1.498E+00
SN-113	#B	1.2150E-02	1.2292E-02	6.4385E-02	6.4389E-02	7.252E-02
SB-125	#B	1.6514E-01	1.6536E-01	1.3272E-01	1.3305E-01	1.653E-01
I-131	#B	7.1789E-03	8.4808E-03	5.6946E-02	5.6948E-02	5.511E-02
CS-134	#B	1.5662E-02	1.5690E-02	4.3366E-02	4.3376E-02	4.901E-02
CS-137		1.0420E-01	1.0421E-01	8.4596E-02	8.4801E-02	
CE-139	#A	2.4531E-04	2.4772E-04	5.3406E-02	5.3406E-02	5.971E-02
EU-152	#B	-1.8828E-02	-1.8834E-02	1.4218E-01	1.4218E-01	1.407E-01
EU-154	#B	-1.5600E-02	-1.5607E-02	1.2108E-01	1.2109E-01	1.192E-01
EU-155	#B	2.2479E-02	2.2496E-02	1.9553E-01	1.9554E-01	2.178E-01
HG-203	#B	1.3772E-02	1.4174E-02	4.3453E-02	4.3461E-02	4.729E-02
TL-208		3.8120E-01	3.8120E-01	9.5945E-02	9.8333E-02	
PB-212	#	8.5637E-01	8.5637E-01	1.5744E-01	1.6471E-01	1.315E-01
PB-214	#	5.0338E-01	5.0338E-01	1.2242E-01	1.2568E-01	1.167E-01
BI-212		6.7720E-01	6.7720E-01	5.6776E-01	5.6905E-01	
BI-214		6.4097E-01	6.4097E-01	2.1188E-01	2.1496E-01	
RA-224	#A	8.8003E-01	8.8003E-01	1.4882E+00	1.4890E+00	1.631E+00
RA-226	#A	1.4006E+00	1.4006E+00	1.3958E+00	1.3980E+00	1.496E+00
AC-228		1.0770E+00	1.0770E+00	2.8937E-01	2.9570E-01	
TH-227	#B	-2.3400E-01	-2.3400E-01	5.0006E-01	5.0023E-01	5.405E-01
PA-234	#B	-1.2284E-01	-1.2284E-01	1.9354E-01	1.9366E-01	2.117E-01
TH-234	#B	1.9588E+00	1.9588E+00	1.3286E+00	1.3330E+00	2.564E+00
AM-241	#A	-2.5655E-02	-2.5655E-02	3.9188E-01	3.9188E-01	3.559E-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 (86.7 to 1999.1 keV) 1.8321489E+01 pCi/gm
Total Decayed Activity (86.7 to 1999.1 keV) 1.8321501E+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_3AUG2006_1458.An1

Sample description
FSS-OOL-04-04-004-F

Spectrum Filename: C:\GammaVision\Spectra\101F_3AUG2006_1458.An1

Acquisition information
Start time: 03-Aug-2006 14:58:45
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: 1.6310E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6310E+03) =
6.1312E+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	01-Aug-2006 15:05:00
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: 0.5286

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.71	212.	15.03	1.00	1.651E-02				
74.71	212.	15.03	1.00	1.651E-02	74.81	9.600	1.077E+00	PB212
77.27	300.	9.78	1.01	1.725E-02	77.11	10.700	1.336E+00	PB214
					77.11	17.500	8.269E-01	PB212
92.97	132.	29.17	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.828E+00	TH234
93.00	127.	29.69	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.18	123.	27.54	1.19	1.857E-02	185.99	3.280	1.675E+00	RA226
239.01	705.	4.30	1.12	1.556E-02	238.63	43.100	8.624E-01	PB212
241.93	116.	16.95	1.12	1.540E-02	241.00	3.900	1.591E+00	RA224
					241.92	7.470	8.335E-01	PB214
270.48	83.	32.70	1.60	1.399E-02				
295.78	139.	12.26	1.16	1.291E-02	295.22	19.200	4.574E-01	PB214
300.57	50.	29.45	1.17	1.271E-02				
338.87	156.	15.19	1.09	1.133E-02	338.40	12.010	9.374E-01	AC228
352.35	266.	9.67	1.29	1.091E-02	351.99	37.100	5.397E-01	PB214
462.80	72.	23.72	1.33	8.354E-03				
462.80	72.	23.72	1.33	8.354E-03	463.51	10.000	6.997E-01	SB125
511.28	111.	19.00	0.94	7.582E-03	510.72	22.500	4.588E-01	TL208
583.61	207.	10.58	1.32	6.679E-03	583.14	86.000	2.943E-01	TL208
609.72	182.	13.05	1.56	6.409E-03	609.32	46.090	5.082E-01	BI214
727.05	71.	21.62	1.47	5.444E-03	723.30	19.700	5.465E-01	EU154
					727.17	11.800	9.123E-01	BI212
795.76	19.	40.36	1.50	5.016E-03	795.76	85.400	PBC<MDA	CS134
912.05	147.	13.21	1.72	4.442E-03	911.07	29.000	9.300E-01	AC228
968.88	107.	15.70	2.26	4.212E-03	968.90	17.460	1.204E+00	AC228

1121.71	38.	28.13	2.03	3.711E-03	1120.28	15.040	5.659E-01	BI214
1462.08	705.	3.87	2.01	2.940E-03	1460.75	10.700	1.850E+01	K40
1766.45	26.	29.51	1.20	2.481E-03	1764.51	15.920	5.424E-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	
148.98	74.72	400.	212.	0.106	45.10	1.005	BI-207	D
154.10	77.28	281.	300.	0.150	29.34	1.007	PB-214	D
477.71	238.96	107.	705.	0.352	12.90	1.122	PB-212	D
483.57	241.89	137.	116.	0.058	50.86	1.124	PB-214	D
540.68	270.48	224.	83.	0.041	98.09	1.600	AC-228	s
600.49	300.37	120.	54.	0.027	99.07	1.034	PB-212	
1022.51	511.28	159.	55.	0.028	104.49	0.939	RH-106M	s
1454.25	727.05	84.	38.	0.019	113.15	1.471	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	149.40	74.91	888.	202.	0.101	64.24	1.499s
PB-214	153.79	77.11	841.	214.	0.107	59.90	1.499D
PB-212	153.79	77.11	837.	218.	0.109	59.90	1.499D
TH-234	185.57	93.00	775.	127.	0.063	89.08	1.499s
TH-234	185.52	92.97	746.	132.	0.066	87.51	1.499s
RA-226	372.45	186.40	410.	89.	0.044	101.64	1.499
PB-212	477.66	238.98	340.	520.	0.260	19.70	1.499
PB-214	483.94	242.12	412.	81.	0.041	109.94	1.499s
PB-214	591.16	295.71	178.	123.	0.062	52.40	1.499
AC-228	677.53	338.87	143.	154.	0.077	45.56	1.086
PB-214	704.52	352.36	129.	232.	0.116	28.31	1.499
SB-125	926.66	463.38	64.	45.	0.023	84.02	1.499s
TL-208	1022.74	511.40	116.	51.	0.025	73.53	1.499s
TL-208	1167.56	583.77	54.	180.	0.090	27.73	1.499
BI-214	1219.38	609.67	78.	159.	0.079	37.80	1.548s
BI-212	1455.76	727.80	64.	35.	0.018	107.02	1.499s
CS-134	1591.74	795.76	21.	19.	0.010	121.09	1.502s
AC-228	1824.46	912.05	56.	145.	0.072	39.63	1.716
AC-228	1938.18	968.88	50.	107.	0.053	47.10	2.262s
BI-214	2244.01	1121.71	32.	38.	0.019	84.38	2.027s
K-40	2925.19	1462.08	12.	703.	0.352	11.61	2.009
BI-214	3534.33	1766.45	9.	26.	0.013	88.53	1.202s

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		-1.3251E-01					
			477.56	-1.325E-01	%(	4.428E-01 1.31E-01	G
K-40		1.8503E+01					
			1460.75	1.850E+01	(P	4.940E-01 7.19E-01	G
MN-54		1.4703E-02					
			834.81	1.470E-02	&(P	4.711E-02 1.38E-02	G
CO-57		9.7939E-03					
			122.07	9.794E-03	%(	5.288E-02 1.58E-02	G K
			136.43	1.605E-01	%	4.006E-01 1.21E-01	G
CO-60		1.4370E-02					
			1332.51	1.437E-02	&(P	6.753E-02 1.93E-02	G K
			1173.23	-9.034E-03	% P	8.257E-02 2.35E-02	G K
Sr-85		-1.2852E-02					
			514.00	-1.285E-02	%(	6.291E-02 1.86E-02	G
Kr-85		-3.2050E+02					
			513.99	-3.205E+02	%(P	1.428E+03 4.19E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	2.603E-02 3.53E-03	G K
			898.02	1.035E-02	& P	4.524E-02 1.29E-02	G
NB-94		-5.1875E-03					
			871.10	-5.188E-03	%(P	5.293E-02 1.49E-02	G K
			702.50	7.777E-03	% P	5.326E-02 1.53E-02	G K
Ag-108M		1.2068E-02					
			722.95	1.207E-02	%(	6.096E-02 1.77E-02	G K
			614.37	-4.572E-03	% P	6.696E-02 1.93E-02	G
			433.93	-1.229E-02	%	4.774E-02 1.41E-02	G
CD-109		2.3384E-01					
			88.04	2.338E-01	%(P	1.575E+00 4.72E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	5.6226E-03						
		391.71	5.623E-03	%(	5.700E-02	1.64E-02	G K
		255.04	-4.493E-03	& P	1.798E+00	5.23E-01	G
SB-125	9.7323E-02						
		427.95	-2.232E-02	%(P	1.549E-01	4.51E-02	G K
		600.77	-5.634E-02	% P	2.693E-01	7.83E-02	G
		636.15	1.648E-01	% P	3.546E-01	1.07E-01	G
		463.51	4.515E-01	*(P	3.980E-01	1.30E-01	G
		176.29	9.846E-02	% P	6.726E-01	2.00E-01	G
I-131	1.6549E-02						
		364.48	1.655E-02	&(	5.130E-02	1.53E-02	G K
		636.97	2.589E-01	%	7.390E-01	2.20E-01	G
		284.29	0.000E+00	%	8.681E-01	2.53E-01	G
CS-134	1.6912E-02						
		604.66	-5.073E-04	%(P	5.101E-02	1.43E-02	G K
		795.76	3.682E-02	(P	4.705E-02	1.52E-02	G
		569.29	3.068E-03	% P	2.954E-01	8.32E-02	G
		801.84	2.300E-03	%	5.706E-01	1.58E-01	G
CS-137	2.2407E-02						
		661.62	2.241E-02	%(P	6.072E-02	1.81E-02	G
CE-139	2.2189E-03						
		165.85	2.219E-03	%(P	4.851E-02	1.43E-02	G
EU-152	-1.4462E-03						
		121.78	-1.446E-03	%(P	1.179E-01	3.46E-02	G K
		344.30	-3.946E-02	% P	1.705E-01	5.04E-02	G
		1408.08	1.444E-02	& P	2.659E-01	7.12E-02	G
		964.00	9.183E-03	% P	7.006E-01	2.02E-01	G
		1112.07	1.751E-02	& P	5.854E-01	1.65E-01	G
		778.90	-1.076E-01	% P	4.617E-01	1.35E-01	G
EU-154	-3.3643E-03						
		123.10	-3.364E-03	%(P	1.134E-01	3.36E-02	G K
		1274.80	-2.560E-02	% P	2.199E-01	6.24E-02	G
		723.30	-2.084E-02	% P	3.360E-01	9.61E-02	G
		1004.80	-4.783E-02	% P	4.042E-01	1.15E-01	G
EU-155	3.2982E-02						
		86.45	3.298E-02	%(	1.378E-01	4.13E-02	G K
		105.31	5.559E-02	%	2.176E-01	6.53E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	-2.2876E-02						
		279.17	-2.288E-02	&(	5.455E-02	1.65E-02	G K
		72.87	-5.483E-01	% P	1.393E+00	4.21E-01	G
		70.83	1.107E+00	&	1.848E+00	5.64E-01	G
		82.50	5.880E-01	&	2.144E+00	6.43E-01	G
TL-208	2.5683E-01						
		583.14	2.599E-01	(P	5.309E-02	2.43E-02	G
		510.72	2.451E-01	*(P	2.564E-01	7.91E-02	G
PB-212	6.2978E-01						
		238.63	6.421E-01	(P	1.095E-01	4.27E-02	G K
							Energy duplication
		77.11	5.996E-01	@(	3.785E-01	1.20E-01	G
		74.81	1.055E+00	& P	7.387E-01	2.32E-01	G
PB-214	4.5312E-01						
		351.99	4.742E-01	(P	1.136E-01	4.51E-02	G K
		295.22	4.123E-01	(P	2.170E-01	7.31E-02	G
							Energy duplication
		77.11	9.638E-01	+ P	6.204E-01	1.96E-01	G
		241.92	5.865E-01	+ P	7.011E-01	2.17E-01	G
BI-212	4.5175E-01						
		727.17	4.517E-01	*(P	5.155E-01	1.64E-01	G K
		1620.56	4.702E-01	%	1.758E+00	4.97E-01	G
		785.42	1.034E+00	% P	2.527E+00	7.57E-01	G
BI-214	4.8898E-01						
		609.32	4.454E-01	@(P	1.230E-01	5.65E-02	G K
		1764.51	5.424E-01	(P	3.523E-01	1.63E-01	G
		1120.28	5.659E-01	*(P	4.309E-01	1.61E-01	G
RA-224	7.4313E-02						
		241.00	7.431E-02	%(P	4.389E-01	1.25E-01	G
RA-226	1.2097E+00						
		185.99	1.210E+00	(	1.319E+00	4.10E-01	G
AC-228	1.0134E+00						
		911.07	9.300E-01	(P	2.420E-01	1.25E-01	G K
		968.90	1.204E+00	(P	4.022E-01	1.90E-01	G
		338.40	9.374E-01	(P	3.549E-01	1.45E-01	G
TH-227	-7.4505E-02						
		236.00	-7.451E-02	%(P	4.015E-01	1.19E-01	G K
		256.25	4.427E-02	& P	6.369E-01	1.87E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-234	-4.8571E-03						
		98.44	-4.857E-03	%(	1.884E-01	5.59E-02	G K
		946.00	-5.369E-02	&	3.912E-01	1.13E-01	G
		131.28	2.504E-02	&	1.864E-01	5.54E-02	G
		94.67	-8.030E-02	&	3.592E-01	1.08E-01	G
		883.24	-5.792E-02	&	4.871E-01	1.39E-01	G
		926.70	6.305E-02	&	4.746E-01	1.34E-01	G
		569.26	2.839E-03	%	4.210E-01	1.18E-01	G
TH-234	1.5067E+00						
		63.29	8.974E-01	%(P	2.344E+00	7.06E-01	G K
		92.80	1.828E+00	(P	1.804E+00	5.58E-01	G
		92.38	2.056E+00	(P	2.151E+00	6.63E-01	G
AM-241	1.0893E-02						
		59.54	1.089E-02	%(P	3.064E-01	9.09E-02	G

(- This peak used in the nuclide activity average.

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

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

- -

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

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-1.2912E-01	-1.3251E-01	3.9373E-01	3.9380E-01	4.315E-01
K-40		1.8503E+01	1.8503E+01	2.1559E+00	2.3960E+00	
MN-54	#A	1.4638E-02	1.4703E-02	4.1339E-02	4.1347E-02	4.690E-02
CO-57	#B	9.7438E-03	9.7939E-03	4.7440E-02	4.7443E-02	5.261E-02
CO-60	#B	1.4360E-02	1.4370E-02	5.7992E-02	5.7997E-02	6.748E-02
Sr-85	#A	-1.2581E-02	-1.2852E-02	5.5671E-02	5.5676E-02	6.158E-02
Kr-85	#A	-3.2050E+02	-3.2050E+02	1.5184E+03	1.5185E+03	1.428E+03
Y-88	#B	0.0000E+00	0.0000E+00	1.0597E-02	1.0599E-02	2.570E-02
NB-94	#B	-5.1875E-03	-5.1875E-03	4.8891E-02	4.8892E-02	5.293E-02
Ag-108M	#B	1.2068E-02	1.2068E-02	5.3113E-02	5.3118E-02	6.096E-02
CD-109	#A	2.3312E-01	2.3384E-01	1.4145E+00	1.4146E+00	1.571E+00
SN-113	#B	5.5555E-03	5.6226E-03	4.9305E-02	4.9306E-02	5.632E-02
SB-125	#B	9.7190E-02	9.7323E-02	8.4380E-02	8.4559E-02	1.547E-01
I-131	#B	1.3933E-02	1.6549E-02	4.5783E-02	4.5792E-02	4.319E-02
CS-134	#B	1.6881E-02	1.6912E-02	2.0929E-02	2.0950E-02	5.092E-02
CS-137	#A	2.2404E-02	2.2407E-02	5.4164E-02	5.4178E-02	6.071E-02
CE-139	#A	2.1967E-03	2.2189E-03	4.2965E-02	4.2966E-02	4.802E-02
EU-152	#B	-1.4458E-03	-1.4462E-03	6.5649E-01	6.5649E-01	1.178E-01
EU-154	#B	-3.3628E-03	-3.3643E-03	1.7285E-01	1.7285E-01	1.134E-01
EU-155	#B	3.2957E-02	3.2982E-02	1.2382E-01	1.2383E-01	1.377E-01
HG-203	#B	-2.2207E-02	-2.2876E-02	4.9399E-02	4.9416E-02	5.296E-02
TL-208	#	2.5683E-01	2.5683E-01	7.2160E-02	7.3604E-02	5.309E-02
PB-212	#	6.2978E-01	6.2978E-01	1.2556E-01	1.3050E-01	1.095E-01
PB-214	#	4.5312E-01	4.5312E-01	1.2938E-01	1.3189E-01	1.136E-01
BI-212	#A	4.5175E-01	4.5175E-01	4.9282E-01	4.9348E-01	5.155E-01
BI-214		4.8898E-01	4.8898E-01	1.8612E-01	1.8816E-01	
RA-224	A	7.4313E-02	7.4313E-02	3.7645E-01	3.7648E-01	4.389E-01
RA-226	#A	1.2097E+00	1.2097E+00	1.2295E+00	1.2314E+00	1.319E+00
AC-228		1.0134E+00	1.0134E+00	2.6154E-01	2.6774E-01	
TH-227	#B	-7.4505E-02	-7.4505E-02	3.7829E-01	3.7832E-01	4.015E-01
PA-234	#B	-4.8571E-03	-4.8571E-03	1.6771E-01	1.6771E-01	1.884E-01
TH-234	#B	1.5067E+00	1.5067E+00	1.3607E+00	1.3633E+00	2.344E+00
AM-241	#A	1.0893E-02	1.0893E-02	2.7279E-01	2.7279E-01	3.064E-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) 2.0005636E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 2.0005636E+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_3AUG2006_1550.An1

Sample description
FSS-OOL-04-04-006-F

Spectrum Filename: C:\GammaVision\Spectra\101F_3AUG2006_1550.An1

Acquisition information

Start time:	03-Aug-2006 15:50:13
Live time:	2000
Real time:	2001
Dead time:	0.07 %
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:	1.3290E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.3290E+03) = 7.5245E+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	01-Aug-2006 16:00:00
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. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.4624

***** 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
74.51	104.	24.87	1.00	1.656E-02	74.81	9.600	PBC<MDA	PB212
77.35	212.	13.08	1.01	1.736E-02	77.11	10.700	1.152E+00	PB214
					77.11	17.500	7.167E-01	PB212
93.17	99.	32.70	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.89	68.	35.97	1.10	1.859E-02				
185.89	68.	35.97	1.10	1.859E-02	185.99	3.280	1.139E+00	RA226
209.45	55.	37.37	0.92	1.721E-02				
239.01	535.	5.04	1.12	1.555E-02	238.63	43.100	8.016E-01	PB212
241.85	85.	20.76	1.12	1.540E-02	241.00	3.900	1.426E+00	RA224
295.44	108.	17.84	1.06	1.291E-02	295.22	19.200	4.370E-01	PB214
300.65	36.	40.96	0.94	1.270E-02				
328.31	54.	31.40	1.21	1.169E-02				
338.70	73.	22.74	1.04	1.134E-02	338.40	12.010	5.282E-01	AC228
352.45	145.	13.90	1.13	1.091E-02	351.99	37.100	3.591E-01	PB214
511.23	82.	15.75	0.86	7.583E-03	510.72	22.500	3.958E-01	TL208
583.74	157.	10.12	1.51	6.678E-03	583.14	86.000	2.739E-01	TL208
609.73	130.	11.04	1.23	6.409E-03	609.32	46.090	4.417E-01	BI214
662.11	66.	18.46	2.05	5.933E-03	661.62	84.620	1.318E-01	CS137
727.46	38.	29.98	0.86	5.441E-03	727.17	11.800	5.909E-01	BI212
912.08	120.	12.55	1.45	4.442E-03	911.07	29.000	9.300E-01	AC228
969.78	77.	16.56	1.58	4.209E-03	968.90	17.460	1.051E+00	AC228
1462.02	495.	4.61	1.69	2.940E-03	1460.75	10.700	1.591E+01	K40
1765.90	29.	18.57	0.80	2.481E-03	1764.51	15.920	7.352E-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
148.58	74.88	283.	104.	0.052	74.61	1.005	PB-214 D
154.26	77.72	279.	212.	0.106	39.23	1.007	PB-214 D
418.58	209.45	164.	55.	0.027	112.10	0.921	AC-228 s
477.71	239.05	97.	535.	0.268	15.13	1.122	PB-212 D
483.40	241.90	114.	85.	0.043	62.27	1.124	PB-214 D
601.05	300.65	87.	36.	0.018	122.87	0.944	PB-212
656.39	328.31	92.	54.	0.027	94.21	1.211	RH-106M s
2242.09	1120.75	42.	32.	0.016	124.27	0.713	SC-46 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	149.19	74.81	752.	113.	0.057	101.77	1.499s
PB-214	153.79	77.11	692.	172.	0.086	67.17	1.499D
PB-212	153.79	77.11	688.	176.	0.088	67.17	1.499D
TH-234	185.92	93.17	540.	99.	0.049	98.09	1.499
RA-226	371.70	186.02	286.	69.	0.034	110.50	1.499
PB-212	477.74	239.02	302.	395.	0.197	23.57	1.499
RA-224	483.83	242.07	289.	83.	0.042	91.84	1.499
PB-214	590.78	295.52	142.	101.	0.050	57.25	1.499s
AC-228	677.28	338.75	89.	71.	0.036	64.19	1.499
PB-214	704.68	352.44	94.	146.	0.073	36.99	1.499
TL-208	1022.39	511.23	51.	66.	0.033	47.24	0.858s
TL-208	1167.50	583.74	39.	155.	0.077	30.35	1.514
BI-214	1219.50	609.73	34.	128.	0.064	33.11	1.228s
CS-137	1324.31	662.11	34.	65.	0.033	55.39	2.053s
BI-212	1455.08	727.46	35.	37.	0.019	89.94	0.857s
AC-228	1824.31	911.98	31.	96.	0.048	38.44	1.578
AC-228	1940.65	970.12	32.	48.	0.024	64.45	1.616
K-40	2925.06	1462.02	8.	493.	0.246	13.83	1.691
BI-214	3533.24	1765.90	0.	29.	0.014	55.71	0.799s

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		1.2910E-02					
			477.56	1.291E-02	%(	4.724E-01 1.34E-01	G
K-40		1.5906E+01					
			1460.75	1.591E+01	(P	5.258E-01 7.37E-01	G
MN-54		-8.8815E-04					
			834.81	-8.882E-04	%(P	6.241E-02 1.71E-02	G
CO-57		1.3908E-02					
			122.07	1.391E-02	%(	5.185E-02 1.55E-02	G K
			136.43	1.342E-01	%	4.654E-01 1.40E-01	G
CO-60		-2.5113E-03					
			1332.51	-2.511E-03	%(P	5.675E-02 1.48E-02	G K
			1173.23	-1.120E-02	& P	9.673E-02 2.75E-02	G K
Sr-85		-1.9834E-02					
			514.00	-1.983E-02	%(	6.772E-02 2.01E-02	G
Kr-85		-4.8483E+02					
			513.99	-4.848E+02	%(P	1.539E+03 4.54E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	3.195E-02 4.34E-03	G K
			898.02	1.148E-03	% P	5.086E-02 1.35E-02	G
NB-94		4.1865E-03					
			871.10	4.187E-03	&(P	4.640E-02 1.26E-02	G K
			702.50	1.706E-02	% P	4.955E-02 1.46E-02	G K
Ag-108M		-1.5658E-02					
			722.95	-1.566E-02	%(	7.608E-02 2.21E-02	G K
			614.37	-3.229E-02	% P	7.453E-02 2.25E-02	G
			433.93	-1.289E-04	%	5.305E-02 1.51E-02	G
CD-109		5.5641E-01					
			88.04	5.564E-01	&(P	1.611E+00 4.85E-01	G
SN-113		1.2954E-02					
			391.71	1.295E-02	&(	6.600E-02 1.92E-02	G K
			255.04	3.032E-01	% P	2.156E+00 6.35E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-1.2428E-03						
		427.95	-1.243E-03	&(P	1.789E-01	5.11E-02	G K
		600.77	8.109E-02	& P	2.692E-01	7.91E-02	G
		636.15	-4.258E-02	% P	4.699E-01	1.32E-01	G
		463.51	2.764E-01	% P	4.341E-01	1.34E-01	G
		176.29	1.068E-01	% P	7.219E-01	2.14E-01	G
I-131	8.0842E-04						
		364.48	8.084E-04	%(	6.623E-02	1.90E-02	G K
		636.97	-4.136E-02	%	7.456E-01	2.07E-01	G
		284.29	2.556E-02	%	8.977E-01	2.61E-01	G
CS-134	-2.0924E-02						
		604.66	-2.092E-02	%(P	6.619E-02	1.95E-02	G K
		795.76	4.026E-02	% P	7.045E-02	2.17E-02	G
		569.29	-3.250E-02	% P	3.777E-01	1.08E-01	G
		801.84	-1.293E-01	%	7.455E-01	2.14E-01	G
CS-137	1.3180E-01						
		661.62	1.318E-01	(P	6.039E-02	2.47E-02	G
CE-139	-2.3299E-03						
		165.85	-2.330E-03	%(P	4.631E-02	1.36E-02	G
EU-152	3.4298E-02						
		121.78	3.430E-02	%(P	1.619E-01	4.84E-02	G K
		344.30	-2.182E-02	% P	1.674E-01	4.85E-02	G
		1408.08	-2.805E-03	& P	3.314E-01	8.71E-02	G
		964.00	1.024E-01	% P	3.547E-01	1.02E-01	G
		1112.07	1.424E-01	% P	4.955E-01	1.44E-01	G
		778.90	1.257E-03	% P	4.179E-01	1.14E-01	G
EU-154	-2.0185E-02						
		123.10	-2.019E-02	%(P	1.181E-01	3.52E-02	G K
		1274.80	-1.920E-04	% P	2.388E-01	6.53E-02	G
		723.30	-8.123E-02	& P	3.539E-01	1.03E-01	G
		1004.80	-2.874E-02	% P	3.686E-01	1.02E-01	G
EU-155	-1.3394E-03						
		86.45	-1.339E-03	%(	1.966E-01	5.83E-02	G K
		105.31	5.128E-02	%	2.347E-01	7.02E-02	G
HG-203	2.2831E-02						
		279.17	2.283E-02	%(	5.596E-02	1.69E-02	G K
		72.87	-2.860E-01	% P	1.445E+00	4.32E-01	G
		70.83	-3.887E-01	%	2.610E+00	7.81E-01	G
		82.50	-6.766E-01	%	3.063E+00	9.18E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.7385E-01						
		583.14	2.739E-01	(P	5.638E-02	2.82E-02	G
		510.72	3.958E-01	+ P	2.133E-01	7.74E-02	G
PB-212	6.1418E-01						
		238.63	5.978E-01	(P	1.267E-01	4.77E-02	G K
							Energy duplication
		77.11	5.942E-01	(	4.219E-01	1.33E-01	G
		74.81	7.243E-01	?(P	8.357E-01	2.57E-01	G
PB-214	3.8178E-01						
		351.99	3.653E-01	(P	1.200E-01	4.57E-02	G K
		295.22	4.136E-01	*(P	2.391E-01	8.03E-02	G
							Energy duplication
		77.11	9.513E-01	+ P	6.919E-01	2.18E-01	G
		241.92	-3.043E-01	% P	7.544E-01	2.27E-01	G
BI-212	5.9088E-01						
		727.17	5.909E-01	(P	4.774E-01	1.80E-01	G K
		1620.56	0.000E+00	&	1.016E+00	1.38E-01	G
		785.42	7.765E-01	% P	2.542E+00	7.42E-01	G
BI-214	4.4171E-01						
		609.32	4.417E-01	@(P	1.023E-01	4.92E-02	G K
		1764.51	7.352E-01	+ P	1.897E-01	1.39E-01	G
		1120.28	9.119E-04	% P	4.178E-01	1.11E-01	G
RA-224	1.4041E+00						
		241.00	1.404E+00	&(P	1.382E+00	4.34E-01	G
RA-226	1.1468E+00						
		185.99	1.147E+00	(	1.360E+00	4.22E-01	G
AC-228	7.2287E-01						
		911.07	7.566E-01	(P	2.276E-01	9.88E-02	G K
		968.90	6.668E-01	(P	3.993E-01	1.45E-01	G
		338.40	5.313E-01	- P	3.479E-01	1.17E-01	G
TH-227	-2.7764E-01						
		236.00	-2.776E-01	%(P	5.844E-01	1.77E-01	G K
		256.25	5.438E-02	% P	6.513E-01	1.90E-01	G
PA-234	-4.2294E-03						
		98.44	-4.229E-03	%(	2.343E-01	6.95E-02	G K
		946.00	1.631E-03	%	3.257E-01	8.92E-02	G
		131.28	1.260E-01	&	2.212E-01	6.74E-02	G
		94.67	-1.099E-01	%	3.898E-01	1.17E-01	G
		883.24	2.093E-02	%	4.450E-01	1.21E-01	G
		926.70	-1.202E-01	%	6.392E-01	1.84E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-4.284E-02 %   5.576E-01 1.59E-01 G

TH-234       1.0060E+00
                           63.29 4.888E-01 %(P 2.618E+00 7.80E-01 G K
                           92.80 1.678E+00 &(P 1.891E+00 5.83E-01 G
                           92.38-3.649E-01 & P 2.363E+00 6.97E-01 G

AM-241       5.1504E-03
                           59.54 5.150E-03 %(P 3.338E-01 9.86E-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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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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	1.2581E-02	1.2910E-02	4.0109E-01	4.0109E-01	4.604E-01
K-40		1.5906E+01	1.5906E+01	2.2099E+00	2.3856E+00	
MN-54	#A	-8.8423E-04	-8.8815E-04	4.2820E-02	4.2820E-02	6.214E-02
CO-57	#B	1.3837E-02	1.3908E-02	4.6580E-02	4.6586E-02	5.159E-02
CO-60	#B	-2.5095E-03	-2.5113E-03	5.5318E-02	5.5318E-02	5.671E-02

Sr-85	#A	-1.9416E-02	-1.9834E-02	6.0321E-02	6.0332E-02	6.629E-02
Kr-85	#A	-4.8482E+02	-4.8483E+02	1.5875E+03	1.5877E+03	1.539E+03
Y-88	#B	0.0000E+00	0.0000E+00	1.3005E-02	1.3007E-02	3.154E-02
NB-94	#B	4.1865E-03	4.1865E-03	3.7855E-02	3.7855E-02	4.640E-02
Ag-108M	#B	-1.5657E-02	-1.5658E-02	6.6414E-02	6.6420E-02	7.608E-02
CD-109	#A	5.5471E-01	5.5641E-01	1.4563E+00	1.4566E+00	1.606E+00
SN-113	#B	1.2799E-02	1.2954E-02	5.7739E-02	5.7744E-02	6.521E-02
SB-125	#B	-1.2411E-03	-1.2428E-03	9.9851E-02	9.9851E-02	1.787E-01
I-131	#B	6.8078E-04	8.0842E-04	5.6912E-02	5.6912E-02	5.577E-02
CS-134	#B	-2.0886E-02	-2.0924E-02	6.4420E-02	6.4431E-02	6.607E-02
CS-137		1.3178E-01	1.3180E-01	7.3996E-02	7.4370E-02	
CE-139	#A	-2.3066E-03	-2.3299E-03	4.8874E-02	4.8874E-02	4.585E-02
EU-152	#B	3.4288E-02	3.4298E-02	1.4506E-01	1.4507E-01	1.619E-01
EU-154	#B	-2.0176E-02	-2.0185E-02	1.1745E-01	1.1746E-01	1.181E-01
EU-155	#B	-1.3384E-03	-1.3394E-03	1.7499E-01	1.7499E-01	1.964E-01
HG-203	#B	2.2164E-02	2.2831E-02	5.0574E-02	5.0590E-02	5.432E-02
TL-208		2.7385E-01	2.7385E-01	8.4383E-02	8.5790E-02	
PB-212	#	6.1418E-01	6.1418E-01	1.4704E-01	1.5108E-01	1.267E-01
PB-214	#	3.8178E-01	3.8178E-01	1.3225E-01	1.3400E-01	1.200E-01
BI-212		5.9088E-01	5.9088E-01	5.4111E-01	5.4214E-01	
BI-214		4.4171E-01	4.4171E-01	1.4750E-01	1.4960E-01	
RA-224	#	1.4041E+00	1.4041E+00	1.3006E+00	1.3030E+00	1.382E+00
RA-226	#A	1.1468E+00	1.1468E+00	1.2673E+00	1.2689E+00	1.360E+00
AC-228	#	7.2287E-01	7.2287E-01	2.7559E-01	2.7860E-01	2.276E-01
TH-227	#B	-2.7764E-01	-2.7764E-01	5.4095E-01	5.4118E-01	5.844E-01
PA-234	#B	-4.2294E-03	-4.2294E-03	2.0861E-01	2.0861E-01	2.343E-01
TH-234	#B	1.0060E+00	1.0060E+00	1.0487E+00	1.0502E+00	2.618E+00
AM-241	#A	5.1503E-03	5.1504E-03	2.9592E-01	2.9592E-01	3.338E-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) 1.7344645E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.7344662E+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_3AUG2006_1628.An1

Sample description
FSS-OOL-04-04-006-F-RC

Spectrum Filename: C:\GammaVision\Spectra\101F_3AUG2006_1628.An1

Acquisition information

Start time:	03-Aug-2006 16:28:09
Live time:	2000
Real time:	2001
Dead time:	0.07 %
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:	1.3290E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.3290E+03) = 7.5245E+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	01-Aug-2006 16:00:00
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: 0.6258

***** 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	119.	32.19	1.50	1.654E-02				
74.96	119.	32.19	1.50	1.654E-02	74.81	9.600	PBC<MDA	PB212
77.25	265.	10.21	1.01	1.738E-02	77.11	10.700	1.446E+00	PB214
					77.11	17.500	8.964E-01	PB212
87.26	58.	40.37	1.01	1.923E-02				
90.27	68.	33.78	1.02	1.963E-02				
93.31	97.	24.07	1.02	1.996E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.22	102.	28.40	0.99	1.857E-02	185.99	3.280	1.705E+00	RA226
209.33	66.	39.30	0.81	1.721E-02				
239.06	689.	5.95	1.09	1.555E-02	238.63	43.100	1.034E+00	PB212
241.92	67.	40.41	1.50	1.545E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	PBC<MDA	PB214
270.67	66.	25.82	1.22	1.398E-02				
295.47	117.	14.93	1.34	1.291E-02	295.22	19.200	4.715E-01	PB214
338.75	120.	18.45	1.23	1.134E-02	338.40	12.010	8.818E-01	AC228
352.12	216.	10.77	1.09	1.092E-02	351.99	37.100	5.369E-01	PB214
463.40	36.	32.07	1.50	8.342E-03	463.51	10.000	PBC<MDA	SB125
511.80	74.	22.18	1.26	7.575E-03	510.72	22.500	3.452E-01	TL208
					513.99	0.004	2.283E+03	Kr85
					514.00	99.270	1.027E-01	Sr85
583.60	153.	11.82	1.40	6.679E-03	583.14	86.000	2.666E-01	TL208
609.94	145.	12.21	1.27	6.407E-03	609.32	46.090	4.957E-01	BI214
662.50	61.	24.44	1.26	5.930E-03	661.62	84.620	1.211E-01	CS137
728.36	40.	23.34	1.85	5.443E-03	727.17	11.800	6.352E-01	BI212
795.40	43.	25.76	1.39	5.018E-03				
795.40	43.	25.76	1.39	5.018E-03	795.76	85.400	1.017E-01	CS134

912.18	87.	15.03	1.40	4.442E-03	911.07	29.000	6.713E-01	AC228
969.50	99.	17.14	1.37	4.210E-03	968.90	17.460	1.359E+00	AC228
1121.63	48.	22.66	1.32	3.711E-03	1120.28	15.040	8.821E-01	BI214
1462.11	470.	4.65	2.13	2.940E-03	1460.75	10.700	1.510E+01	K40
1766.07	15.	29.15	0.80	2.481E-03	1764.51	15.920	3.826E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
153.23	77.78	717.	133.	0.066	89.43	0.850	PB-214	
174.09	87.39	249.	58.	0.029	121.11	1.014	PB-214	D
180.11	90.40	232.	68.	0.034	101.34	1.016	PB-214	D
186.19	93.44	222.	97.	0.048	72.21	1.018	U-235	D
418.34	209.33	230.	66.	0.033	117.90	0.814	AC-228	s
477.82	239.06	811.	168.	0.084	75.52	1.089	PB-212	
541.06	270.67	102.	66.	0.033	77.46	1.223	AC-228	
704.03	352.12	262.	59.	0.030	122.63	1.086	PB-214	s

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

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.49	74.96	739.	119.	0.059	96.58	1.499
PB-214	153.79	77.11	687.	195.	0.097	59.81	1.499D
PB-212	153.79	77.11	684.	198.	0.099	59.81	1.499D
TH-234	186.18	93.30	549.	127.	0.064	78.43	1.499s
RA-226	371.96	186.15	295.	91.	0.045	86.36	1.499s
PB-212	477.65	238.98	307.	447.	0.223	21.51	1.499
RA-224	483.54	241.92	339.	67.	0.033	121.22	1.499s
PB-214	590.47	295.36	118.	116.	0.058	47.67	1.499s
AC-228	677.28	338.75	119.	118.	0.059	55.35	1.228s
PB-214	704.43	352.31	112.	155.	0.077	37.08	1.499s
SB-125	926.70	463.40	54.	36.	0.018	96.20	1.499s
TL-208	1023.53	511.80	79.	58.	0.029	66.53	1.262s
Kr-85	1023.09	511.58	45.	53.	0.027	65.80	1.499s
Sr-85	1023.10	511.58	44.	54.	0.027	65.81	1.499s
TL-208	1167.21	583.60	55.	151.	0.075	35.47	1.403
BI-214	1219.92	609.94	54.	144.	0.072	36.62	1.270
CS-137	1325.09	662.50	49.	60.	0.030	73.32	1.262s
BI-212	1456.88	728.36	20.	40.	0.020	70.03	1.849s
CS-134	1591.31	795.54	31.	26.	0.013	106.08	1.502
AC-228	1824.70	912.18	30.	85.	0.043	45.09	1.403
AC-228	1939.38	969.48	42.	97.	0.048	50.81	1.362s
BI-214	2243.86	1121.63	28.	48.	0.024	67.97	1.318s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
K-40	2925.24	1462.11	5.	467.	0.234	13.95	2.125
BI-214	3533.58	1766.07	2.	15.	0.007	87.45	0.802s

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		6.7889E-02					
			477.56	6.789E-02	&(	4.473E-01 1.29E-01	G
K-40		1.5096E+01					
			1460.75	1.510E+01	(P	4.096E-01 7.06E-01	G
MN-54		-1.2653E-02					
			834.81	-1.265E-02	%(P	6.513E-02 1.86E-02	G
CO-57		1.5850E-02					
			122.07	1.585E-02	%(	5.443E-02 1.63E-02	G K
			136.43	-2.533E-03	&	3.856E-01 1.13E-01	G
CO-60		9.5905E-03					
			1332.51	9.591E-03	%(P	7.632E-02 2.12E-02	G K
			1173.23	2.873E-02	% P	8.370E-02 2.47E-02	G K
Sr-85		7.5423E-02					
			514.00	7.542E-02	&(	4.661E-02 1.65E-02	G
Kr-85		1.6674E+03					
			513.99	1.667E+03	&(P	1.066E+03 3.74E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	3.195E-02 4.34E-03	G K
			898.02	1.462E-02	% P	5.662E-02 1.63E-02	G
NB-94		-1.8643E-04					
			871.10	-1.864E-04	%(P	5.185E-02 1.39E-02	G K
			702.50	-1.550E-02	& P	6.086E-02 1.78E-02	G K
Ag-108M		1.6490E-02					
			722.95	1.649E-02	%(	5.216E-02 1.53E-02	G K
			614.37	-3.656E-02	% P	8.082E-02 2.44E-02	G
			433.93	3.159E-04	%	4.555E-02 1.28E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	1.5502E-01						
		88.04	1.550E-01	&(P	1.342E+00	3.98E-01	G
SN-113	-2.2961E-02						
		391.71	-2.296E-02	%(	8.227E-02	2.44E-02	G K
		255.04	2.013E-01	% P	2.061E+00	6.03E-01	G
SB-125	1.0865E-01						
		427.95	-1.577E-03	%(P	1.443E-01	4.06E-02	G K
		600.77	-8.148E-02	& P	3.159E-01	9.24E-02	G
		636.15	-1.719E-02	& P	4.449E-01	1.23E-01	G
		463.51	4.349E-01	*(P	4.495E-01	1.45E-01	G
		176.29	8.178E-02	% P	6.903E-01	2.04E-01	G
I-131	-1.6537E-02						
		364.48	-1.654E-02	%(	6.866E-02	2.03E-02	G K
		636.97	-2.052E-01	%	8.595E-01	2.50E-01	G
		284.29	-1.178E-01	&	8.727E-01	2.56E-01	G
CS-134	3.4784E-02						
		604.66	1.093E-02	%(P	4.851E-02	1.40E-02	G K
		795.76	6.205E-02	(P	6.824E-02	2.23E-02	G
		569.29	-3.791E-02	% P	3.409E-01	9.68E-02	G
		801.84	6.706E-02	%	5.719E-01	1.59E-01	G
CS-137	1.2107E-01						
		661.62	1.211E-01	(P	7.163E-02	3.01E-02	G
CE-139	2.7469E-03						
		165.85	2.747E-03	&(P	5.492E-02	1.62E-02	G
EU-152	-2.2023E-02						
		121.78	-2.202E-02	%(P	1.389E-01	4.12E-02	G K
		344.30	-2.790E-03	& P	1.480E-01	4.19E-02	G
		1408.08	-8.763E-03	% P	2.863E-01	7.39E-02	G
		964.00	-7.608E-03	% P	7.089E-01	2.01E-01	G
		1112.07	1.278E-01	& P	5.215E-01	1.50E-01	G
		778.90	-1.868E-02	& P	5.064E-01	1.42E-01	G
EU-154	3.1414E-02						
		123.10	3.141E-02	%(P	1.116E-01	3.34E-02	G K
		1274.80	-6.392E-02	% P	2.806E-01	8.15E-02	G
		723.30	7.147E-02	% P	2.380E-01	6.93E-02	G
		1004.80	-7.774E-02	& P	4.149E-01	1.19E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	-2.7844E-02						
		86.45	-2.784E-02	&(	1.891E-01	5.65E-02	G K
		105.31	-1.608E-03	%	1.855E-01	5.45E-02	G
HG-203	3.4804E-03						
		279.17	3.480E-03	%(	6.077E-02	1.78E-02	G K
		72.87	1.219E-01	% P	1.407E+00	4.20E-01	G
		70.83	-1.337E+00	%	2.670E+00	8.10E-01	G
		82.50	-1.167E+00	%	2.988E+00	9.03E-01	G
TL-208	2.8289E-01						
		583.14	2.666E-01	(P	6.608E-02	3.20E-02	G
		510.72	3.452E-01	@(P	2.628E-01	9.79E-02	G
PB-212	6.8667E-01						
		238.63	6.770E-01	(P	1.278E-01	4.92E-02	G K
							Energy duplication
		77.11	6.704E-01	(	4.207E-01	1.34E-01	G
		74.81	7.600E-01	&(P	8.287E-01	2.55E-01	G
PB-214	4.1808E-01						
		351.99	3.888E-01	@(P	1.303E-01	4.87E-02	G K
		295.22	4.748E-01	*(P	2.182E-01	7.66E-02	G
							Energy duplication
		77.11	1.076E+00	+ P	6.898E-01	2.19E-01	G
		241.92	-5.401E-02	% P	9.707E-01	2.88E-01	G
BI-212	6.3520E-01						
		727.17	6.352E-01	(P	3.718E-01	1.51E-01	G K
		1620.56	-4.442E-01	%	2.519E+00	6.97E-01	G
		785.42	9.329E-02	% P	3.159E+00	8.80E-01	G
BI-214	4.9572E-01						
		609.32	4.957E-01	(P	1.270E-01	6.10E-02	G K
		1764.51	3.826E-01	- P	2.451E-01	1.15E-01	G
		1120.28	8.821E-01	+ P	4.953E-01	2.02E-01	G
RA-224	1.1267E+00						
		241.00	1.127E+00	&(P	1.493E+00	4.60E-01	G
RA-226	1.5120E+00						
		185.99	1.512E+00	*(	1.381E+00	4.35E-01	G
AC-228	7.3296E-01						
		911.07	6.713E-01	(P	2.222E-01	1.03E-01	G K
		968.90	1.337E+00	+ P	4.566E-01	2.28E-01	G
		338.40	8.818E-01	@(P	3.991E-01	1.66E-01	G

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

TH-227      -2.9677E-02
                          236.00-2.968E-02 %(P 3.721E-01 1.09E-01 G K
                          256.25 3.210E-02 % P 6.499E-01 1.89E-01 G

PA-234      -9.8497E-02
                           98.44-9.850E-02 &(  1.946E-01 5.91E-02 G K
                          946.00-4.856E-02 %   3.365E-01 9.55E-02 G
                          131.28 3.426E-02 &   2.412E-01 7.18E-02 G
                           94.67-5.778E-04 %   3.858E-01 1.14E-01 G
                          883.24-4.393E-03 &   3.618E-01 9.50E-02 G
                          926.70 1.784E-01 %   4.775E-01 1.42E-01 G
                          569.26-4.852E-02 %   5.022E-01 1.43E-01 G

TH-234       1.2423E+00
                           63.29 5.290E-01 &(P 2.533E+00 7.55E-01 G K
                           92.80 2.170E+00  (P 1.906E+00 5.95E-01 G
                           92.38-5.346E-01 & P 2.473E+00 7.32E-01 G

AM-241      -1.8220E-02
                           59.54-1.822E-02 %(P 3.393E-01 1.00E-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	6.6133E-02	6.7889E-02	3.8642E-01	3.8644E-01	4.358E-01
K-40		1.5096E+01	1.5096E+01	2.1167E+00	2.2821E+00	
MN-54	#A	-1.2596E-02	-1.2653E-02	6.4211E-02	6.4215E-02	6.483E-02
CO-57	#B	1.5768E-02	1.5850E-02	4.8989E-02	4.8997E-02	5.415E-02
CO-60	#B	9.5836E-03	9.5905E-03	6.3744E-02	6.3747E-02	7.626E-02
Sr-85	#	7.3812E-02	7.5423E-02	4.9634E-02	4.9817E-02	4.561E-02
Kr-85	#	1.6673E+03	1.6674E+03	1.1213E+03	1.1253E+03	1.066E+03
Y-88	#B	0.0000E+00	0.0000E+00	1.3007E-02	1.3010E-02	3.154E-02
NB-94	#B	-1.8643E-04	-1.8643E-04	1.8741E-01	1.8741E-01	5.185E-02
Ag-108M	#B	1.6489E-02	1.6490E-02	4.5874E-02	4.5884E-02	5.216E-02
CD-109	#A	1.5454E-01	1.5502E-01	1.1951E+00	1.1951E+00	1.338E+00
SN-113	#B	-2.2683E-02	-2.2961E-02	7.3214E-02	7.3225E-02	8.127E-02
SB-125	#B	1.0850E-01	1.0865E-01	1.0876E-01	1.0894E-01	1.441E-01
I-131	#B	-1.3894E-02	-1.6537E-02	6.0783E-02	6.0791E-02	5.769E-02
CS-134	#B	3.4719E-02	3.4784E-02	3.7489E-02	3.7541E-02	4.842E-02
CS-137	#	1.2106E-01	1.2107E-01	9.0084E-02	9.0343E-02	
CE-139	#A	2.7191E-03	2.7469E-03	4.8551E-02	4.8551E-02	5.437E-02
EU-152	#B	-2.2017E-02	-2.2023E-02	1.3885E-01	1.3885E-01	1.388E-01
EU-154	#B	3.1400E-02	3.1414E-02	1.0028E-01	1.0030E-01	1.115E-01
EU-155	#B	-2.7823E-02	-2.7844E-02	1.6938E-01	1.6938E-01	1.890E-01
HG-203	#B	3.3774E-03	3.4804E-03	5.3272E-02	5.3273E-02	5.897E-02
TL-208		2.8289E-01	2.8289E-01	1.0192E-01	1.0317E-01	
PB-212	#	6.8667E-01	6.8667E-01	1.4973E-01	1.5467E-01	1.278E-01
PB-214	#	4.1808E-01	4.1808E-01	1.2807E-01	1.3023E-01	1.303E-01
BI-212		6.3520E-01	6.3520E-01	4.5238E-01	4.5380E-01	
BI-214		4.9572E-01	4.9572E-01	1.8293E-01	1.8507E-01	
RA-224	#A	1.1267E+00	1.1267E+00	1.3804E+00	1.3818E+00	1.493E+00
RA-226	#	1.5120E+00	1.5120E+00	1.3059E+00	1.3087E+00	1.381E+00
AC-228		7.3296E-01	7.3296E-01	2.6685E-01	2.7004E-01	
TH-227	#B	-2.9677E-02	-2.9677E-02	3.8684E-01	3.8685E-01	3.721E-01
PA-234	#B	-9.8497E-02	-9.8497E-02	1.7727E-01	1.7735E-01	1.946E-01
TH-234	#B	1.2423E+00	1.2423E+00	1.0217E+00	1.0240E+00	2.533E+00
AM-241	#A	-1.8220E-02	-1.8220E-02	4.1581E-01	4.1581E-01	3.393E-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 (186.2 to 1999.1 keV) 1.7363634E+01 pCi/gm
Total Decayed Activity (186.2 to 1999.1 keV) 1.7363651E+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_3AUG2006_0905.An1

Sample description
FSS-OOL-04-04-019-F

Spectrum Filename: C:\GammaVision\Spectra\102F_3AUG2006_0905.An1

Acquisition information
Start time: 03-Aug-2006 09:05:57
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: 1.9510E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9510E+03) =
5.1256E+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	02-Aug-2006 07:38:00
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: 0.6565

***** 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	71.	41.58	1.10	8.817E-03	70.83	3.520	1.869E+00	HG203
					72.87	6.400	9.438E-01	HG203
					74.81	9.600	PBC<MDA	PB212
77.36	203.	14.85	1.10	9.687E-03	77.11	10.700	1.380E+00	PB214
					77.11	17.500	8.440E-01	PB212
209.51	116.	30.17	1.08	1.518E-02				
239.16	628.	4.66	1.22	1.378E-02	238.63	43.100	7.307E-01	PB212
					241.92	7.470	4.262E+00	PB214
242.45	94.	22.46	1.22	1.363E-02				
295.62	151.	16.55	1.26	1.145E-02	295.22	19.200	4.748E-01	PB214
338.86	137.	15.87	1.48	1.005E-02	338.40	12.010	7.848E-01	AC228
352.63	200.	12.06	1.05	9.661E-03	351.99	37.100	3.854E-01	PB214
463.89	40.	32.24	1.50	7.365E-03	463.51	10.000	PBC<MDA	SB125
511.58	78.	21.74	1.10	6.684E-03	510.72	22.500	3.605E-01	TL208
584.32	202.	11.51	1.58	5.879E-03	583.14	86.000	2.762E-01	TL208
610.56	165.	13.49	1.32	5.638E-03	609.32	46.090	4.387E-01	BI214
693.42	25.	39.51	1.10	5.007E-03				
728.70	56.	23.26	1.14	4.785E-03				
796.45	24.	37.59	1.60	4.420E-03	795.76	85.400	PBC<MDA	CS134
913.11	122.	12.30	1.13	3.914E-03				
965.83	33.	24.52	1.72	3.729E-03				
971.07	64.	16.55	1.72	3.712E-03	968.90	17.460	6.772E-01	AC228
1121.28	44.	26.33	1.97	3.283E-03	1120.28	15.040	6.116E-01	BI214
1463.36	556.	4.27	1.66	2.617E-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 Centroid Channel	Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
148.49	74.71	396.	71.	0.035	124.73	1.098	BI-207	D
154.29	77.61	355.	203.	0.102	44.54	1.100	PB-214	D

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
418.64	209.51	384.	116.	0.058	90.52	1.083	AC-228	M
477.95	239.11	114.	628.	0.314	13.99	1.215	PB-212	D
484.52	242.39	176.	94.	0.047	67.38	1.217	XE-138	D
1386.77	693.42	31.	25.	0.013	118.52	1.104	PA-234	sM
1457.36	728.70	31.	60.	0.030	54.68	1.141	J-132	M
1826.36	913.11	35.	121.	0.061	34.19	1.135	AC-228	sM
1931.37	965.58	23.	27.	0.014	94.49	1.358	TB-160	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	798.	204.	0.102	62.41	1.500D
PB-212	153.80	77.11	798.	204.	0.102	62.41	1.500D
PB-212	477.88	239.12	398.	532.	0.266	20.56	1.500
PB-214	477.90	239.13	199.	571.	0.286	16.35	1.500
PB-214	591.24	295.79	155.	139.	0.070	45.64	1.500
AC-228	677.78	339.05	122.	124.	0.062	46.39	1.500
PB-214	705.02	352.67	130.	195.	0.097	32.78	1.500
SB-125	927.53	463.89	69.	40.	0.020	96.72	1.500s
TL-208	1022.94	511.58	82.	78.	0.039	65.23	1.099
TL-208	1168.47	584.32	90.	202.	0.101	34.54	1.577
BI-214	1220.98	610.56	89.	165.	0.082	40.46	1.319s
CS-134	1592.93	796.45	28.	24.	0.012	112.78	1.601s
AC-228	1941.96	970.88	31.	59.	0.030	55.44	1.718
BI-214	2242.95	1121.28	30.	44.	0.022	78.98	1.969
K-40	2927.65	1463.37	10.	534.	0.267	13.20	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		-1.3453E-01					
			477.56	-1.345E-01	%(	4.758E-01 1.41E-01	G
K-40		1.3196E+01					
			1460.75	1.320E+01	(P	4.237E-01 5.81E-01	G
MN-54		1.1926E-02					
			834.81	1.193E-02	&(P	4.413E-02 1.28E-02	G
CO-57		-1.3748E-02					
			122.07	-1.375E-02	%(	5.367E-02 1.61E-02	G K
			136.43	-1.115E-01	%	4.465E-01 1.34E-01	G
CO-60		2.3423E-03					
			1332.51	2.342E-03	%(P	5.390E-02 1.45E-02	G K
			1173.23	-8.847E-03	%	7.460E-02 2.13E-02	G K
Sr-85		-1.4042E-02					
			514.00	-1.404E-02	%(	6.126E-02 1.81E-02	G
Kr-85		-3.2051E+02					
			513.99	-3.205E+02	%(	1.398E+03 4.14E+02	G
Y-88		-2.1443E-05					
			1836.01	-2.144E-05	%(P	5.498E-02 1.40E-02	G K
			898.02	-2.035E-03	& P	4.830E-02 1.30E-02	G
NB-94		8.6133E-03					
			871.10	8.613E-03	%(	4.371E-02 1.25E-02	G K
			702.50	2.386E-03	&	3.768E-02 1.04E-02	G K
Ag-108M		1.1592E-02					
			722.95	1.159E-02	&(	4.507E-02 1.31E-02	G K
			614.37	-2.731E-02	& P	7.275E-02 2.18E-02	G
			433.93	-4.934E-04	%	4.551E-02 1.30E-02	G
CD-109		-2.2015E-02					
			88.04	-2.201E-02	&(P	2.221E+00 6.61E-01	G
SN-113		1.0852E-02					
			391.71	1.085E-02	%(	6.745E-02 1.98E-02	G K
			255.04	-2.743E-02	%	1.875E+00 5.49E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	9.7881E-02						
		427.95	5.318E-03	&(P	1.403E-01	4.02E-02	G K
		600.77	-5.171E-03	& P	2.239E-01	6.27E-02	G
		636.15	9.933E-02	% P	3.194E-01	9.37E-02	G
		463.51	3.719E-01	*(P	3.888E-01	1.25E-01	G
		176.29	-1.432E-01	& P	7.054E-01	2.10E-01	G
I-131	4.0419E-03						
		364.48	4.042E-03	%(	5.382E-02	1.56E-02	G K
		636.97	-5.536E-02	%	7.346E-01	2.10E-01	G
		284.29	-5.840E-02	%	7.276E-01	2.14E-01	G
CS-134	2.0439E-02						
		604.66	3.382E-04	&(	4.757E-02	1.34E-02	G K
		795.76	4.341E-02	*(	4.999E-02	1.63E-02	G
		569.29	-3.746E-02	&	2.654E-01	7.63E-02	G
		801.84	-2.431E-01	% P	6.772E-01	2.02E-01	G
CS-137	-1.0512E-02						
		661.62	-1.051E-02	%(	6.019E-02	1.75E-02	G
CE-139	-8.2777E-03						
		165.85	-8.278E-03	%(P	5.196E-02	1.55E-02	G
EU-152	-4.2744E-02						
		121.78	-4.274E-02	%(P	1.614E-01	4.84E-02	G K
		344.30	3.570E-02	&	1.382E-01	4.10E-02	G
		1408.08	6.055E-02	&	1.912E-01	5.52E-02	G
		964.00	-1.104E-01	% P	4.002E-01	1.17E-01	G
		1112.07	-3.539E-02	%	5.141E-01	1.45E-01	G
		778.90	-1.379E-02	& P	4.407E-01	1.25E-01	G
EU-154	3.7419E-04						
		123.10	3.742E-04	%(P	1.126E-01	3.33E-02	G K
		1274.80	-1.145E-02	%	1.814E-01	5.03E-02	G
		723.30	5.306E-02	& P	2.024E-01	5.87E-02	G
		1004.80	-1.443E-02	&	3.143E-01	8.73E-02	G
EU-155	9.5909E-02						
		86.45	9.591E-02	%(P	2.508E-01	7.57E-02	G K
		105.31	3.898E-02	%	2.425E-01	7.25E-02	G
HG-203	8.9018E-03						
		279.17	8.902E-03	%(P	4.916E-02	1.46E-02	G K
		72.87	-1.830E-01	&	1.978E+00	5.91E-01	G
		70.83	-1.351E+00	&	3.403E+00	1.03E+00	G
		82.50	-9.223E-01	&	3.926E+00	1.18E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.9369E-01						
		583.14	2.762E-01	(P	6.416E-02	3.19E-02	G
		510.72	3.605E-01	(	2.060E-01	7.85E-02	G
PB-212	6.1924E-01						
		238.63	6.192E-01	(	1.114E-01	4.24E-02	G K
							Energy duplication
		77.11	8.462E-01	+	5.575E-01	1.76E-01	G
		74.81	4.598E-01	& P	1.187E+00	3.59E-01	G
PB-214	3.9691E-01						
		351.99	3.752E-01	(P	1.076E-01	4.11E-02	G K
		295.22	4.388E-01	(	1.913E-01	6.68E-02	G
							Energy duplication
		77.11	1.384E+00	+	9.117E-01	2.88E-01	G
		241.92	3.878E+00	+	4.646E-01	2.11E-01	G
BI-212	-7.8096E-02						
		727.17	-7.810E-02	%(	4.263E-01	1.23E-01	G K
		1620.56	-2.644E-01	% P	1.992E+00	5.34E-01	G
		785.42	-1.223E-01	% P	2.678E+00	7.55E-01	G
BI-214	4.8121E-01						
		609.32	4.387E-01	@(	1.242E-01	5.93E-02	G K
		1764.51	-1.694E-03	& P	1.441E-01	1.96E-02	G
		1120.28	6.116E-01	(	3.984E-01	1.61E-01	G
RA-224	4.4402E-01						
		241.00	4.440E-01	&(P	1.227E+00	3.69E-01	G
RA-226	8.2497E-01						
		185.99	8.250E-01	%(P	1.285E+00	3.92E-01	G
AC-228	3.3818E-01						
		911.07	5.866E-03	%(P	2.313E-01	6.54E-02	G K
		968.90	6.335E-01	(P	3.039E-01	1.17E-01	G
		338.40	7.113E-01	(	3.106E-01	1.10E-01	G
TH-227	-9.5076E-02						
		236.00	-9.508E-02	%(P	4.675E-01	1.40E-01	G K
		256.25	2.228E-01	%	5.344E-01	1.61E-01	G
PA-234	6.1651E-04						
		98.44	6.165E-04	&(	2.385E-01	7.08E-02	G K
		946.00	-6.231E-02	&	2.428E-01	7.03E-02	G
		131.28	0.000E+00	&	2.322E-01	6.88E-02	G
		94.67	-8.014E-02	%	4.574E-01	1.37E-01	G
		883.24	1.346E-01	%	3.859E-01	1.14E-01	G
		926.70	-9.668E-02	&	4.832E-01	1.39E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-5.752E-02 &   3.943E-01 1.13E-01 G

TH-234       4.4230E-01
                           63.29 4.423E-01 &(P 4.492E+00 1.34E+00 G K
                           92.80 8.151E-01 %   2.381E+00 7.18E-01 G
                           92.38 9.509E-01 % P 2.821E+00 8.50E-01 G

AM-241      -5.6213E-02
                           59.54-5.621E-02 %(  6.058E-01 1.80E-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	-1.3269E-01	-1.3453E-01	4.2355E-01	4.2361E-01	4.693E-01
K-40		1.3196E+01	1.3196E+01	1.7431E+00	1.8938E+00	4.237E-01
MN-54	#A	1.1897E-02	1.1926E-02	3.8419E-02	3.8425E-02	4.402E-02
CO-57	#B	-1.3710E-02	-1.3748E-02	4.8295E-02	4.8301E-02	5.352E-02
CO-60	#B	2.3414E-03	2.3423E-03	4.3587E-02	4.3587E-02	5.388E-02

Sr-85	#A	-1.3883E-02	-1.4042E-02	5.4405E-02	5.4410E-02	6.057E-02
Kr-85	#A	-3.2050E+02	-3.2051E+02	1.2418E+03	1.2419E+03	1.398E+03
Y-88	#B	-2.1296E-05	-2.1443E-05	5.5107E-04	5.5107E-04	5.461E-02
NB-94	#B	8.6133E-03	8.6133E-03	3.7405E-02	3.7408E-02	4.371E-02
Ag-108M	#B	1.1592E-02	1.1592E-02	3.9283E-02	3.9288E-02	4.507E-02
CD-109	#A	-2.1979E-02	-2.2015E-02	5.8913E+00	5.8913E+00	2.217E+00
SN-113	#B	1.0783E-02	1.0852E-02	5.9366E-02	5.9369E-02	6.702E-02
SB-125	#B	9.7810E-02	9.7881E-02	9.8378E-02	9.8531E-02	1.402E-01
I-131	#B	3.6885E-03	4.0419E-03	4.6927E-02	4.6928E-02	4.912E-02
CS-134	#B	2.0419E-02	2.0439E-02	2.3051E-02	2.3079E-02	4.752E-02
CS-137	#A	-1.0511E-02	-1.0512E-02	5.2375E-02	5.2378E-02	6.019E-02
CE-139	#A	-8.2336E-03	-8.2777E-03	4.9003E-02	4.9006E-02	5.169E-02
EU-152	#B	-4.2738E-02	-4.2744E-02	1.5385E-01	1.5387E-01	1.614E-01
EU-154	#B	3.7410E-04	3.7419E-04	1.0000E-01	1.0000E-01	1.126E-01
EU-155	#B	9.5870E-02	9.5909E-02	2.2711E-01	2.2718E-01	2.507E-01
HG-203	#B	8.7624E-03	8.9018E-03	4.3653E-02	4.3655E-02	4.839E-02
TL-208		2.9369E-01	2.9369E-01	1.0163E-01	1.0296E-01	
PB-212	#	6.1924E-01	6.1924E-01	1.2730E-01	1.3196E-01	1.114E-01
PB-214	#	3.9691E-01	3.9691E-01	1.1158E-01	1.1378E-01	1.076E-01
BI-212	#B	-7.8096E-02	-7.8096E-02	3.6977E-01	3.6979E-01	4.263E-01
BI-214		4.8121E-01	4.8121E-01	1.9469E-01	1.9656E-01	
RA-224	#A	4.4402E-01	4.4402E-01	1.1078E+00	1.1081E+00	1.227E+00
RA-226	#A	8.2497E-01	8.2497E-01	1.1764E+00	1.1773E+00	1.285E+00
AC-228	F	3.3818E-01	3.3818E-01	1.5689E-01	1.5803E-01	2.313E-01
TH-227	#B	-9.5076E-02	-9.5076E-02	4.3036E-01	4.3040E-01	4.675E-01
PA-234	#B	6.1651E-04	6.1651E-04	2.1239E-01	2.1239E-01	2.385E-01
TH-234	#B	4.4230E-01	4.4230E-01	4.0169E+00	4.0170E+00	4.492E+00
AM-241	#A	-5.6212E-02	-5.6213E-02	5.4058E-01	5.4058E-01	6.058E-01

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

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

Total Activity (295.2 to 1999.0 keV) 1.4309332E+01 pCi/gm
Total Decayed Activity (295.2 to 1999.0 keV) 1.4309332E+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-04-04-013-F

Spectrum Filename: C:\GammaVision\Spectra\102F_3AUG2006_0947.An1

Acquisition information

Start time:	03-Aug-2006 09:47:32
Live time:	2000
Real time:	2023
Dead time:	1.13 %
Detector ID:	3

Detector system
Det 102 - DSPP-468

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

Energy Calibration

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

Efficiency Calibration

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

Library Files

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

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.22keV)
Stop channel:	4000 (1999.02keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.6850E+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	01-Aug-2006 16:30:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6020

***** 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	246.	18.76	1.50	9.541E-03	77.11	10.700	1.930E+00	PB214
					77.11	17.500	1.180E+00	PB212
77.31	246.	18.76	1.50	9.541E-03	77.11	10.700	1.930E+00	PB214
					77.11	17.500	1.180E+00	PB212
186.49	100.	30.12	1.27	1.624E-02	185.99	3.280	PBC<MDA	RA226
209.56	80.	37.57	0.99	1.518E-02				
239.16	744.	4.33	1.22	1.378E-02	238.63	43.100	1.003E+00	PB212
242.01	120.	19.21	1.22	1.365E-02	241.00	3.900	1.779E+00	RA224
					241.92	7.470	9.408E-01	PB214
270.28	53.	35.01	1.08	1.243E-02				
278.13	52.	41.48	1.04	1.211E-02				
295.60	217.	12.65	1.26	1.145E-02	295.22	19.200	7.895E-01	PB214
300.99	74.	26.58	1.02	1.126E-02				
338.76	145.	13.81	1.39	1.005E-02	338.40	12.010	9.638E-01	AC228
352.59	280.	10.67	0.97	9.662E-03	351.99	37.100	6.245E-01	PB214
464.12	47.	32.43	1.50	7.365E-03	463.51	10.000	PBC<MDA	SB125
511.81	147.	15.23	1.63	6.681E-03	510.72	22.500	7.837E-01	TL208
584.21	241.	9.10	1.41	5.880E-03	583.14	86.000	3.814E-01	TL208
610.32	209.	12.23	1.37	5.641E-03	609.32	46.090	6.437E-01	BI214
728.29	60.	21.88	0.88	4.787E-03	727.17	11.800	8.577E-01	BI212
795.99	30.	34.61	1.60	4.420E-03	795.76	85.400	PBC<MDA	CS134
912.65	163.	11.57	1.18	3.916E-03	911.07	29.000	1.145E+00	AC228
970.13	118.	13.34	1.56	3.714E-03	968.90	17.460	1.464E+00	AC228
1121.99	84.	25.64	1.58	3.283E-03	1120.28	15.040	1.364E+00	BI214
1463.45	663.	4.00	1.92	2.617E-03	1460.75	10.700	1.897E+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	
418.74	209.56	343.	80.	0.040	112.70	0.994	AC-228	M
477.95	239.22	148.	744.	0.372	13.00	1.215	PB-212	D
483.65	242.07	204.	120.	0.060	57.63	1.217	PB-214	D
540.20	270.28	136.	53.	0.026	105.02	1.082	AC-228	M
555.91	278.13	169.	52.	0.026	114.88	1.036	SB-126	sM
601.65	300.99	135.	74.	0.037	79.74	1.018	PB-212	M
1940.47	970.13	39.	117.	0.059	35.69	1.557	AC-228	M

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

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	940.	246.	0.123	56.28	1.500D
PB-212	153.80	77.11	940.	246.	0.123	56.28	1.500D
RA-226	372.52	186.46	475.	92.	0.046	100.47	1.500
PB-212	477.88	239.13	465.	628.	0.314	18.86	1.500
RA-224	484.31	242.34	445.	99.	0.050	93.95	1.500
PB-214	485.01	242.69	459.	83.	0.042	113.93	1.500
PB-214	591.27	295.81	148.	209.	0.104	32.29	1.500
AC-228	677.43	338.88	141.	145.	0.072	42.77	1.500
PB-214	704.89	352.60	121.	254.	0.127	26.28	1.500
SB-125	927.99	464.12	102.	47.	0.024	97.30	1.500s
TL-208	1023.40	511.81	99.	147.	0.074	45.70	1.630s
TL-208	1168.25	584.21	78.	241.	0.120	27.30	1.407
BI-214	1220.50	610.32	111.	209.	0.105	36.68	1.366
BI-212	1456.53	728.29	42.	60.	0.030	65.64	0.882s
CS-134	1592.00	795.99	40.	30.	0.015	103.84	1.601
AC-228	1826.00	912.93	51.	124.	0.062	36.19	1.679
BI-214	2244.38	1121.99	76.	84.	0.042	76.93	1.579s
K-40	2927.83	1463.46	17.	640.	0.320	12.17	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		3.1652E-01					
			477.56	3.165E-01	%(	5.150E-01 1.59E-01	G
K-40		1.8308E+01					
			1460.75	1.831E+01	(P	6.302E-01 7.43E-01	G
MN-54		-8.1660E-03					
			834.81	-8.166E-03	%(P	7.141E-02 2.04E-02	G
CO-57		-2.1359E-02					
			122.07	-2.136E-02	%(	7.186E-02 2.16E-02	G K
			136.43	0.000E+00	&	5.485E-01 1.63E-01	G
CO-60		2.3019E-02					
			1332.51	2.302E-02	%(P	6.759E-02 1.99E-02	G K
			1173.23	7.360E-03	%	8.949E-02 2.54E-02	G K
Sr-85		-1.4214E-02					
			514.00	-1.421E-02	%(	6.795E-02 2.00E-02	G
Kr-85		-3.3042E+02					
			513.99	-3.304E+02	%(	1.600E+03 4.73E+02	G
Y-88		-6.7186E-03					
			1836.01	-6.719E-03	%(P	6.416E-02 1.71E-02	G K
			898.02	-1.109E-02	& P	7.363E-02 2.09E-02	G
NB-94		1.6626E-02					
			871.10	1.663E-02	%(	5.879E-02 1.72E-02	G K
			702.50	-1.429E-02	%	7.300E-02 2.14E-02	G K
Ag-108M		-1.5745E-02					
			722.95	-1.574E-02	%(	7.023E-02 2.05E-02	G K
			614.37	-6.404E-02	& P	9.576E-02 2.95E-02	G
			433.93	4.601E-03	&	4.922E-02 1.42E-02	G
CD-109		5.8232E-01					
			88.04	5.823E-01	%(P	2.537E+00 7.62E-01	G
SN-113		1.8439E-02					
			391.71	1.844E-02	%(	8.118E-02 2.40E-02	G K
			255.04	-5.219E-01	%	2.587E+00 7.71E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.4212E-01						
		427.95	1.661E-02	&(P	1.535E-01	4.43E-02	G K
		600.77	6.361E-02	% P	2.460E-01	7.18E-02	G
		636.15	-5.697E-02	% P	5.433E-01	1.56E-01	G
		463.51	5.137E-01	*(P	5.421E-01	1.72E-01	G
		176.29	-1.968E-02	& P	8.356E-01	2.47E-01	G
I-131	1.4873E-02						
		364.48	1.487E-02	%(	6.505E-02	1.92E-02	G K
		636.97	-8.257E-02	%	9.533E-01	2.73E-01	G
		284.29	2.844E-02	&	9.044E-01	2.65E-01	G
CS-134	2.1153E-02						
		604.66	-1.705E-02	%(	6.808E-02	2.01E-02	G K
		795.76	6.481E-02	(	6.875E-02	2.24E-02	G
		569.29	-2.956E-03	%	2.819E-01	7.86E-02	G
		801.84	-1.183E-01	& P	7.446E-01	2.14E-01	G
CS-137	3.3766E-02						
		661.62	3.377E-02	%(	6.162E-02	1.89E-02	G
CE-139	4.0025E-05						
		165.85	4.002E-05	&(P	6.621E-02	1.96E-02	G
EU-152	-2.2087E-03						
		121.78	-2.209E-03	&(P	2.004E-01	5.95E-02	G K
		344.30	3.534E-02	%	1.879E-01	5.55E-02	G
		1408.08	-6.031E-03	&	3.220E-01	8.67E-02	G
		964.00	-3.389E-03	& P	5.487E-01	1.54E-01	G
		1112.07	-9.476E-02	&	6.077E-01	1.75E-01	G
		778.90	-6.563E-02	% P	5.593E-01	1.61E-01	G
EU-154	-3.5699E-02						
		123.10	-3.570E-02	%(P	1.537E-01	4.61E-02	G K
		1274.80	1.556E-03	%	2.332E-01	6.46E-02	G
		723.30	-8.686E-02	% P	3.445E-01	1.01E-01	G
		1004.80	-9.965E-04	&	3.883E-01	1.07E-01	G
EU-155	-3.5164E-02						
		86.45	-3.516E-02	&(P	2.622E-01	7.80E-02	G K
		105.31	5.958E-02	&	3.060E-01	9.17E-02	G
HG-203	-7.7492E-05						
		279.17	-7.749E-05	%(P	6.460E-02	1.89E-02	G K
		72.87	-8.259E-01	%	2.442E+00	7.37E-01	G
		70.83	1.641E+00	&	3.981E+00	1.20E+00	G
		82.50	-2.149E+00	%	4.662E+00	1.41E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.8140E-01						
		583.14	3.814E-01	(P	6.950E-02	3.48E-02	G
		510.72	7.837E-01	+	2.610E-01	1.20E-01	G
PB-212	8.4617E-01						
		238.63	8.462E-01	(	1.391E-01	5.32E-02	G K
							Energy duplication
		77.11	1.180E+00	+	6.991E-01	2.21E-01	G
		74.81	8.884E-01	& P	1.456E+00	4.43E-01	G
PB-214	5.8123E-01						
		351.99	5.664E-01	(P	1.205E-01	4.97E-02	G K
		295.22	7.599E-01	+	2.162E-01	8.18E-02	G
							Energy duplication
		77.11	1.930E+00	+	1.143E+00	3.62E-01	G
		241.92	6.551E-01	?(	8.062E-01	2.49E-01	G
BI-212	8.5771E-01						
		727.17	8.577E-01	@(	4.691E-01	1.88E-01	G K
		1620.56	3.333E-02	% P	1.633E+00	3.95E-01	G
		785.42	3.284E-01	% P	3.452E+00	9.89E-01	G
BI-214	6.4375E-01						
		609.32	6.437E-01	(	1.596E-01	7.88E-02	G K
		1764.51	-1.240E-01	% P	5.630E-01	1.61E-01	G
		1120.28	1.364E+00	+	7.038E-01	3.50E-01	G
RA-224	1.4899E+00						
		241.00	1.490E+00	&(P	1.517E+00	4.72E-01	G
RA-226	1.3791E+00						
		185.99	1.379E+00	(P	1.568E+00	4.84E-01	G
AC-228	9.0104E-01						
		911.07	8.759E-01	(P	2.531E-01	1.06E-01	G K
		968.90	1.464E-02	% P	3.660E-01	1.02E-01	G
		338.40	9.616E-01	(	3.851E-01	1.37E-01	G
TH-227	-1.4670E-03						
		236.00	-1.467E-03	&(P	7.566E-01	2.25E-01	G K
		256.25	-1.674E-01	%	7.358E-01	2.19E-01	G
PA-234	1.6353E-02						
		98.44	1.635E-02	%(	2.952E-01	8.80E-02	G K
		946.00	2.684E-03	&	3.062E-01	8.44E-02	G
		131.28	-4.564E-02	%	2.917E-01	8.72E-02	G
		94.67	-7.715E-02	%	5.746E-01	1.72E-01	G
		883.24	2.833E-02	%	4.686E-01	1.30E-01	G
		926.70	0.000E+00	%	5.610E-01	1.55E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-4.305E-03 %   4.319E-01 1.21E-01 G

TH-234       4.8486E-01
                           63.29 4.849E-01 %(P 5.770E+00 1.72E+00 G K
                           92.80 1.929E+00 %   2.969E+00 9.06E-01 G
                           92.38 7.162E-03 & P 3.589E+00 1.07E+00 G

AM-241       1.1304E-01
                           59.54 1.130E-01 &(  8.057E-01 2.41E-01 G
   ( - This peak used in the nuclide activity average.

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

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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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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	3.0953E-01	3.1652E-01	4.7596E-01	4.7629E-01	5.036E-01
K-40		1.8308E+01	1.8308E+01	2.2281E+00	2.4536E+00	6.302E-01
MN-54	#A	-8.1349E-03	-8.1660E-03	6.7705E-02	6.7706E-02	7.113E-02
CO-57	#B	-2.1265E-02	-2.1359E-02	6.4880E-02	6.4890E-02	7.155E-02
CO-60	#B	2.3004E-02	2.3019E-02	5.9634E-02	5.9648E-02	6.754E-02

Sr-85	#A	-1.3955E-02	-1.4214E-02	6.0141E-02	6.0146E-02	6.671E-02
Kr-85	#A	-3.3042E+02	-3.3042E+02	1.4175E+03	1.4176E+03	1.600E+03
Y-88	#B	-6.6438E-03	-6.7186E-03	5.1685E-02	5.1686E-02	6.344E-02
NB-94	#B	1.6626E-02	1.6626E-02	5.1605E-02	5.1614E-02	5.879E-02
Ag-108M	#B	-1.5744E-02	-1.5745E-02	6.1556E-02	6.1562E-02	7.023E-02
CD-109	#A	5.8079E-01	5.8232E-01	2.2862E+00	2.2865E+00	2.530E+00
SN-113	#B	1.8249E-02	1.8439E-02	7.2020E-02	7.2028E-02	8.034E-02
SB-125	#B	1.4196E-01	1.4212E-01	1.4283E-01	1.4305E-01	1.533E-01
I-131	#B	1.2823E-02	1.4873E-02	5.7646E-02	5.7652E-02	5.609E-02
CS-134	#B	2.1119E-02	2.1153E-02	2.1964E-02	2.1996E-02	6.797E-02
CS-137	#A	3.3762E-02	3.3766E-02	5.6714E-02	5.6746E-02	6.161E-02
CE-139	#A	3.9679E-05	4.0025E-05	5.8808E-02	5.8808E-02	6.564E-02
EU-152	#B	-2.2081E-03	-2.2087E-03	8.3520E-01	8.3520E-01	2.004E-01
EU-154	#B	-3.5686E-02	-3.5699E-02	1.4029E-01	1.4030E-01	1.537E-01
EU-155	#B	-3.5141E-02	-3.5164E-02	3.6772E-01	3.6772E-01	2.620E-01
HG-203	#B	-7.5534E-05	-7.7492E-05	1.0514E-02	1.0514E-02	6.296E-02
TL-208		3.8140E-01	3.8140E-01	1.0430E-01	1.0647E-01	
PB-212	#	8.4617E-01	8.4617E-01	1.5958E-01	1.6649E-01	1.391E-01
PB-214	#	5.8123E-01	5.8123E-01	1.5299E-01	1.5642E-01	1.205E-01
BI-212	#	8.5771E-01	8.5771E-01	5.6303E-01	5.6509E-01	
BI-214		6.4375E-01	6.4375E-01	2.3613E-01	2.3887E-01	
RA-224	#A	1.4899E+00	1.4899E+00	1.4162E+00	1.4186E+00	1.517E+00
RA-226	#A	1.3791E+00	1.3791E+00	1.4528E+00	1.4549E+00	1.568E+00
AC-228		9.0104E-01	9.0104E-01	2.5262E-01	2.5763E-01	2.531E-01
TH-227	#B	-1.4670E-03	-1.4670E-03	3.8577E-01	3.8577E-01	7.566E-01
PA-234	#B	1.6353E-02	1.6353E-02	2.6390E-01	2.6390E-01	2.952E-01
TH-234	#B	4.8486E-01	4.8486E-01	5.1662E+00	5.1663E+00	5.770E+00
AM-241	#A	1.1304E-01	1.1304E-01	7.2227E-01	7.2230E-01	8.056E-01

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

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

Total Activity (270.2 to 1999.0 keV) 2.1091709E+01 pCi/gm
Total Decayed Activity (270.2 to 1999.0 keV) 2.1091709E+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_3AUG2006_1032.An1

Sample description
FSS-OOL-04-04-015-F

Spectrum Filename: C:\GammaVision\Spectra\102F_3AUG2006_1032.An1

Acquisition information
Start time: 03-Aug-2006 10:32:10
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: 1.6170E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6170E+03) =
6.1843E+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	01-Aug-2006 14:55:00
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. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.7045

***** 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	102.	26.03	1.10	9.035E-03	74.81	9.600	PBC<MDA	PB212
77.23	179.	15.78	1.10	9.684E-03	77.11	10.700	1.466E+00	PB214
					77.11	17.500	8.963E-01	PB212
139.46	60.	39.73	0.95	1.738E-02				
186.23	104.	24.99	1.19	1.626E-02	185.99	3.280	1.559E+00	RA226
209.64	58.	33.07	1.24	1.518E-02				
239.15	561.	4.94	1.22	1.378E-02	238.63	43.100	7.875E-01	PB212
					241.00	3.900	8.753E+00	RA224
242.04	74.	25.68	1.22	1.365E-02	241.92	7.470	6.086E-01	PB214
270.16	55.	40.25	1.43	1.243E-02				
295.63	108.	19.87	1.03	1.145E-02	295.22	19.200	4.104E-01	PB214
327.97	38.	40.72	0.90	1.037E-02				
339.05	104.	14.07	1.34	1.004E-02	338.40	12.010	7.194E-01	AC228
352.61	208.	10.13	1.49	9.662E-03	351.99	37.100	4.839E-01	PB214
512.08	83.	21.56	1.66	6.677E-03	510.72	22.500	4.588E-01	TL208
					513.99	0.004	2.416E+03	Kr85
					514.00	99.270	1.067E-01	Sr85
584.51	140.	12.54	1.54	5.877E-03	583.14	86.000	2.303E-01	TL208
610.50	153.	10.91	1.69	5.639E-03	609.32	46.090	4.924E-01	BI214
662.87	41.	33.85	1.49	5.220E-03	661.62	84.620	7.819E-02	CS137
728.58	45.	28.81	1.53	4.786E-03	727.17	11.800	6.663E-01	BI212
796.30	26.	33.18	1.60	4.420E-03	795.76	85.400	5.800E-02	CS134
913.07	88.	14.90	0.86	3.914E-03				
969.63	99.	16.13	1.91	3.715E-03	964.00	14.580	1.517E+00	EU152
					968.90	17.460	1.274E+00	AC228
1122.48	75.	18.95	0.85	3.278E-03	1120.28	15.040	1.269E+00	BI214
1463.48	468.	4.66	1.92	2.617E-03	1460.75	10.700	1.393E+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	
149.69	75.42	301.	102.	0.051	78.10	1.099	PB-214	D
154.05	77.60	310.	179.	0.090	47.35	1.100	PB-214	D
278.50	139.46	220.	82.	0.041	84.02	0.948	TC-99M	sM
418.89	209.64	155.	58.	0.029	99.22	1.243	NP-239	M
477.93	239.21	103.	561.	0.280	14.82	1.215	PB-212	D
483.71	242.09	145.	74.	0.037	77.03	1.217	PB-214	D
539.96	270.16	174.	55.	0.027	120.74	1.429	AC-228	M
655.60	327.97	87.	38.	0.019	122.17	0.897	AC-228	M
1325.63	662.87	45.	42.	0.021	81.01	1.487	CE-143	s
1826.28	913.07	28.	88.	0.044	40.91	0.857	-	sM
1939.46	969.63	39.	99.	0.049	40.32	1.905	AC-228	sM
2245.66	1122.48	20.	49.	0.024	58.19	1.820	TA-182	D

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

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	735.	152.	0.076	79.37	1.500D
PB-212	153.80	77.11	735.	152.	0.076	79.37	1.500D
RA-226	372.49	186.44	313.	83.	0.041	91.13	1.500s
PB-212	477.95	239.16	298.	480.	0.240	20.52	1.500
RA-224	477.93	239.15	172.	510.	0.255	17.15	1.500s
PB-214	591.06	295.70	137.	78.	0.039	72.25	1.500s
AC-228	677.80	339.06	87.	103.	0.052	48.43	1.500
PB-214	704.78	352.55	85.	184.	0.092	30.51	1.500
Kr-85	1023.57	511.89	35.	64.	0.032	54.74	1.499s
Sr-85	1023.57	511.89	35.	64.	0.032	54.74	1.499s
TL-208	1168.59	584.38	52.	123.	0.062	36.53	1.499
BI-214	1220.85	610.50	40.	153.	0.077	32.73	1.691s
BI-212	1457.11	728.58	40.	45.	0.023	86.42	1.529
CS-134	1592.63	796.30	25.	26.	0.013	99.53	1.601s
BI-214	2240.95	1120.28	25.	43.	0.022	67.20	1.819D
K-40	2927.91	1463.50	12.	448.	0.224	14.54	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		-9.4452E-02					
			477.56	-9.445E-02	&(	5.243E-01 1.53E-01	G
K-40		1.3362E+01					
			1460.75	1.336E+01	(P	5.680E-01 6.48E-01	G
MN-54		-1.2970E-02					
			834.81	-1.297E-02	%(P	6.329E-02 1.82E-02	G
CO-57		-1.6378E-03					
			122.07	-1.638E-03	&(	5.491E-02 1.62E-02	G K
			136.43	-1.800E-01	%	4.979E-01 1.50E-01	G
CO-60		-3.0970E-04					
			1332.51	-3.097E-04	%(P	5.984E-02 1.57E-02	G K
			1173.23	2.786E-02	%	6.657E-02 2.00E-02	G K
Sr-85		8.1992E-02					
			514.00	8.199E-02	&(	3.930E-02 1.50E-02	G
Kr-85		1.8564E+03					
			513.99	1.856E+03	&(	8.898E+02 3.39E+02	G
Y-88		-5.8557E-03					
			1836.01	-5.856E-03	%(P	5.691E-02 1.48E-02	G K
			898.02	2.699E-02	& P	5.800E-02 1.75E-02	G
NB-94		1.7287E-02					
			871.10	1.729E-02	&(	5.301E-02 1.56E-02	G K
			702.50	-5.294E-03	&	5.891E-02 1.68E-02	G K
Ag-108M		6.8825E-03					
			722.95	6.883E-03	&(	4.957E-02 1.39E-02	G K
			614.37	-4.835E-02	% P	8.432E-02 2.58E-02	G
			433.93	-1.192E-02	%	4.961E-02 1.46E-02	G
CD-109		6.1224E-01					
			88.04	6.122E-01	&(P	2.346E+00 7.05E-01	G
SN-113		-1.3547E-02					
			391.71	-1.355E-02	%(	8.102E-02 2.38E-02	G K
			255.04	5.941E-01	&	1.785E+00 5.34E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-7.3209E-03						
		427.95	-7.321E-03	&(P	1.718E-01	4.91E-02	G K
		600.77	3.097E-02	% P	2.779E-01	7.93E-02	G
		636.15	-5.174E-02	% P	5.158E-01	1.47E-01	G
		463.51	3.322E-01	% P	4.771E-01	1.48E-01	G
		176.29	-8.771E-02	% P	7.434E-01	2.20E-01	G
I-131	-1.8116E-02						
		364.48	-1.812E-02	%(	6.245E-02	1.85E-02	G K
		636.97	1.797E-01	%	7.816E-01	2.27E-01	G
		284.29	-1.185E-01	&	8.195E-01	2.41E-01	G
CS-134	2.9557E-02						
		604.66	4.673E-03	%(	5.044E-02	1.43E-02	G K
		795.76	5.800E-02	*(	5.723E-02	1.92E-02	G
		569.29	-4.307E-02	%	3.288E-01	9.45E-02	G
		801.84	-7.355E-03	% P	6.097E-01	1.67E-01	G
CS-137	-2.0237E-03						
		661.62	-2.024E-03	%(	7.179E-02	2.03E-02	G
CE-139	3.5951E-03						
		165.85	3.595E-03	%(P	5.062E-02	1.49E-02	G
EU-152	3.1901E-04						
		121.78	3.190E-04	&(P	1.712E-01	5.05E-02	G K
		344.30	2.816E-02	%	1.431E-01	4.19E-02	G
		1408.08	7.717E-02	&	2.419E-01	7.00E-02	G
		964.00	8.237E-05	% P	3.908E-01	1.06E-01	G
		1112.07	1.542E-01	%	5.034E-01	1.48E-01	G
		778.90	-1.078E-03	% P	5.590E-01	1.58E-01	G
EU-154	-1.3625E-02						
		123.10	-1.363E-02	%(P	1.262E-01	3.75E-02	G K
		1274.80	4.838E-04	&	2.472E-01	6.85E-02	G
		723.30	1.090E-01	& P	1.857E-01	5.79E-02	G
		1004.80	-5.224E-02	&	3.632E-01	1.03E-01	G
EU-155	-2.1506E-02						
		86.45	-2.151E-02	%(P	2.142E-01	6.32E-02	G K
		105.31	9.638E-02	&	1.958E-01	5.94E-02	G
HG-203	1.7772E-03						
		279.17	1.777E-03	&(P	5.455E-02	1.59E-02	G K
		72.87	-2.919E-01	%	2.282E+00	6.83E-01	G
		70.83	-1.074E+00	%	4.120E+00	1.24E+00	G
		82.50	3.304E-01	&	4.237E+00	1.26E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.0321E-01						
		583.14	2.032E-01	(P	5.981E-02	2.48E-02	G
		510.72	-5.906E-03	%	2.682E-01	7.70E-02	G
PB-212	6.9916E-01						
		238.63	6.736E-01	(	1.169E-01	4.61E-02	G K
							Energy duplication
		77.11	7.621E-01	(	6.460E-01	2.02E-01	G
		74.81	6.964E-01	& P	1.314E+00	3.99E-01	G
PB-214	4.2926E-01						
		351.99	4.293E-01	(P	1.061E-01	4.37E-02	G K
		295.22	2.961E-01	-	2.177E-01	7.13E-02	G
							Energy duplication
		77.11	1.246E+00	+	1.057E+00	3.30E-01	G
		241.92	3.654E-01	%	7.433E-01	2.26E-01	G
BI-212	6.6627E-01						
		727.17	6.663E-01	(	4.749E-01	1.92E-01	G K
		1620.56	-3.605E-01	% P	2.418E+00	6.52E-01	G
		785.42	-4.780E-01	% P	3.317E+00	9.53E-01	G
BI-214	4.9236E-01						
		609.32	4.924E-01	*(	1.028E-01	5.38E-02	G K
		1764.51	-2.044E-03	% P	6.365E-01	1.73E-01	G
		1120.28	7.321E-01	+	4.427E-01	1.64E-01	G
RA-224	7.9798E+00						
		241.00	7.980E+00	&(P	9.996E-01	4.57E-01	G
RA-226	1.2992E+00						
		185.99	1.299E+00	*(P	1.334E+00	4.16E-01	G
AC-228	2.0774E-01						
		911.07	-1.682E-03	%(P	2.981E-01	8.43E-02	G K
		968.90	-4.465E-04	% P	4.371E-01	1.22E-01	G
		338.40	7.134E-01	(	3.194E-01	1.15E-01	G
TH-227	3.8396E-02						
		236.00	3.840E-02	&(P	6.620E-01	1.97E-01	G K
		256.25	-5.065E-02	%	6.610E-01	1.94E-01	G
PA-234	-2.9679E-02						
		98.44	-2.968E-02	%(	2.753E-01	8.21E-02	G K
		946.00	3.467E-02	&	2.926E-01	8.21E-02	G
		131.28	4.597E-02	&	2.546E-01	7.60E-02	G
		94.67	-6.111E-02	%	5.178E-01	1.55E-01	G
		883.24	8.774E-02	&	4.702E-01	1.34E-01	G
		926.70	0.000E+00	%	5.359E-01	1.46E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-6.365E-02 %   4.870E-01 1.40E-01 G

TH-234       1.5091E+00
                           63.29 1.509E+00 %(P 5.090E+00 1.53E+00 G K
                           92.80 1.496E+00 %   2.732E+00 8.31E-01 G
                           92.38 1.704E+00 % P 3.266E+00 9.92E-01 G

AM-241      -1.2683E-01
                           59.54-1.268E-01 &(  7.634E-01 2.28E-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	-9.2250E-02	-9.4452E-02	4.5954E-01	4.5957E-01	5.121E-01
K-40		1.3362E+01	1.3362E+01	1.9441E+00	2.0837E+00	5.680E-01
MN-54	#A	-1.2918E-02	-1.2970E-02	5.8364E-02	5.8368E-02	6.304E-02
CO-57	#B	-1.6301E-03	-1.6378E-03	4.8640E-02	4.8640E-02	5.465E-02
CO-60	#B	-3.0950E-04	-3.0970E-04	3.1695E-01	3.1695E-01	5.980E-02

Sr-85	#	8.0414E-02	8.1992E-02	4.4883E-02	4.5118E-02	3.854E-02
Kr-85	#	1.8564E+03	1.8564E+03	1.0162E+03	1.0216E+03	8.898E+02
Y-88	#B	-5.7869E-03	-5.8557E-03	4.4816E-02	4.4818E-02	5.624E-02
NB-94	#B	1.7287E-02	1.7287E-02	4.6750E-02	4.6760E-02	5.301E-02
Ag-108M	#B	6.8823E-03	6.8825E-03	4.1849E-02	4.1850E-02	4.957E-02
CD-109	#A	6.1054E-01	6.1224E-01	2.1138E+00	2.1140E+00	2.339E+00
SN-113	#B	-1.3399E-02	-1.3547E-02	7.1340E-02	7.1344E-02	8.014E-02
SB-125	#B	-7.3118E-03	-7.3209E-03	4.2399E-01	4.2399E-01	1.716E-01
I-131	#B	-1.5489E-02	-1.8116E-02	5.5600E-02	5.5609E-02	5.339E-02
CS-134	#B	2.9508E-02	2.9557E-02	2.9419E-02	2.9466E-02	5.036E-02
CS-137	#A	-2.0235E-03	-2.0237E-03	6.0982E-02	6.0982E-02	7.178E-02
CE-139	#A	3.5624E-03	3.5951E-03	4.4769E-02	4.4769E-02	5.016E-02
EU-152	#B	3.1893E-04	3.1901E-04	1.5158E-01	1.5158E-01	1.711E-01
EU-154	#B	-1.3620E-02	-1.3625E-02	1.1676E-01	1.1677E-01	1.262E-01
EU-155	#B	-2.1491E-02	-2.1506E-02	4.2020E-01	4.2020E-01	2.140E-01
HG-203	#B	1.7298E-03	1.7772E-03	4.7654E-02	4.7654E-02	5.310E-02
TL-208	#	2.0321E-01	2.0321E-01	7.4473E-02	7.5341E-02	5.981E-02
PB-212	#	6.9916E-01	6.9916E-01	1.4348E-01	1.4874E-01	1.169E-01
PB-214	#	4.2926E-01	4.2926E-01	1.3125E-01	1.3344E-01	1.061E-01
BI-212		6.6627E-01	6.6627E-01	5.7579E-01	5.7701E-01	
BI-214		4.9236E-01	4.9236E-01	1.6116E-01	1.6351E-01	
RA-224	#	7.9798E+00	7.9798E+00	1.3714E+00	1.4426E+00	9.996E-01
RA-226	#A	1.2992E+00	1.2992E+00	1.2477E+00	1.2498E+00	1.334E+00
AC-228	B	2.0774E-01	2.0774E-01	1.0060E-01	1.0127E-01	2.981E-01
TH-227	#B	3.8396E-02	3.8396E-02	5.9096E-01	5.9097E-01	6.620E-01
PA-234	#B	-2.9679E-02	-2.9679E-02	2.4616E-01	2.4617E-01	2.753E-01
TH-234	#B	1.5091E+00	1.5091E+00	4.5904E+00	4.5912E+00	5.090E+00
AM-241	#A	-1.2683E-01	-1.2683E-01	6.8424E-01	6.8427E-01	7.634E-01

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

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

Total Activity (1460.5 to 1999.0 keV) 1.4728160E+01 pCi/gm
Total Decayed Activity (1460.5 to 1999.0 keV) 1.4728160E+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_3AUG2006_1119.An1

Sample description
FSS-OOL-04-04-010-F

Spectrum Filename: C:\GammaVision\Spectra\102F_3AUG2006_1119.An1

Acquisition information
Start time: 03-Aug-2006 11:45:50
Live time: 0
Real time: 0
Dead time: -100.00 %
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: 1.7050E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7050E+03) =
5.8651E+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       01-Aug-2006 16:30:00
       Decay during acquisition:      NO
       Decay during collection:       NO
       True coincidence correction:   NO
       Peaked background correction:  YES       102_150K_28APR05.Pbc
                                                01-May-2005 05:27:47
       Absorption (Internal):         NO
       Geometry correction:           NO
       Random summing:                NO


total peaks alloc.      0  cutoff   20.00000     %

*****   S U M M A R Y   O F   P E A K S   I N   R A N G E   *****
 Peak       Area   Uncert  FWHM    Corrctn   Nuclide  Brnch.     Act.   Nuc
 Energy                             Factor    Energy   Ratio    pCi/gm
 ____________________________________________________________________________
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    Centroid  Background  Net Area   Intensity   Uncert  FWHM
         Channel Energy    Counts      Counts     Cts/Sec  3 Sigma %  keV
 ____________________________________________________________________________

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


*****   S U M M A R Y   O F   L I B R A R Y   P E A K   U S A G E   *****
- Nuclide -  Average     ------------- Peak --------------
Name   Code  Activity     Energy   Activity Code MDA Value
             pCi/gm        keV     pCi/gm        pCi/gm         COMMENTS
 ____________________________________________________________________________

BE-7         0.0000E+00
                           477.56 0.000E+00 %(  1.624E+02 2.20E+01 G

K-40        -4.2710E-03
                          1460.75-4.271E-03 %(P 4.166E+02 5.65E+01 G
```

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
MN-54	-4.0094E-04						
		834.81	-4.009E-04	%(P	2.770E+01	3.76E+00	G
CO-57	0.0000E+00						
		122.07	0.000E+00	%(	8.149E+00	1.11E+00	G K
		136.43	0.000E+00	%	6.386E+01	8.66E+00	G
CO-60	-2.1772E-04						
		1332.51	-2.177E-04	%(P	4.126E+01	5.60E+00	G K
		1173.23	0.000E+00	%	3.708E+01	5.03E+00	G K
Sr-85	0.0000E+00						
		514.00	0.000E+00	%(	1.803E+01	2.45E+00	G
Kr-85	0.0000E+00						
		513.99	0.000E+00	%(	4.084E+05	5.54E+04	G
Y-88	-2.4656E-05						
		1836.01	-2.466E-05	%(P	5.537E+01	7.51E+00	G K
		898.02	-1.303E-03	% P	3.166E+01	4.30E+00	G
NB-94	0.0000E+00						
		871.10	0.000E+00	%(	2.864E+01	3.89E+00	G K
		702.50	0.000E+00	%	2.361E+01	3.20E+00	G K
Ag-108M	0.0000E+00						
		722.95	0.000E+00	%(	2.679E+01	3.63E+00	G K
		614.37	-3.005E-04	% P	2.306E+01	3.13E+00	G
		433.93	0.000E+00	%	1.653E+01	2.24E+00	G
CD-109	-2.5220E-02						
		88.04	-2.522E-02	%(P	3.590E+02	8.10E+01	G
SN-113	0.0000E+00						
		391.71	0.000E+00	%(	2.114E+01	2.87E+00	G K
		255.04	0.000E+00	%	4.366E+02	5.92E+01	G
SB-125	-3.3631E-03						
		427.95	-3.363E-03	%(P	4.957E+01	6.73E+00	G K
		600.77	-1.052E-03	% P	1.110E+02	1.51E+01	G
		636.15	-8.938E-04	% P	1.925E+02	2.61E+01	G
		463.51	-1.667E-02	% P	1.588E+02	2.16E+01	G
		176.29	-1.945E-02	% P	1.114E+02	1.51E+01	G
I-131	0.0000E+00						
		364.48	0.000E+00	%(	1.796E+01	2.44E+00	G K
		636.97	0.000E+00	%	3.466E+02	4.70E+01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		284.29	0.000E+00	%	1.897E+02	2.57E+01	G
CS-134	0.0000E+00						
		604.66	0.000E+00	%(	2.107E+01	2.86E+00	G K
		795.76	0.000E+00	%	3.100E+01	4.21E+00	G
		569.29	0.000E+00	%	1.258E+02	1.71E+01	G
		801.84	-1.051E-03	% P	3.054E+02	4.14E+01	G
CS-137	0.0000E+00						
		661.62	0.000E+00	%(	2.640E+01	3.58E+00	G
CE-139	-2.5678E-04						
		165.85	-2.568E-04	%(P	8.655E+00	1.17E+00	G
EU-152	-1.4145E-03						
		121.78	-1.415E-03	%(P	2.378E+01	3.23E+00	G K
		344.30	0.000E+00	%	4.376E+01	5.94E+00	G
		1408.08	0.000E+00	%	2.038E+02	2.76E+01	G
		964.00	-3.350E-03	% P	2.146E+02	2.91E+01	G
		1112.07	0.000E+00	%	2.605E+02	3.53E+01	G
		778.90	-1.022E-03	% P	1.997E+02	2.71E+01	G
EU-154	-2.3845E-04						
		123.10	-2.385E-04	%(P	1.711E+01	2.32E+00	G K
		1274.80	0.000E+00	%	1.119E+02	1.52E+01	G
		723.30	-1.874E-03	% P	1.232E+02	1.67E+01	G
		1004.80	0.000E+00	%	1.843E+02	2.50E+01	G
EU-155	-7.7125E-03						
		86.45	-7.712E-03	%(P	2.979E+01	4.04E+00	G K
		105.31	0.000E+00	%	3.502E+01	4.75E+00	G
HG-203	-7.6677E-05						
		279.17	-7.668E-05	%(P	1.220E+01	1.66E+00	G K
		72.87	0.000E+00	%	3.412E+02	7.81E+01	G
		70.83	9.446E+01	%	4.510E+02	6.12E+01	G
		82.50	0.000E+00	%	4.859E+02	6.59E+01	G
TL-208	-6.3631E-04						
		583.14	-6.363E-04	%(P	2.306E+01	3.13E+00	G
		510.72	0.000E+00	%	7.756E+01	1.05E+01	G
PB-212	0.0000E+00						
		238.63	0.000E+00	%(	1.964E+01	2.66E+00	G K
							Energy duplication
		77.11	0.000E+00	%	6.997E+01	9.49E+00	G
		74.81	-1.314E+01	% P	1.842E+02	4.35E+01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	-8.5348E-04						
		351.99	-8.535E-04	%(P	3.254E+01	4.41E+00	G K
		295.22	0.000E+00	%	5.307E+01	7.20E+00	G
							Energy duplication
		77.11	0.000E+00	%	1.144E+02	1.55E+01	G
		241.92	0.000E+00	%	1.145E+02	1.55E+01	G
BI-212	0.0000E+00						
		727.17	0.000E+00	%(	2.065E+02	2.80E+01	G K
		1620.56	-4.035E-02	% P	1.772E+03	2.40E+02	G
		785.42	-3.152E-03	% P	1.306E+03	1.77E+02	G
BI-214	0.0000E+00						
		609.32	0.000E+00	%(	4.487E+01	6.09E+00	G K
		1764.51	-1.939E-03	% P	3.298E+02	4.47E+01	G
		1120.28	0.000E+00	%	2.366E+02	3.21E+01	G
RA-224	-1.7210E-02						
		241.00	-1.721E-02	%(P	2.187E+02	2.97E+01	G
RA-226	-6.6264E-02						
		185.99	-6.626E-02	%(P	2.190E+02	2.97E+01	G
AC-228	-1.5950E-03						
		911.07	-1.595E-03	%(P	1.027E+02	1.39E+01	G K
		968.90	-4.235E-04	% P	1.800E+02	2.44E+01	G
		338.40	0.000E+00	%	9.670E+01	1.31E+01	G
TH-227	-1.4498E-03						
		236.00	-1.450E-03	%(P	7.490E+01	1.02E+01	G K
		256.25	0.000E+00	%	1.320E+02	1.79E+01	G
PA-234	0.0000E+00						
		98.44	0.000E+00	%(	3.249E+01	4.41E+00	G K
		946.00	0.000E+00	%	1.539E+02	2.09E+01	G
		131.28	0.000E+00	%	3.392E+01	4.60E+00	G
		94.67	0.000E+00	%	5.509E+01	7.47E+00	G
		883.24	0.000E+00	%	2.416E+02	3.28E+01	G
		926.70	0.000E+00	%	2.748E+02	3.73E+01	G
		569.26	0.000E+00	%	1.864E+02	2.53E+01	G
TH-234	-1.3929E-02						
		63.29	-1.393E-02	%(P	6.163E+02	8.36E+01	G K
		92.80	0.000E+00	%	4.378E+02	1.00E+02	G
		92.38	5.739E+01	% P	3.431E+02	7.51E+01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	0.0000E+00						
		59.54	0.000E+00	%(	9.283E+01	1.26E+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	0.0000E+00	0.0000E+00	6.6095E+01	6.6106E+01	1.586E+02
K-40	#A	-4.2710E-03	-4.2710E-03	2.5626E-02	2.5627E-02	4.166E+02
MN-54	#A	-3.9933E-04	-4.0094E-04	2.4056E-03	2.4057E-03	2.759E+01
CO-57	#B	0.0000E+00	0.0000E+00	3.3172E+00	3.3178E+00	8.112E+00
CO-60	#B	-2.1758E-04	-2.1772E-04	1.3063E-03	1.3064E-03	4.123E+01
Sr-85	#A	0.0000E+00	0.0000E+00	7.3404E+00	7.3417E+00	1.769E+01
Kr-85	#A	0.0000E+00	0.0000E+00	1.6623E+05	1.6625E+05	4.084E+05
Y-88	#B	-2.4369E-05	-2.4656E-05	1.4794E-04	1.4794E-04	5.473E+01
NB-94	#B	0.0000E+00	0.0000E+00	1.1658E+01	1.1660E+01	2.864E+01
Ag-108M	#B	0.0000E+00	0.0000E+00	1.0903E+01	1.0905E+01	2.678E+01
CD-109	#A	-2.5150E-02	-2.5220E-02	3.6091E-01	3.6091E-01	3.580E+02

SN-113	#B	0.0000E+00	0.0000E+00	8.6055E+00	8.6070E+00	2.091E+01
SB-125	#B	-3.3589E-03	-3.3631E-03	2.0178E-02	2.0179E-02	4.951E+01
I-131	#B	0.0000E+00	0.0000E+00	7.3123E+00	7.3136E+00	1.538E+01
CS-134	#B	0.0000E+00	0.0000E+00	8.5766E+00	8.5781E+00	2.103E+01
CS-137	#A	0.0000E+00	0.0000E+00	1.0748E+01	1.0750E+01	2.640E+01
CE-139	#A	-2.5446E-04	-2.5678E-04	1.5407E-03	1.5407E-03	8.577E+00
EU-152	#B	-1.4142E-03	-1.4145E-03	8.4873E-03	8.4876E-03	2.377E+01
EU-154	#B	-2.3836E-04	-2.3845E-04	1.4307E-03	1.4308E-03	1.710E+01
EU-155	#B	-7.7071E-03	-7.7125E-03	4.6275E-02	4.6277E-02	2.977E+01
HG-203	#B	-7.4648E-05	-7.6677E-05	4.6006E-04	4.6008E-04	1.188E+01
TL-208	#A	-6.3631E-04	-6.3631E-04	3.8179E-03	3.8180E-03	2.306E+01
PB-212	#B	0.0000E+00	0.0000E+00	7.9927E+00	7.9941E+00	1.964E+01
PB-214	#B	-8.5348E-04	-8.5348E-04	5.1209E-03	5.1211E-03	3.254E+01
BI-212	#B	0.0000E+00	0.0000E+00	8.4064E+01	8.4079E+01	2.065E+02
BI-214	#B	0.0000E+00	0.0000E+00	1.8264E+01	1.8267E+01	4.487E+01
RA-224	#A	-1.7210E-02	-1.7210E-02	1.0326E-01	1.0326E-01	2.187E+02
RA-226	#A	-6.6264E-02	-6.6264E-02	3.9758E-01	3.9760E-01	2.190E+02
AC-228	#B	-1.5950E-03	-1.5950E-03	9.5703E-03	9.5707E-03	1.027E+02
TH-227	#B	-1.4498E-03	-1.4498E-03	8.6989E-03	8.6992E-03	7.490E+01
PA-234	#B	0.0000E+00	0.0000E+00	1.3223E+01	1.3226E+01	3.249E+01
TH-234	#B	-1.3929E-02	-1.3929E-02	8.3574E-02	8.3577E-02	6.163E+02
AM-241	#A	0.0000E+00	0.0000E+00	3.7788E+01	3.7794E+01	9.283E+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) 0.0000000E+00 pCi/gm
Total Decayed Activity (50.2 to 1999.0 keV) 0.0000000E+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_3AUG2006_1246.An1

Sample description
FSS-OOL-04-04-014-F

Spectrum Filename: C:\GammaVision\Spectra\102F_3AUG2006_1246.An1

Acquisition information
Start time: 03-Aug-2006 12:46:50
Live time: 2000
Real time: 2017
Dead time: 0.82 %
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: 1.5430E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5430E+03) =
6.4809E+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	01-Aug-2006 15:15:00
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: 0.7987

***** 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
77.21	136.	28.08	1.50	9.541E-03	77.11	10.700	1.165E+00	PB214
					77.11	17.500	7.121E-01	PB212
77.21	136.	28.08	1.50	9.541E-03	77.11	10.700	1.165E+00	PB214
					77.11	17.500	7.121E-01	PB212
93.15	86.	40.51	1.50	1.333E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.874E+00	TH234
186.33	70.	33.29	0.98	1.625E-02	185.99	3.280	PBC<MDA	RA226
239.51	557.	7.12	1.02	1.376E-02	236.00	11.200	3.126E+00	TH227
					238.63	43.100	8.199E-01	PB212
					241.00	3.900	9.114E+00	RA224
271.10	41.	38.99	1.35	1.239E-02				
295.90	81.	24.79	1.40	1.144E-02	295.22	19.200	3.215E-01	PB214
328.55	41.	29.77	1.03	1.035E-02				
339.24	125.	15.36	1.75	1.004E-02	338.40	12.010	9.054E-01	AC228
352.62	178.	14.07	1.51	9.662E-03	351.99	37.100	4.332E-01	PB214
463.28	28.	39.64	1.50	7.365E-03	463.51	10.000	PBC<MDA	SB125
512.08	62.	24.05	1.29	6.678E-03	510.72	22.500	3.599E-01	TL208
584.29	148.	11.87	1.58	5.879E-03	583.14	86.000	2.559E-01	TL208
610.59	126.	12.26	1.15	5.638E-03	609.32	46.090	4.238E-01	BI214
662.52	60.	25.66	1.63	5.223E-03	661.62	84.620	1.196E-01	CS137
728.60	40.	24.52	1.58	4.786E-03	727.17	11.800	6.162E-01	BI212
912.96	102.	13.15	1.31	3.915E-03				
970.30	88.	16.43	0.90	3.713E-03				
1463.64	433.	4.87	2.12	2.616E-03				

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

Peak Centroid Channel	Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
541.84	271.10	100.	41.	0.021	116.96	1.354	AC-228	M

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
656.76	328.55	54.	41.	0.021	89.32	1.029	RH-106M	M
1826.07	912.96	26.	102.	0.051	36.45	1.306	AC-228	M
1940.81	970.30	34.	88.	0.044	42.59	0.901	AC-228	sM
2928.19	1463.64	3.	433.	0.217	14.51	2.125	K-40	

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	659.	136.	0.068	84.24	1.500D
PB-212	153.80	77.11	659.	136.	0.068	84.24	1.500D
TH-234	185.88	93.15	558.	86.	0.043	121.53	1.500
RA-226	372.19	186.29	303.	79.	0.039	93.83	1.500
TH-227	477.97	239.17	150.	468.	0.234	17.75	1.500s
PB-212	477.92	239.15	295.	421.	0.211	22.65	1.500s
RA-224	477.96	239.16	186.	436.	0.218	19.52	1.500s
PB-214	591.54	295.94	118.	89.	0.044	61.04	1.500
AC-228	677.39	338.86	95.	114.	0.057	46.03	1.500
PB-214	704.97	352.64	103.	162.	0.081	35.51	1.500
TL-208	1023.94	512.08	55.	62.	0.031	72.16	1.292s
TL-208	1168.40	584.29	51.	148.	0.074	35.61	1.584s
BI-214	1221.04	610.59	45.	126.	0.063	36.77	1.149
CS-137	1324.95	662.52	49.	60.	0.030	76.98	1.627
BI-212	1457.15	728.60	25.	40.	0.020	73.56	1.579

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		9.9071E-02					
			477.56	9.907E-02	&(	3.677E-01 1.07E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
K-40	-4.7194E-03						
		1460.75	-4.719E-03	%(P	1.049E+00	2.92E-01	G
MN-54	-4.8808E-04						
		834.81	-4.881E-04	&(P	5.623E-02	1.53E-02	G
CO-57	-1.5587E-03						
		122.07	-1.559E-03	%(	5.475E-02	1.61E-02	G K
		136.43	8.781E-03	%	4.053E-01	1.19E-01	G
CO-60	1.4282E-02						
		1332.51	1.428E-02	%(P	7.035E-02	1.99E-02	G K
		1173.23	1.615E-02	%	7.647E-02	2.20E-02	G K
Sr-85	-7.7690E-03						
		514.00	-7.769E-03	&(	6.122E-02	1.78E-02	G
Kr-85	-1.7575E+02						
		513.99	-1.757E+02	&(	1.385E+03	4.02E+02	G
Y-88	-2.7261E-05						
		1836.01	-2.726E-05	&(P	6.990E-02	1.78E-02	G K
		898.02	-2.757E-03	% P	5.868E-02	1.57E-02	G
NB-94	5.3927E-03						
		871.10	5.393E-03	%(	5.411E-02	1.50E-02	G K
		702.50	-1.524E-05	%	4.586E-02	1.25E-02	G K
Ag-108M	1.5785E-02						
		722.95	1.579E-02	&(	5.287E-02	1.55E-02	G K
		614.37	-5.653E-02	& P	9.027E-02	2.78E-02	G
		433.93	-1.359E-02	%	5.200E-02	1.53E-02	G
CD-109	5.5984E-02						
		88.04	5.598E-02	%(P	2.323E+00	6.90E-01	G
SN-113	2.4804E-03						
		391.71	2.480E-03	%(	6.999E-02	2.00E-02	G K
		255.04	7.778E-01	%	1.837E+00	5.54E-01	G
SB-125	1.4510E-02						
		427.95	1.451E-02	%(P	1.441E-01	4.12E-02	G K
		600.77	-1.163E-03	% P	3.193E-01	8.99E-02	G
		636.15	-9.877E-04	% P	5.114E-01	1.43E-01	G
		463.51	3.292E-01	% P	4.397E-01	1.38E-01	G
		176.29	4.781E-02	% P	7.089E-01	2.09E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
I-131	8.3845E-03						
		364.48	8.385E-03	%(	5.673E-02	1.64E-02	G K
		636.97	-3.093E-02	%	7.514E-01	2.08E-01	G
		284.29	-1.810E-01	%	8.597E-01	2.54E-01	G
CS-134	9.2068E-03						
		604.66	9.207E-03	&(	5.327E-02	1.53E-02	G K
		795.76	2.285E-02	&	5.817E-02	1.73E-02	G
		569.29	-3.132E-02	&	2.762E-01	7.80E-02	G
		801.84	-8.469E-02	% P	6.360E-01	1.79E-01	G
CS-137	1.1955E-01						
		661.62	1.196E-01	(	6.967E-02	3.07E-02	G
CE-139	7.9999E-03						
		165.85	8.000E-03	%(P	5.651E-02	1.68E-02	G
EU-152	-1.8332E-02						
		121.78	-1.833E-02	&(P	1.698E-01	5.03E-02	G K
		344.30	-3.478E-02	%	1.783E-01	5.25E-02	G
		1408.08	-3.540E-02	%	3.806E-01	1.06E-01	G
		964.00	2.887E-01	% P	3.835E-01	1.23E-01	G
		1112.07	0.000E+00	%	5.639E-01	1.55E-01	G
		778.90	-3.719E-02	% P	4.611E-01	1.30E-01	G
EU-154	2.9725E-03						
		123.10	2.972E-03	%(P	1.047E-01	3.08E-02	G K
		1274.80	-4.110E-02	%	2.601E-01	7.44E-02	G
		723.30	6.835E-02	& P	2.458E-01	7.14E-02	G
		1004.80	9.235E-02	&	3.200E-01	9.29E-02	G
EU-155	1.0077E-01						
		86.45	1.008E-01	%(P	2.926E-01	8.81E-02	G K
		105.31	2.795E-03	%	2.679E-01	7.92E-02	G
HG-203	1.9192E-02						
		279.17	1.919E-02	&(P	4.258E-02	1.29E-02	G K
		72.87	-4.212E-02	%	2.221E+00	6.61E-01	G
		70.83	-1.252E+00	&	4.434E+00	1.33E+00	G
		82.50	2.429E-01	%	4.709E+00	1.40E+00	G
TL-208	2.5588E-01						
		583.14	2.559E-01	@(P	6.223E-02	3.05E-02	G
		510.72	3.599E-01	+	2.169E-01	8.67E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-212	6.4672E-01						
		238.63	6.202E-01	@(	1.218E-01	4.68E-02	G K
							Energy duplication
		77.11	7.121E-01	@(	6.416E-01	2.00E-01	G
		74.81	5.364E-01	& P	1.351E+00	4.08E-01	G
PB-214	3.7988E-01						
		351.99	3.941E-01	(P	1.221E-01	4.68E-02	G K
		295.22	3.525E-01	(	2.123E-01	7.17E-02	G
							Energy duplication
		77.11	1.165E+00	+	1.049E+00	3.27E-01	G
		241.92	2.188E-01	%	7.938E-01	2.38E-01	G
BI-212	6.1617E-01						
		727.17	6.162E-01	(	4.041E-01	1.51E-01	G K
		1620.56	8.628E-02	& P	2.050E+00	5.18E-01	G
		785.42	1.419E+00	% P	2.573E+00	7.93E-01	G
BI-214	4.2381E-01						
		609.32	4.238E-01	(	1.143E-01	5.20E-02	G K
		1764.51	-9.313E-02	% P	5.064E-01	1.41E-01	G
		1120.28	-1.108E-02	&	4.788E-01	1.31E-01	G
RA-224	7.1430E+00						
		241.00	7.143E+00	?(P	1.088E+00	4.66E-01	G
RA-226	1.2955E+00						
		185.99	1.296E+00	(P	1.376E+00	4.28E-01	G
AC-228	2.3928E-01						
		911.07	-2.603E-03	%(P	2.517E-01	6.99E-02	G K
		968.90	2.477E-03	% P	4.091E-01	1.13E-01	G
		338.40	8.233E-01	(	3.490E-01	1.26E-01	G
TH-227	2.6286E+00						
		236.00	2.629E+00	&(P	3.356E-01	1.56E-01	G K
		256.25	1.768E-01	&	5.853E-01	1.75E-01	G
PA-234	6.1239E-02						
		98.44	6.124E-02	&(	2.506E-01	7.51E-02	G K
		946.00	-4.081E-02	%	3.302E-01	9.33E-02	G
		131.28	2.331E-02	&	2.465E-01	7.31E-02	G
		94.67	-1.275E-01	&	4.895E-01	1.47E-01	G
		883.24	0.000E+00	%	5.393E-01	1.49E-01	G
		926.70	5.304E-02	&	5.787E-01	1.62E-01	G
		569.26	-4.611E-02	&	4.090E-01	1.15E-01	G

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

TH-234       8.0603E-01
                           63.29-1.539E-02 &(P 5.296E+00 1.57E+00 G K
                           92.80 1.874E+00  (  2.470E+00 7.59E-01 G
                           92.38 4.457E-02 % P 3.070E+00 9.11E-01 G

AM-241      -4.1682E-03
                           59.54-4.168E-03 &(  6.495E-01 1.91E-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	9.6661E-02	9.9071E-02	3.2204E-01	3.2209E-01	3.588E-01
K-40	#A	-4.7194E-03	-4.7194E-03	2.6480E-01	2.6480E-01	1.049E+00
MN-54	#A	-4.8603E-04	-4.8808E-04	9.5063E-01	9.5063E-01	5.599E-02
CO-57	#B	-1.5511E-03	-1.5587E-03	4.8423E-02	4.8423E-02	5.448E-02
CO-60	#B	1.4272E-02	1.4282E-02	5.9781E-02	5.9786E-02	7.030E-02
Sr-85	#A	-7.6131E-03	-7.7690E-03	5.3291E-02	5.3293E-02	5.999E-02

Kr-85	#A	-1.7575E+02	-1.7575E+02	1.2056E+03	1.2056E+03	1.385E+03
Y-88	#B	-2.6927E-05	-2.7261E-05	7.0058E-04	7.0058E-04	6.904E-02
NB-94	#B	5.3927E-03	5.3927E-03	4.5139E-02	4.5140E-02	5.411E-02
Ag-108M	#B	1.5785E-02	1.5785E-02	4.6365E-02	4.6373E-02	5.287E-02
CD-109	#A	5.5821E-02	5.5984E-02	2.0694E+00	2.0694E+00	2.316E+00
SN-113	#B	2.4522E-03	2.4804E-03	6.0101E-02	6.0101E-02	6.919E-02
SB-125	#B	1.4491E-02	1.4510E-02	1.2349E-01	1.2349E-01	1.439E-01
I-131	#B	7.1195E-03	8.3845E-03	4.9349E-02	4.9351E-02	4.817E-02
CS-134	#B	9.1907E-03	9.2068E-03	4.6047E-02	4.6050E-02	5.318E-02
CS-137		1.1954E-01	1.1955E-01	9.2034E-02	9.2278E-02	
CE-139	#A	7.9237E-03	7.9999E-03	5.0302E-02	5.0304E-02	5.598E-02
EU-152	#B	-1.8327E-02	-1.8332E-02	1.7905E-01	1.7906E-01	1.697E-01
EU-154	#B	2.9712E-03	2.9725E-03	9.2366E-02	9.2366E-02	1.047E-01
EU-155	#B	1.0070E-01	1.0077E-01	2.6441E-01	2.6446E-01	2.924E-01
HG-203	#B	1.8658E-02	1.9192E-02	3.8606E-02	3.8621E-02	4.140E-02
TL-208	#	2.5588E-01	2.5588E-01	9.1373E-02	9.2494E-02	
PB-212	#	6.4672E-01	6.4672E-01	1.4647E-01	1.5090E-01	1.218E-01
PB-214	#	3.7988E-01	3.7988E-01	1.3421E-01	1.3589E-01	1.221E-01
BI-212		6.1617E-01	6.1617E-01	4.5326E-01	4.5458E-01	
BI-214		4.2381E-01	4.2381E-01	1.5584E-01	1.5764E-01	
RA-224	#	7.1430E+00	7.1430E+00	1.3977E+00	1.4541E+00	1.088E+00
RA-226	#A	1.2955E+00	1.2955E+00	1.2842E+00	1.2863E+00	1.376E+00
AC-228	B	2.3928E-01	2.3928E-01	1.1013E-01	1.1095E-01	2.517E-01
TH-227	#	2.6286E+00	2.6286E+00	4.6675E-01	4.8951E-01	3.356E-01
PA-234	#B	6.1239E-02	6.1239E-02	2.2518E-01	2.2520E-01	2.506E-01
TH-234	#B	8.0603E-01	8.0603E-01	9.7954E-01	9.8056E-01	5.296E+00
AM-241	#A	-4.1681E-03	-4.1682E-03	5.7434E-01	5.7434E-01	6.494E-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) 1.6546758E+00 pCi/gm
Total Decayed Activity (50.2 to 1999.0 keV) 1.6546901E+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_3AUG2006_1325.An1

Sample description
FSS-OOL-04-04-010-F

Spectrum Filename: C:\GammaVision\Spectra\102F_3AUG2006_1325.An1

Acquisition information
Start time: 03-Aug-2006 13:26:34
Live time: 2000
Real time: 2019
Dead time: 0.94 %
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: 1.7050E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7050E+03) =
5.8651E+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	01-Aug-2006 16:30:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.7524

***** 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
74.40	76.	39.42	1.10	8.817E-03	70.83	3.520	2.334E+00	HG203
					72.87	6.400	1.178E+00	HG203
					74.81	9.600	PBC<MDA	PB212
77.38	214.	14.71	1.10	9.710E-03	77.11	10.700	1.661E+00	PB214
					77.11	17.500	1.015E+00	PB212
129.74	78.	37.09	1.36	1.717E-02				
186.67	94.	33.00	1.08	1.624E-02	185.99	3.280	PBC<MDA	RA226
209.60	66.	35.62	1.23	1.518E-02				
239.60	696.	5.28	1.04	1.376E-02	238.63	43.100	9.266E-01	PB212
241.90	70.	41.04	1.50	1.365E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	5.404E-01	PB214
270.71	49.	38.03	1.02	1.241E-02				
295.80	148.	13.73	1.50	1.144E-02	295.22	19.200	5.314E-01	PB214
301.16	70.	28.03	1.68	1.125E-02				
328.93	59.	25.85	1.80	1.034E-02				
339.06	88.	17.38	0.81	1.004E-02	338.40	12.010	5.773E-01	AC228
352.46	224.	10.53	1.16	9.666E-03	351.99	37.100	4.927E-01	PB214
511.91	108.	18.79	1.22	6.680E-03	510.72	22.500	5.683E-01	TL208
					513.99	0.004	2.992E+03	Kr85
					514.00	99.270	1.322E-01	Sr85
584.23	140.	11.59	1.25	5.880E-03	583.14	86.000	2.180E-01	TL208
610.47	160.	10.90	1.33	5.639E-03	609.32	46.090	4.858E-01	BI214
912.71	108.	13.42	1.74	3.916E-03	911.07	29.000	7.510E-01	AC228
1122.06	50.	21.09	1.03	3.283E-03	1120.28	15.040	7.994E-01	BI214
1463.53	529.	4.43	2.12	2.617E-03				

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
148.38	74.71	413.	76.	0.038	118.25	1.098	BI-207	D

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
154.34	77.69	388.	214.	0.107	44.12	1.100	PB-214	D
259.06	129.74	318.	103.	0.051	79.40	1.360	AC-228	sM
418.82	209.60	218.	66.	0.033	106.87	1.226	NP-239	M
541.06	270.71	137.	49.	0.025	114.10	1.022	AC-228	M
601.97	301.16	126.	70.	0.035	84.09	1.679	PB-212	sM
657.53	328.93	81.	59.	0.029	77.56	1.800	LA-140	sM
2927.97	1463.53	7.	528.	0.264	13.24	2.122	K-40	M

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

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	878.	203.	0.102	65.32	1.500D
PB-212	153.80	77.11	878.	203.	0.102	65.32	1.500D
RA-226	372.92	186.65	397.	95.	0.047	89.96	1.500
PB-212	477.87	239.12	366.	539.	0.270	19.83	1.500s
PB-214	483.42	241.90	373.	70.	0.035	123.13	1.500s
PB-214	591.42	295.88	159.	145.	0.073	44.45	1.500s
AC-228	677.67	339.00	111.	90.	0.045	59.04	1.500
PB-214	704.80	352.56	137.	194.	0.097	33.39	1.500s
TL-208	1023.60	511.91	92.	108.	0.054	56.36	1.223s
Kr-85	1023.59	511.91	71.	72.	0.036	61.25	1.499s
Sr-85	1023.66	511.94	62.	75.	0.037	56.32	1.499s
TL-208	1168.29	584.23	54.	139.	0.070	34.78	1.252
BI-214	1220.78	610.47	49.	160.	0.080	32.71	1.326
AC-228	1825.98	912.92	30.	96.	0.048	39.13	1.679
BI-214	2244.51	1122.06	25.	50.	0.025	63.26	1.027s

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		1.7110E-01					
			477.56	1.711E-01	%(	4.733E-01 1.41E-01	G
K-40		4.6940E-02					
			1460.75	4.694E-02	%(P	9.408E-01 2.65E-01	G
MN-54		-6.1152E-03					
			834.81	-6.115E-03	%(P	6.526E-02 1.85E-02	G
CO-57		-1.0483E-02					
			122.07	-1.048E-02	%(	5.827E-02 1.74E-02	G K
			136.43	0.000E+00	%	4.982E-01 1.48E-01	G
CO-60		-4.5982E-03					
			1332.51	-4.598E-03	%(P	7.017E-02 1.93E-02	G K
			1173.23	1.073E-02	&	8.750E-02 2.50E-02	G K
Sr-85		9.1766E-02					
			514.00	9.177E-02	&(	4.807E-02 1.72E-02	G
Kr-85		1.9880E+03					
			513.99	1.988E+03	&(	1.166E+03 4.06E+02	G
Y-88		-2.4667E-05					
			1836.01	-2.467E-05	%(P	8.522E-02 2.28E-02	G K
			898.02	1.691E-03	& P	6.117E-02 1.68E-02	G
NB-94		1.4538E-03					
			871.10	1.454E-03	&(	5.154E-02 1.41E-02	G K
			702.50	1.106E-02	%	5.486E-02 1.59E-02	G K
Ag-108M		0.0000E+00					
			722.95	0.000E+00	&(	6.950E-02 1.96E-02	G K
			614.37	-3.885E-02	% P	8.344E-02 2.52E-02	G
			433.93	-1.264E-02	%	6.055E-02 1.79E-02	G
CD-109		9.4253E-01					
			88.04	9.425E-01	%(P	2.320E+00 7.01E-01	G
SN-113		-1.1015E-02					
			391.71	-1.101E-02	&(	7.847E-02 2.30E-02	G K
			255.04	-3.647E-01	%	2.262E+00 6.70E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	2.3523E-02						
		427.95	2.352E-02	&(P	1.553E-01	4.51E-02	G K
		600.77	-6.377E-02	% P	3.056E-01	8.91E-02	G
		636.15	1.075E-01	% P	3.525E-01	1.03E-01	G
		463.51	2.409E-01	% P	5.004E-01	1.51E-01	G
		176.29	1.767E-02	% P	7.505E-01	2.22E-01	G
I-131	2.5342E-03						
		364.48	2.534E-03	%(	6.257E-02	1.81E-02	G K
		636.97	2.518E-02	%	9.105E-01	2.58E-01	G
		284.29	-1.809E-01	%	9.285E-01	2.75E-01	G
CS-134	0.0000E+00						
		604.66	0.000E+00	%(	6.351E-02	1.81E-02	G K
		795.76	3.284E-02	%	7.070E-02	2.14E-02	G
		569.29	-4.657E-02	%	3.299E-01	9.52E-02	G
		801.84	-9.697E-02	% P	7.115E-01	2.04E-01	G
CS-137	-1.9193E-03						
		661.62	-1.919E-03	%(	7.981E-02	2.28E-02	G
CE-139	-3.0583E-03						
		165.85	-3.058E-03	%(P	5.957E-02	1.76E-02	G
EU-152	-3.9074E-02						
		121.78	-3.907E-02	%(P	1.833E-01	5.48E-02	G K
		344.30	-4.652E-03	%	1.490E-01	4.29E-02	G
		1408.08	-2.588E-02	&	3.262E-01	8.97E-02	G
		964.00	-2.691E-03	& P	5.542E-01	1.56E-01	G
		1112.07	-3.226E-02	&	4.839E-01	1.34E-01	G
		778.90	3.247E-02	% P	4.066E-01	1.14E-01	G
EU-154	-2.7368E-02						
		123.10	-2.737E-02	%(P	1.159E-01	3.47E-02	G K
		1274.80	-3.529E-03	%	2.224E-01	6.15E-02	G
		723.30	6.544E-02	& P	2.545E-01	7.40E-02	G
		1004.80	4.040E-04	&	3.864E-01	1.07E-01	G
EU-155	1.0975E-01						
		86.45	1.098E-01	%(P	2.801E-01	8.46E-02	G K
		105.31	-1.475E-02	&	2.820E-01	8.38E-02	G
HG-203	1.1704E-02						
		279.17	1.170E-02	&(P	5.393E-02	1.60E-02	G K
		72.87	-2.897E-01	%	2.392E+00	7.16E-01	G
		70.83	-1.111E+00	%	4.093E+00	1.23E+00	G
		82.50	-1.310E+00	%	4.708E+00	1.42E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.1795E-01						
		583.14	2.180E-01	(P	5.768E-02	2.54E-02	G
		510.72	5.683E-01	+	2.494E-01	1.07E-01	G
PB-212	7.1805E-01						
		238.63	7.181E-01	@(	1.223E-01	4.75E-02	G K
							Energy duplication
		77.11	9.648E-01	+	6.682E-01	2.10E-01	G
		74.81	4.386E-01	& P	1.433E+00	4.32E-01	G
PB-214	4.6953E-01						
		351.99	4.274E-01	@(P	1.262E-01	4.77E-02	G K
		295.22	5.234E-01	@(	2.215E-01	7.75E-02	G
							Energy duplication
		77.11	1.578E+00	+	1.093E+00	3.44E-01	G
		241.92	5.404E-01	(	7.201E-01	2.22E-01	G
BI-212	-1.3600E-01						
		727.17	-1.360E-01	&(	5.339E-01	1.57E-01	G K
		1620.56	-2.341E-01	% P	1.851E+00	4.77E-01	G
		785.42	3.930E-01	% P	2.389E+00	6.78E-01	G
BI-214	4.8582E-01						
		609.32	4.858E-01	(	1.079E-01	5.31E-02	G K
		1764.51	-1.939E-03	% P	3.752E-01	9.50E-02	G
		1120.28	7.994E-01	+	4.190E-01	1.69E-01	G
RA-224	9.0833E-01						
		241.00	9.083E-01	&(P	1.317E+00	4.04E-01	G
RA-226	1.4076E+00						
		185.99	1.408E+00	(P	1.420E+00	4.42E-01	G
AC-228	6.4334E-01						
		911.07	6.659E-01	(P	1.979E-01	8.71E-02	G K
		968.90	1.447E-02	% P	5.038E-01	1.43E-01	G
		338.40	5.889E-01	(	3.401E-01	1.16E-01	G
TH-227	-1.4498E-03						
		236.00	-1.450E-03	&(P	6.610E-01	1.96E-01	G K
		256.25	-1.315E-01	%	6.522E-01	1.94E-01	G
PA-234	-8.8053E-03						
		98.44	-8.805E-03	%(	2.661E-01	7.91E-02	G K
		946.00	-1.615E-02	%	3.126E-01	8.72E-02	G
		131.28	-6.502E-02	&	2.745E-01	8.23E-02	G
		94.67	-1.946E-01	%	5.086E-01	1.54E-01	G
		883.24	-2.174E-02	%	4.564E-01	1.26E-01	G
		926.70	-6.592E-02	&	5.090E-01	1.43E-01	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-6.613E-02 %   4.873E-01 1.40E-01 G

TH-234      -7.3831E-01
                           63.29-7.383E-01 %(P 5.293E+00 1.58E+00 G K
                           92.80 1.902E+00 %   2.595E+00 7.95E-01 G
                           92.38-5.210E-02 % P 3.135E+00 9.32E-01 G

AM-241       8.1043E-03
                           59.54 8.104E-03 &(  7.795E-01 2.31E-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	1.6699E-01	1.7110E-01	4.2420E-01	4.2431E-01	4.619E-01
K-40	A	4.6940E-02	4.6940E-02	7.9367E-01	7.9368E-01	9.408E-01
MN-54	#A	-6.0898E-03	-6.1152E-03	6.3323E-02	6.3324E-02	6.499E-02
CO-57	#B	-1.0432E-02	-1.0483E-02	5.2193E-02	5.2197E-02	5.800E-02
CO-60	#B	-4.5951E-03	-4.5982E-03	6.3595E-02	6.3595E-02	7.012E-02

Sr-85	#	8.9947E-02	9.1766E-02	5.1683E-02	5.1939E-02	4.712E-02
Kr-85	#	1.9880E+03	1.9880E+03	1.2177E+03	1.2228E+03	1.166E+03
Y-88	#B	-2.4369E-05	-2.4667E-05	8.9649E-04	8.9649E-04	8.418E-02
NB-94	#B	1.4538E-03	1.4538E-03	4.2429E-02	4.2429E-02	5.154E-02
Ag-108M	#B	0.0000E+00	0.0000E+00	5.8791E-02	5.8791E-02	6.950E-02
CD-109	#A	9.3983E-01	9.4253E-01	2.1043E+00	2.1050E+00	2.314E+00
SN-113	#B	-1.0891E-02	-1.1015E-02	6.8943E-02	6.8946E-02	7.759E-02
SB-125	#B	2.3492E-02	2.3523E-02	1.3540E-01	1.3541E-01	1.551E-01
I-131	#B	2.1564E-03	2.5342E-03	5.4196E-02	5.4196E-02	5.324E-02
CS-134	#B	0.0000E+00	0.0000E+00	5.4299E-02	5.4299E-02	6.340E-02
CS-137	#A	-1.9191E-03	-1.9193E-03	6.8465E-02	6.8465E-02	7.980E-02
CE-139	#A	-3.0296E-03	-3.0583E-03	6.2598E-02	6.2599E-02	5.901E-02
EU-152	#B	-3.9063E-02	-3.9074E-02	1.7677E-01	1.7678E-01	1.832E-01
EU-154	#B	-2.7356E-02	-2.7368E-02	1.0587E-01	1.0588E-01	1.159E-01
EU-155	#B	1.0968E-01	1.0975E-01	2.5375E-01	2.5383E-01	2.799E-01
HG-203	#B	1.1383E-02	1.1704E-02	4.7967E-02	4.7971E-02	5.245E-02
TL-208		2.1795E-01	2.1795E-01	7.6023E-02	7.7000E-02	
PB-212	#	7.1805E-01	7.1805E-01	1.4242E-01	1.4801E-01	1.223E-01
PB-214	#	4.6953E-01	4.6953E-01	1.5710E-01	1.5930E-01	1.262E-01
BI-212	#B	-1.3600E-01	-1.3600E-01	4.7013E-01	4.7019E-01	5.339E-01
BI-214		4.8582E-01	4.8582E-01	1.5892E-01	1.6124E-01	
RA-224	#A	9.0833E-01	9.0833E-01	1.2129E+00	1.2139E+00	1.317E+00
RA-226	#A	1.4076E+00	1.4076E+00	1.3259E+00	1.3282E+00	1.420E+00
AC-228		6.4334E-01	6.4334E-01	2.2801E-01	2.3085E-01	1.979E-01
TH-227	#B	-1.4498E-03	-1.4498E-03	3.3618E-01	3.3618E-01	6.610E-01
PA-234	#B	-8.8053E-03	-8.8053E-03	2.3717E-01	2.3717E-01	2.661E-01
TH-234	#B	-7.3831E-01	-7.3831E-01	4.9258E+00	4.9260E+00	5.293E+00
AM-241	#A	8.1042E-03	8.1043E-03	6.9448E-01	6.9448E-01	7.795E-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 (86.7 to 1999.0 keV) 1.3471131E+00 pCi/gm
Total Decayed Activity (86.7 to 1999.0 keV) 1.3471131E+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: 103F3AUG2006_0847.An1

Sample description
FSS-OOL-04-04-019-F-A

Spectrum Filename: C:\GammaVision\Spectra\103F3AUG2006_0847.An1

Acquisition information
Start time: 03-Aug-2006 08:47:57
Live time: 2000
Real time: 2001
Dead time: 0.06 %
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: 2.0950E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0950E+03) =
4.7733E+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	02-Aug-2006 07:38:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1672

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.94	47.	40.58	0.99	9.052E-03	74.81	9.600	PBC<MDA	PB212
76.78	117.	26.09	0.98	9.961E-03	77.11	17.500	4.144E-01	PB212
186.34	119.	24.01	1.09	2.566E-02	185.99	3.280	8.125E-01	RA226
238.95	415.	6.25	1.09	2.318E-02	238.63	43.100	2.599E-01	PB212
242.15	101.	18.54	1.10	2.301E-02	241.00	3.900	7.209E-01	RA224
					241.92	7.470	3.772E-01	PB214
295.30	164.	10.37	1.13	2.025E-02	295.22	19.200	2.647E-01	PB214
300.00	38.	37.65	1.13	2.002E-02				
338.54	121.	18.79	1.16	1.830E-02	338.40	12.010	3.519E-01	AC228
352.02	343.	8.46	1.02	1.775E-02	351.99	37.100	3.300E-01	PB214
463.06	35.	36.67	1.50	1.425E-02	463.51	10.000	PBC<MDA	SB125
510.87	117.	17.15	1.71	1.317E-02	510.72	22.500	1.966E-01	TL208
583.41	124.	11.40	1.16	1.184E-02	583.14	86.000	7.548E-02	TL208
609.45	248.	8.14	1.31	1.144E-02	609.32	46.090	2.954E-01	BI214
726.87	46.	29.04	1.12	9.965E-03	727.17	11.800	2.507E-01	BI212
911.43	97.	14.98	1.63	8.399E-03	911.07	29.000	2.479E-01	AC228
969.15	78.	16.84	1.14	8.024E-03	968.90	17.460	3.607E-01	AC228
1120.47	61.	18.81	1.49	7.211E-03	1120.28	15.040	3.533E-01	BI214
1461.18	516.	4.51	1.73	5.931E-03	1460.75	10.700	5.052E+00	K40
1764.89	39.	16.09	1.27	5.142E-03	1764.51	15.920	3.083E-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	
483.46	242.22	123.	101.	0.050	55.61	1.095	PB-214	lD

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected
599.06	299.95	135.	50.	0.025	118.11	1.527	TH-227 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	153.39	77.11	183.	73.	0.036	83.72	0.995A
RA-226	371.48	186.16	325.	97.	0.048	74.17	1.500
PB-212	477.10	238.97	350.	411.	0.206	25.56	0.820
PB-214	589.65	295.25	162.	159.	0.079	44.72	0.993
AC-228	676.22	338.54	133.	120.	0.060	56.37	1.155
PB-214	703.18	352.02	152.	337.	0.168	25.38	1.023
SB-125	925.24	463.06	73.	35.	0.018	110.02	1.500s
TL-208	1020.86	510.87	111.	90.	0.045	51.45	1.713s
TL-208	1165.92	583.41	37.	119.	0.060	34.20	1.155
BI-214	1218.00	609.45	62.	241.	0.121	24.43	1.313
BI-212	1452.81	726.87	42.	46.	0.023	87.11	1.116
AC-228	1821.90	911.43	41.	94.	0.047	44.93	1.633
AC-228	1937.31	969.15	28.	78.	0.039	50.52	1.144
BI-214	2239.90	1120.47	27.	59.	0.030	56.43	1.487s
K-40	2921.22	1461.18	25.	497.	0.249	13.53	1.733
BI-214	3528.54	1764.89	5.	39.	0.020	48.28	1.273s

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		4.4661E-02					
			477.56	4.466E-02	%(	1.652E-01 4.85E-02	G
K-40		5.0516E+00					
			1460.75	5.052E+00	(P	2.639E-01 2.36E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
MN-54	-5.1441E-04						
		834.81	-5.144E-04	&(P	2.063E-02	5.65E-03	G
CO-57	-4.4995E-03						
		122.07	-4.499E-03	&(P	2.660E-02	7.89E-03	G K
		136.43	4.994E-02	%	2.325E-01	6.94E-02	G
CO-60	-3.4571E-03						
		1332.51	-3.457E-03	%(P	2.189E-02	5.39E-03	G K
		1173.23	7.982E-03	% P	2.155E-02	6.25E-03	G K
Sr-85	-7.5385E-03						
		514.00	-7.538E-03	%(	2.712E-02	8.06E-03	G
Kr-85	-1.7209E+02						
		513.99	-1.721E+02	%(	6.191E+02	1.84E+02	G
Y-88	-2.5789E-03						
		1836.01	-2.579E-03	%(P	2.303E-02	6.16E-03	G K
		898.02	-7.523E-04	% P	2.369E-02	6.47E-03	G
NB-94	-2.4886E-03						
		871.10	-2.489E-03	%(	2.203E-02	6.23E-03	G K
		702.50	6.864E-04	%	1.838E-02	5.10E-03	G K
Ag-108M	1.4111E-03						
		722.95	1.411E-03	%(	2.333E-02	6.57E-03	G K
		614.37	-4.287E-03	% P	2.401E-02	6.96E-03	G
		433.93	-2.303E-03	&	2.434E-02	7.07E-03	G
CD-109	6.0694E-01						
							Energy duplication
		88.04	6.069E-01	%(	1.202E+00	3.65E-01	G
SN-113	3.7536E-05						
		391.71	3.754E-05	%(	3.037E-02	8.71E-03	G K
		255.04	1.860E-01	&	8.864E-01	2.62E-01	G
SB-125	4.2711E-02						
		427.95	3.002E-03	&(P	7.265E-02	2.10E-02	G K
		600.77	2.507E-02	& P	1.099E-01	3.21E-02	G
		636.15	-6.383E-02	% P	2.091E-01	6.16E-02	G
		463.51	1.602E-01	*(P	1.930E-01	6.09E-02	G
		176.29	-1.192E-02	&	3.260E-01	9.59E-02	G
I-131	-2.4524E-04						
		364.48	-2.452E-04	&(P	2.635E-02	7.56E-03	G K
		636.97	-9.362E-03	%	3.608E-01	1.03E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		284.29	-1.452E-02	& P	3.669E-01	1.07E-01	G
CS-134	-8.2482E-03						
		604.66	-8.248E-03	%(	2.759E-02	8.20E-03	G K
		795.76	1.466E-02	% P	1.980E-02	6.35E-03	G
		569.29	-2.106E-02	% P	1.330E-01	3.77E-02	G
		801.84	-9.969E-03	& P	1.929E-01	5.01E-02	G
CS-137	2.7673E-03						
		661.62	2.767E-03	%(P	2.520E-02	7.15E-03	G
CE-139	0.0000E+00						
		165.85	0.000E+00	&(	2.679E-02	7.87E-03	G
EU-152	1.8877E-02						
		121.78	1.888E-02	&(P	8.638E-02	2.58E-02	G K
		344.30	-1.544E-03	% P	7.803E-02	2.26E-02	G
		1408.08	-5.113E-04	%	1.074E-01	2.85E-02	G
		964.00	7.320E-02	% P	1.352E-01	4.15E-02	G
		1112.07	-1.215E-03	%	1.574E-01	4.25E-02	G
		778.90	-1.150E-02	%	1.736E-01	4.90E-02	G
EU-154	6.4778E-03						
		123.10	6.478E-03	%(	6.783E-02	2.01E-02	G K
		1274.80	3.551E-04	&	6.616E-02	1.78E-02	G
		723.30	1.583E-03	%	1.269E-01	3.59E-02	G
		1004.80	1.033E-03	&	1.164E-01	3.15E-02	G
EU-155	7.4372E-03						
		86.45	7.437E-03	%(	1.544E-01	4.58E-02	G K
		105.31	3.377E-02	%	1.433E-01	4.29E-02	G
HG-203	-6.5308E-04						
		279.17	-6.531E-04	&(P	2.643E-02	7.72E-03	G K
		72.87	2.657E-02	% P	1.327E+00	3.93E-01	G
		70.83	-7.717E-01	%	2.731E+00	8.20E-01	G
		82.50	-7.315E-01	%	2.500E+00	7.51E-01	G
TL-208	7.5477E-02						
		583.14	7.548E-02	(P	1.962E-02	8.92E-03	G
		510.72	1.966E-01	+ P	1.126E-01	4.37E-02	G
PB-212	2.6543E-01						
		238.63	2.654E-01	(P	5.796E-02	2.33E-02	G K
							Energy duplication
		77.11	2.654E-01	} P	2.394E-01	7.41E-02	G
		74.81	3.457E-01	% P	4.860E-01	1.50E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	3.3000E-01						
		351.99	3.300E-01	(P	5.893E-02	2.84E-02	G K
		295.22	2.636E-01	- P	1.030E-01	4.03E-02	G
							Energy duplication
		77.11	0.000E+00	} P	5.413E-01	0.00E+00	G
		241.92	-3.993E-03	%	3.887E-01	1.15E-01	G
BI-212	2.5073E-01						
		727.17	2.507E-01	(P	1.811E-01	7.36E-02	G K
		1620.56	8.447E-02	% P	6.252E-01	1.66E-01	G
		785.42	-1.250E-01	%	1.174E+00	3.35E-01	G
BI-214	3.0935E-01						
		609.32	2.954E-01	(P	4.805E-02	2.47E-02	G K
		1764.51	3.083E-01	(P	1.024E-01	5.38E-02	G
		1120.28	3.533E-01	@(P	1.590E-01	6.86E-02	G
RA-224	4.4097E-01						
		241.00	4.410E-01	%(	6.790E-01	2.08E-01	G
RA-226	7.4030E-01						
		185.99	7.403E-01	(P	6.646E-01	2.08E-01	G
AC-228	3.0293E-01						
		911.07	2.479E-01	(P	8.652E-02	3.85E-02	G K
		968.90	3.607E-01	(P	1.253E-01	6.09E-02	G
		338.40	3.519E-01	(P	1.657E-01	6.67E-02	G
TH-227	-1.0507E-02						
		236.00	-1.051E-02	%(	3.014E-01	8.96E-02	G K
		256.25	-4.345E-02	% P	3.219E-01	9.52E-02	G
PA-234	-8.1238E-03						
		98.44	-8.124E-03	&(P	1.391E-01	4.11E-02	G K
		946.00	1.517E-02	% P	8.224E-02	2.30E-02	G
		131.28	-3.212E-02	% P	1.393E-01	4.17E-02	G
		94.67	-1.080E-01	% P	2.687E-01	8.11E-02	G
		883.24	2.847E-02	%	1.805E-01	5.14E-02	G
		926.70	-8.085E-03	%	1.633E-01	4.44E-02	G
		569.26	-3.115E-02	% P	1.971E-01	5.58E-02	G
TH-234	5.9831E-01						
		63.29	5.983E-01	%(P	4.149E+00	1.23E+00	G K
		92.80	6.472E-01	% P	1.375E+00	4.13E-01	G
		92.38	7.457E-01	% P	1.650E+00	4.95E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	2.5499E-01						
		59.54	2.550E-01	%(P	6.997E-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	4.4057E-02	4.4661E-02	1.4556E-01	1.4558E-01	1.629E-01
K-40		5.0516E+00	5.0516E+00	7.0926E-01	7.6751E-01	
MN-54	#A	-5.1322E-04	-5.1441E-04	5.1051E-02	5.1051E-02	2.058E-02
CO-57	#B	-4.4874E-03	-4.4995E-03	2.5182E-02	2.5183E-02	2.653E-02
CO-60	#B	-3.4558E-03	-3.4571E-03	1.2958E-01	1.2958E-01	2.188E-02
Sr-85	#A	-7.4544E-03	-7.5385E-03	2.4167E-02	2.4171E-02	2.682E-02
Kr-85	#A	-1.7209E+02	-1.7209E+02	5.5169E+02	5.5178E+02	6.191E+02
Y-88	#B	-2.5613E-03	-2.5789E-03	1.9713E-02	1.9714E-02	2.287E-02
NB-94	#B	-2.4886E-03	-2.4886E-03	1.8675E-02	1.8676E-02	2.203E-02
Ag-108M	#B	1.4111E-03	1.4111E-03	1.9712E-02	1.9712E-02	2.333E-02
CD-109	#A	6.0596E-01	6.0694E-01	1.0946E+00	1.0952E+00	1.200E+00

SN-113	#B	3.7300E-05	3.7536E-05	2.6129E-02	2.6129E-02	3.018E-02
SB-125	#B	4.2680E-02	4.2711E-02	4.8686E-02	4.8749E-02	7.260E-02
I-131	#B	-2.2405E-04	-2.4524E-04	1.3511E-01	1.3511E-01	2.407E-02
CS-134	#B	-8.2402E-03	-8.2482E-03	2.4586E-02	2.4590E-02	2.756E-02
CS-137	#A	2.7671E-03	2.7673E-03	2.1453E-02	2.1454E-02	2.519E-02
CE-139	#A	0.0000E+00	0.0000E+00	2.3620E-02	2.3620E-02	2.665E-02
EU-152	#B	1.8874E-02	1.8877E-02	7.7314E-02	7.7321E-02	8.637E-02
EU-154	#B	6.4763E-03	6.4778E-03	6.0419E-02	6.0420E-02	6.782E-02
EU-155	#B	7.4343E-03	7.4372E-03	1.3749E-01	1.3749E-01	1.544E-01
HG-203	#B	-6.4297E-04	-6.5308E-04	2.4231E-02	2.4231E-02	2.602E-02
TL-208		7.5477E-02	7.5477E-02	2.6748E-02	2.7104E-02	
PB-212		2.6543E-01	2.6543E-01	6.9812E-02	7.1492E-02	
PB-214		3.3000E-01	3.3000E-01	8.5172E-02	8.7300E-02	
BI-212		2.5073E-01	2.5073E-01	2.2077E-01	2.2125E-01	
BI-214		3.0935E-01	3.0935E-01	7.7617E-02	7.9667E-02	
RA-224	A	4.4097E-01	4.4097E-01	6.2377E-01	6.2429E-01	6.790E-01
RA-226	#	7.4030E-01	7.4030E-01	6.2271E-01	6.2419E-01	6.646E-01
AC-228		3.0293E-01	3.0293E-01	9.0115E-02	9.1815E-02	
TH-227	#B	-1.0507E-02	-1.0507E-02	2.6879E-01	2.6879E-01	3.014E-01
PA-234	#B	-8.1238E-03	-8.1238E-03	1.7448E-01	1.7448E-01	1.391E-01
TH-234	#B	5.9831E-01	5.9831E-01	3.6878E+00	3.6879E+00	4.149E+00
AM-241	#A	2.5499E-01	2.5499E-01	6.3198E-01	6.3213E-01	6.997E-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 (87.9 to 2000.7 keV) 6.5854774E+00 pCi/gm
Total Decayed Activity (87.9 to 2000.7 keV) 6.5854774E+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: 103F_3AUG2006_0929.An1

Sample description
FSS-OOL-04-04-009-F

Spectrum Filename: C:\GammaVision\Spectra\103F_3AUG2006_0929.An1

Acquisition information
Start time: 03-Aug-2006 09:29:18
Live time: 2000
Real time: 2002
Dead time: 0.10 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

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

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

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

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7300E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7300E+03) =
5.7803E+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	01-Aug-2006 16:15:00
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: 0.1602

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.91	91.	29.72	0.99	9.052E-03	74.81	9.600	8.179E-01	PB212
77.21	141.	16.22	0.99	1.011E-02	77.11	17.500	7.724E-01	PB212
					77.11	10.700	1.263E+00	PB214
92.96	98.	36.37	1.50	1.645E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
92.97	97.	36.97	1.50	1.631E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.37	155.	19.92	1.14	2.565E-02	185.99	3.280	1.321E+00	RA226
209.41	92.	36.90	0.97	2.471E-02				
238.98	1010.	3.79	1.09	2.318E-02	238.63	43.100	7.799E-01	PB212
241.37	134.	26.29	1.09	2.305E-02	241.00	3.900	1.167E+00	RA224
					241.92	7.470	6.104E-01	PB214
270.68	94.	30.08	1.17	2.149E-02				
295.32	278.	9.87	0.99	2.024E-02	295.22	19.200	5.496E-01	PB214
300.28	76.	31.94	1.01	2.000E-02				
327.56	69.	31.27	1.19	1.876E-02				
338.56	245.	11.87	1.14	1.829E-02	338.40	12.010	8.654E-01	AC228
351.94	471.	7.16	1.11	1.775E-02	351.99	37.100	5.520E-01	PB214
409.56	49.	38.53	1.60	1.574E-02				
463.40	77.	26.29	1.29	1.425E-02				
463.40	77.	26.29	1.29	1.425E-02	463.51	10.000	4.157E-01	SB125
486.91	48.	38.87	0.62	1.369E-02				
511.03	153.	13.07	0.99	1.317E-02	510.72	22.500	3.340E-01	TL208
583.33	330.	6.95	1.31	1.184E-02	583.14	86.000	2.496E-01	TL208
609.48	332.	8.76	1.25	1.144E-02	609.32	46.090	4.830E-01	BI214
661.47	61.	29.15	1.26	1.072E-02				
661.47	61.	29.15	1.26	1.072E-02	661.62	84.620	5.150E-02	CS137

727.21	70.	26.01	1.39	9.964E-03	727.17	11.800	4.597E-01	BI212
768.27	58.	40.36	0.96	9.554E-03				
795.15	30.	37.91	1.50	9.301E-03	795.76	85.400	PBC<MDA	CS134
911.46	280.	7.87	1.44	8.399E-03	911.07	29.000	8.876E-01	AC228
964.70	58.	20.40	1.54	8.051E-03	964.00	14.580	3.799E-01	EU152
969.29	143.	10.32	1.54	8.023E-03	968.90	17.460	7.981E-01	AC228
1120.50	90.	23.51	1.53	7.211E-03	1120.28	15.040	6.338E-01	BI214
1461.25	1431.	2.71	2.00	5.930E-03	1460.75	10.700	1.739E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1621.04	21.	35.18	0.88	5.488E-03	1620.56	2.750	1.064E+00	BI212
1765.24	43.	14.74	1.67	5.142E-03	1764.51	15.920	4.077E-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	
417.98	209.41	444.	92.	0.046	110.69	0.967	AC-228	
540.52	270.68	294.	94.	0.047	90.25	1.167	AC-228	s
599.70	300.28	211.	76.	0.038	95.81	1.011	PB-212	
654.26	327.56	173.	69.	0.035	93.80	1.193	AC-228	
818.26	409.56	123.	49.	0.024	115.60	1.595	AC-228	s
972.94	486.91	106.	48.	0.024	116.60	0.621	LA-140	s
1535.60	768.27	140.	58.	0.029	121.08	0.957	BI-214	M
1929.24	964.80	40.	58.	0.029	60.42	1.538	AC-228	D

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

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	347.	91.	0.045	89.16	0.993D
PB-212	153.39	77.11	334.	141.	0.071	48.66	0.995A
RA-226	371.90	186.37	395.	142.	0.071	59.76	1.141s
PB-212	477.08	238.96	525.	1032.	0.516	13.86	1.016
RA-224	482.98	241.91	650.	139.	0.070	81.64	1.500
PB-214	589.79	295.32	209.	274.	0.137	29.60	0.993
AC-228	676.25	338.56	231.	244.	0.122	35.62	1.143
PB-214	703.02	351.94	236.	465.	0.233	21.48	1.109s
SB-125	925.42	463.15	126.	71.	0.035	74.82	1.500
TL-208	1021.16	511.03	130.	127.	0.063	39.21	0.985s
TL-208	1165.76	583.33	86.	325.	0.163	20.84	1.311
BI-214	1218.05	609.48	154.	326.	0.163	26.29	1.249
CS-137	1321.64	661.28	97.	37.	0.019	117.86	1.500
BI-212	1453.50	727.21	90.	69.	0.035	78.03	1.394
CS-134	1589.36	795.15	49.	30.	0.015	113.74	1.500s
AC-228	1821.95	911.46	77.	277.	0.138	23.62	1.443
EU-152	1928.82	964.90	70.	46.	0.023	87.67	1.538
AC-228	1936.81	968.90	41.	143.	0.072	31.37	1.541D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	2239.97	1120.50	110.	88.	0.044	70.52	1.530
K-40	2921.37	1461.25	38.	1413.	0.706	8.13	2.003
BI-212	3240.89	1621.04	8.	21.	0.010	105.54	0.878s
BI-214	3529.24	1765.24	3.	43.	0.021	44.23	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		3.1418E-02					
			477.56	3.142E-02	&(	3.334E-01 9.75E-02	G
K-40		1.7385E+01					
			1460.75	1.739E+01	(P	3.884E-01 4.78E-01	G
MN-54		6.1790E-04					
			834.81	6.179E-04	%(P	4.725E-02 1.36E-02	G
CO-57		-2.9918E-03					
			122.07	-2.992E-03	%(P	5.097E-02 1.52E-02	G K
			136.43	-8.345E-02	%	4.099E-01 1.23E-01	G
CO-60		-7.5395E-03					
			1332.51	-7.539E-03	%(P	4.444E-02 1.24E-02	G K
			1173.23	1.620E-03	& P	5.770E-02 1.66E-02	G K
Sr-85		-2.1583E-02					
			514.00	-2.158E-02	%(	4.749E-02 1.44E-02	G
Kr-85		-4.8920E+02					
			513.99	-4.892E+02	%(	1.076E+03 3.26E+02	G
Y-88		-5.7294E-03					
			1836.01	-5.729E-03	%(P	3.152E-02 8.76E-03	G K
			898.02	-1.678E-03	% P	4.480E-02 1.28E-02	G
NB-94		0.0000E+00					
			871.10	0.000E+00	%(	3.782E-02 1.07E-02	G K
			702.50	4.935E-03	%	3.497E-02 1.02E-02	G K
Ag-108M		3.1535E-03					
			722.95	3.154E-03	%(	4.221E-02 1.22E-02	G K
			614.37	-8.072E-03	& P	4.049E-02 1.19E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		433.93	6.109E-03	%	3.177E-02	9.36E-03	G
CD-109	-2.7297E-02						
		88.04	-2.730E-02	&(	1.466E+00	4.34E-01	G
SN-113	1.2181E-02						
		391.71	1.218E-02	%(	5.057E-02	1.50E-02	G K
		255.04	2.214E-01	%	1.607E+00	4.78E-01	G
SB-125	1.1495E-01						
		427.95	2.276E-02	%(P	9.393E-02	2.78E-02	G K
		600.77	-2.203E-02	% P	1.842E-01	5.36E-02	G
		636.15	6.232E-02	% P	2.940E-01	8.62E-02	G
		463.51	3.878E-01	(P	3.022E-01	9.85E-02	G
		176.29	6.662E-02	%	5.689E-01	1.70E-01	G
I-131	2.9242E-03						
		364.48	2.924E-03	&(P	4.700E-02	1.38E-02	G K
		636.97	6.513E-02	%	5.241E-01	1.52E-01	G
		284.29	1.429E-01	& P	6.120E-01	1.83E-01	G
CS-134	1.6144E-02						
		604.66	4.733E-03	%(	4.002E-02	1.17E-02	G K
		795.76	2.919E-02	*(P	3.470E-02	1.11E-02	G
		569.29	-7.431E-03	% P	2.301E-01	6.59E-02	G
		801.84	6.130E-02	% P	3.538E-01	1.02E-01	G
CS-137	3.1951E-02						
		661.62	3.195E-02	(P	4.175E-02	1.30E-02	G
CE-139	2.8899E-03						
		165.85	2.890E-03	&(	4.866E-02	1.45E-02	G
EU-152	9.5890E-02						
		121.78	-9.410E-03	&(P	1.489E-01	4.43E-02	G K
		344.30	-2.433E-02	% P	1.111E-01	3.30E-02	G
		1408.08	8.773E-02	%	1.553E-01	4.80E-02	G
		964.00	3.071E-01	&(P	2.780E-01	9.08E-02	G
		1112.07	-2.808E-02	%	3.810E-01	1.10E-01	G
		778.90	1.108E-02	&	2.756E-01	7.88E-02	G
EU-154	4.5795E-03						
		123.10	4.579E-03	%(	1.062E-01	3.16E-02	G K
		1274.80	1.965E-02	&	1.293E-01	3.74E-02	G
		723.30	-5.666E-02	%	2.276E-01	6.75E-02	G
		1004.80	-4.285E-03	&	2.003E-01	5.63E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	4.6549E-02						
		86.45	4.655E-02	%(	2.465E-01	7.40E-02	G K
		105.31	3.401E-02	&	2.365E-01	7.07E-02	G
HG-203	1.6266E-02						
		279.17	1.627E-02	%(P	3.754E-02	1.13E-02	G K
		72.87	-5.500E-01	& P	2.297E+00	6.90E-01	G
		70.83	-6.982E-01	%	4.454E+00	1.33E+00	G
		82.50	-4.626E-01	&	4.097E+00	1.23E+00	G
TL-208	2.4960E-01						
		583.14	2.496E-01	(P	3.512E-02	1.76E-02	G
		510.72	3.340E-01	+ P	1.473E-01	5.29E-02	G
PB-212	7.9942E-01						
		238.63	8.063E-01	(P	8.553E-02	3.77E-02	G K
							Energy duplication
		77.11	6.243E-01	} P	3.878E-01	1.01E-01	G
		74.81	8.179E-01	(P	8.047E-01	2.51E-01	G
PB-214	5.5121E-01						
		351.99	5.520E-01	@(P	8.803E-02	4.00E-02	G K
		295.22	5.496E-01	(P	1.410E-01	5.50E-02	G
							Energy duplication
		77.11	0.000E+00	} P	9.562E-01	0.00E+00	G
		241.92	4.167E-01	%	5.825E-01	1.78E-01	G
BI-212	4.5974E-01						
		727.17	4.597E-01	(P	3.114E-01	1.20E-01	G K
		1620.56	1.064E+00	+ P	8.412E-01	3.75E-01	G
		785.42	7.939E-01	%	1.916E+00	5.77E-01	G
BI-214	4.6370E-01						
		609.32	4.830E-01	(P	8.968E-02	4.32E-02	G K
		1764.51	4.077E-01	@(P	1.063E-01	6.47E-02	G
		1120.28	6.338E-01	+ P	3.715E-01	1.52E-01	G
RA-224	1.2104E+00						
		241.00	1.210E+00	(	1.055E+00	3.29E-01	G
RA-226	1.3208E+00						
		185.99	1.321E+00	*(P	8.841E-01	2.87E-01	G
AC-228	8.5632E-01						
		911.07	8.876E-01	(P	1.399E-01	7.08E-02	G K
		968.90	7.982E-01	(P	1.810E-01	8.36E-02	G
		338.40	8.654E-01	(P	2.616E-01	1.03E-01	G

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

TH-227      -1.9085E-02
                          236.00-1.908E-02 %(  5.459E-01 1.63E-01 G K
                          256.25 1.042E-01 % P 4.907E-01 1.47E-01 G

PA-234       1.6209E-03
                           98.44 1.621E-03 %(P 2.271E-01 6.75E-02 G K
                          946.00 9.242E-02 % P 1.280E-01 4.07E-02 G
                          131.28 5.615E-02 & P 2.189E-01 6.58E-02 G
                           94.67-1.213E-01 % P 4.240E-01 1.28E-01 G
                          883.24 3.848E-02 %   3.278E-01 9.48E-02 G
                          926.70 4.530E-03 &   3.058E-01 8.60E-02 G
                          569.26-1.035E-02 % P 3.407E-01 9.76E-02 G

TH-234       1.7428E+00
                           63.29 1.743E+00 %(P 6.358E+00 1.91E+00 G K
                           92.80 1.544E+00 & P 2.178E+00 6.63E-01 G
                           92.38 1.801E+00 & P 2.587E+00 7.87E-01 G

AM-241      -2.8472E-03
                           59.54-2.847E-03 &(P 1.114E+00 3.30E-01 G
   ( - This peak used in the nuclide activity average.

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

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
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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	3.0725E-02	3.1418E-02	2.9250E-01	2.9250E-01	3.261E-01
K-40		1.7385E+01	1.7385E+01	1.4327E+00	1.7525E+00	
MN-54	#A	6.1555E-04	6.1790E-04	4.0889E-02	4.0889E-02	4.707E-02
CO-57	#B	-2.9786E-03	-2.9918E-03	5.0973E-02	5.0973E-02	5.075E-02
CO-60	#B	-7.5348E-03	-7.5395E-03	9.3561E-02	9.3562E-02	4.441E-02
Sr-85	#A	-2.1190E-02	-2.1583E-02	4.3130E-02	4.3148E-02	4.663E-02
Kr-85	#A	-4.8919E+02	-4.8920E+02	9.7757E+02	9.7798E+02	1.076E+03
Y-88	#B	-5.6658E-03	-5.7294E-03	2.7223E-02	2.7226E-02	3.117E-02
NB-94	#B	0.0000E+00	0.0000E+00	3.2210E-02	3.2210E-02	3.782E-02
Ag-108M	#B	3.1535E-03	3.1535E-03	3.6637E-02	3.6638E-02	4.221E-02
CD-109	#A	-2.7226E-02	-2.7297E-02	1.3013E+00	1.3013E+00	1.462E+00
SN-113	#B	1.2055E-02	1.2181E-02	4.5108E-02	4.5114E-02	5.005E-02
SB-125	#F	1.1482E-01	1.1495E-01	8.7554E-02	8.7808E-02	9.382E-02
I-131	#B	2.5216E-03	2.9242E-03	4.1375E-02	4.1375E-02	4.053E-02
CS-134	#B	1.6119E-02	1.6144E-02	1.8416E-02	1.8440E-02	3.995E-02
CS-137	#A	3.1948E-02	3.1951E-02	3.9066E-02	3.9110E-02	4.175E-02
CE-139	#A	2.8650E-03	2.8899E-03	4.3485E-02	4.3485E-02	4.824E-02
EU-152	#B	9.5865E-02	9.5890E-02	8.5056E-02	8.5222E-02	1.489E-01
EU-154	#B	4.5777E-03	4.5795E-03	9.4837E-02	9.4837E-02	1.061E-01
EU-155	#B	4.6518E-02	4.6549E-02	2.2186E-01	2.2187E-01	2.463E-01
HG-203	#B	1.5855E-02	1.6266E-02	3.4044E-02	3.4057E-02	3.659E-02
TL-208		2.4960E-01	2.4960E-01	5.2695E-02	5.4651E-02	
PB-212		7.9942E-01	7.9942E-01	1.1209E-01	1.2132E-01	
PB-214		5.5121E-01	5.5121E-01	1.0219E-01	1.0708E-01	
BI-212		4.5974E-01	4.5974E-01	3.6131E-01	3.6229E-01	
BI-214		4.6370E-01	4.6370E-01	1.2431E-01	1.2719E-01	
RA-224		1.2104E+00	1.2104E+00	9.8810E-01	9.9060E-01	1.055E+00
RA-226	#	1.3208E+00	1.3208E+00	8.6106E-01	8.6446E-01	
AC-228		8.5632E-01	8.5632E-01	1.5207E-01	1.5999E-01	
TH-227	#B	-1.9085E-02	-1.9085E-02	4.9019E-01	4.9020E-01	5.459E-01
PA-234	#B	1.6209E-03	1.6209E-03	2.0260E-01	2.0260E-01	2.271E-01
TH-234	#B	1.7428E+00	1.7428E+00	5.7188E+00	5.7196E+00	6.358E+00
AM-241	#A	-2.8472E-03	-2.8472E-03	4.9735E+00	4.9735E+00	1.114E+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_3AUG2006_0929.An1

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

Total Activity (1120.0 to 2000.7 keV) 2.3296362E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 2.3296366E+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_3AUG2006_1412.An1

Sample description
FSS-OOL-04-04-007-F

Spectrum Filename: C:\GammaVision\Spectra\103F_3AUG2006_1412.An1

Acquisition information
Start time: 03-Aug-2006 14:12:51
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: 1.7030E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7030E+03) =
5.8720E+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	01-Aug-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. 19 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2938

***** 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
74.97	123.	20.05	0.99	9.100E-03	72.87	6.400	PBC<MDA	HG203
					74.81	9.600	1.097E+00	PB212
93.13	104.	33.71	1.50	1.708E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	PBC<MDA	PA234
93.18	81.	40.79	1.50	1.645E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	PBC<MDA	PA234
129.57	106.	38.53	1.04	2.443E-02				
129.57	106.	38.53	1.04	2.443E-02	131.28	20.000	PBC<MDA	PA234
186.51	127.	25.60	1.31	2.565E-02	185.99	3.280	PBC<MDA	RA226
209.60	103.	25.56	1.31	2.470E-02				
239.01	1111.	3.49	1.09	2.318E-02	238.63	43.100	8.724E-01	PB212
241.43	165.	22.27	1.09	2.305E-02	241.00	3.900	1.454E+00	RA224
					241.92	7.470	7.609E-01	PB214
270.33	107.	22.80	0.92	2.151E-02				
295.15	238.	12.21	0.90	2.025E-02	295.22	19.200	4.765E-01	PB214
300.26	80.	24.62	1.60	2.000E-02				
328.17	87.	19.90	1.15	1.875E-02				
332.81	37.	40.87	1.15	1.855E-02				
338.84	201.	13.16	1.15	1.828E-02	338.40	12.010	7.217E-01	AC228
352.15	434.	6.95	1.17	1.775E-02	351.99	37.100	5.156E-01	PB214
463.12	71.	27.43	1.62	1.426E-02				
463.12	71.	27.43	1.62	1.426E-02	463.51	10.000	3.911E-01	SB125
511.09	172.	16.93	0.94	1.316E-02	510.72	22.500	3.902E-01	TL208
583.47	361.	7.39	1.53	1.184E-02	583.14	86.000	2.779E-01	TL208
609.65	320.	7.09	1.44	1.143E-02	609.32	46.090	4.719E-01	BI214

727.77	88.	19.60	1.25	9.958E-03	727.17	11.800	5.932E-01	BI212
768.34	51.	34.46	1.00	9.553E-03				
795.53	36.	32.16	0.62	9.303E-03				
795.53	36.	32.16	0.62	9.303E-03	795.76	85.400	PBC<MDA	CS134
860.52	72.	19.51	0.98	8.768E-03				
911.59	251.	7.41	1.53	8.398E-03	911.07	29.000	8.059E-01	AC228
965.19	56.	18.71	1.54	8.048E-03	964.00	14.580	3.777E-01	EU152
969.42	146.	9.46	1.54	8.022E-03	968.90	17.460	8.253E-01	AC228
1120.75	80.	17.98	1.83	7.210E-03	1120.28	15.040	5.743E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1461.38	1054.	3.16	1.91	5.930E-03	1460.75	10.700	1.294E+01	K40
1589.17	61.	18.30	0.71	5.569E-03				
1765.24	61.	15.27	2.09	5.142E-03	1764.51	15.920	5.887E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
153.78	77.25	323.	194.	0.097	44.87	0.995	PB-214	lD
258.31	129.57	648.	106.	0.053	115.58	1.042	AC-228	l
418.36	209.60	295.	103.	0.052	76.67	1.310	NP-239	s
539.81	270.33	222.	107.	0.054	68.41	0.920	AC-228	s
599.68	300.26	154.	80.	0.040	73.87	1.604	PB-212	s
654.90	327.88	203.	105.	0.052	72.03	1.123	AC-228	s
664.77	332.52	94.	37.	0.018	122.62	1.151	U-237	lD
1535.75	768.34	87.	51.	0.025	103.38	0.998	BI-214	sM
1720.09	860.52	44.	72.	0.036	58.54	0.979	TL-208	s
1930.43	965.26	33.	51.	0.026	62.99	1.539	AC-228	D
3177.16	1589.17	12.	61.	0.030	54.91	0.709	AC-228	s

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

This section based on library: 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	289.	128.	0.064	60.91	0.993D
PB-212	153.39	77.11	316.	201.	0.101	31.75	0.995A
PA-234	185.44	93.13	566.	104.	0.052	101.13	1.500s
RA-226	371.90	186.37	642.	115.	0.058	87.18	1.500s
PB-212	477.26	239.05	588.	1214.	0.607	13.16	0.975
RA-224	482.80	241.82	704.	147.	0.074	80.29	1.500
PB-214	482.87	241.86	717.	120.	0.060	98.69	1.500s
PB-214	589.44	295.15	246.	233.	0.117	36.64	0.901s
AC-228	676.83	338.84	193.	200.	0.100	39.49	1.145s
PB-214	703.45	352.15	188.	428.	0.214	20.85	1.168
SB-125	925.28	463.08	111.	69.	0.035	72.60	1.500s
TL-208	1021.29	511.09	210.	146.	0.073	50.78	0.937s
TL-208	1166.05	583.47	104.	357.	0.178	22.16	1.528
BI-214	1218.40	609.65	84.	314.	0.157	21.28	1.445
BI-212	1454.60	727.77	76.	88.	0.044	58.79	1.248

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CS-134	1589.70	795.32	52.	30.	0.015	113.50	1.500s
AC-228	1822.21	911.59	47.	247.	0.124	22.24	1.527
EU-152	1929.64	965.31	48.	50.	0.025	71.63	1.538
AC-228	1936.81	968.90	27.	145.	0.073	29.02	1.541D
BI-214	2240.47	1120.75	49.	79.	0.039	53.93	1.825
K-40	2921.63	1461.38	33.	1035.	0.517	9.49	1.914
BI-214	3529.24	1765.24	10.	61.	0.030	45.81	2.087

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		2.8843E-02					
			477.56	2.884E-02	&(	3.212E-01 9.37E-02	G
K-40		1.2936E+01					
			1460.75	1.294E+01	(P	3.697E-01 4.17E-01	G
MN-54		-2.7096E-03					
			834.81	-2.710E-03	&(P	4.135E-02 1.19E-02	G
CO-57		8.1835E-03					
			122.07	8.184E-03	%(P	4.973E-02 1.49E-02	G K
			136.43	-1.392E-01	%	4.049E-01 1.22E-01	G
CO-60		3.9156E-03					
			1332.51	3.916E-03	&(P	3.402E-02 9.34E-03	G K
			1173.23	9.152E-03	% P	4.613E-02 1.34E-02	G K
Sr-85		-8.4247E-03					
			514.00	-8.425E-03	%(	4.371E-02 1.30E-02	G
Kr-85		-1.9153E+02					
			513.99	-1.915E+02	%(	9.901E+02 2.94E+02	G
Y-88		2.5291E-03					
			1836.01	2.529E-03	&(P	2.192E-02 5.68E-03	G K
			898.02	7.450E-03	% P	3.483E-02 1.01E-02	G
NB-94		-5.7344E-05					
			871.10	-5.734E-05	&(	3.162E-02 8.85E-03	G K
			702.50	3.414E-03	&	2.647E-02 7.57E-03	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	7.5673E-04						
		722.95	7.567E-04	&(	3.970E-02	1.14E-02	G K
		614.37	-1.241E-02	% P	4.075E-02	1.21E-02	G
		433.93	9.852E-03	&	2.996E-02	8.94E-03	G
CD-109	1.2669E+00						
		88.04	1.267E+00	%(	1.867E+00	5.71E-01	G
SN-113	2.1021E-03						
		391.71	2.102E-03	%(	4.386E-02	1.27E-02	G K
		255.04	-4.720E-02	%	1.625E+00	4.80E-01	G
SB-125	9.5868E-02						
		427.95	-1.904E-03	%(P	9.714E-02	2.81E-02	G K
		600.77	2.145E-02	% P	1.925E-01	5.61E-02	G
		636.15	1.949E-02	% P	3.028E-01	8.72E-02	G
		463.51	3.853E-01	(P	2.890E-01	9.50E-02	G
		176.29	4.409E-02	%	5.457E-01	1.62E-01	G
I-131	-4.5144E-04						
		364.48	-4.514E-04	%(P	4.694E-02	1.37E-02	G K
		636.97	9.196E-02	%	5.272E-01	1.54E-01	G
		284.29	-1.047E-01	% P	6.379E-01	1.89E-01	G
CS-134	1.4191E-02						
		604.66	-4.578E-05	%(	3.947E-02	1.14E-02	G K
		795.76	3.046E-02	(P	3.618E-02	1.16E-02	G
		569.29	9.538E-02	% P	1.670E-01	5.10E-02	G
		801.84	9.961E-02	& P	3.154E-01	9.22E-02	G
CS-137	-7.7873E-03						
		661.62	-7.787E-03	%(P	4.392E-02	1.28E-02	G
CE-139	-6.6927E-03						
		165.85	-6.693E-03	&(	4.458E-02	1.33E-02	G
EU-152	1.2819E-01						
		121.78	2.346E-02	%(P	1.453E-01	4.34E-02	G K
		344.30	-2.040E-02	& P	1.199E-01	3.55E-02	G
		1408.08	6.870E-04	%	1.706E-01	4.68E-02	G
		964.00	3.382E-01	(P	2.370E-01	8.16E-02	G
		1112.07	3.223E-03	&	3.121E-01	8.82E-02	G
		778.90	-3.080E-02	%	2.714E-01	7.83E-02	G
EU-154	-8.8287E-03						
		123.10	-8.829E-03	&(	1.123E-01	3.35E-02	G K
		1274.80	2.523E-02	%	1.069E-01	3.10E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          723.30-1.285E-03 &   1.981E-01 5.68E-02 G
                         1004.80-1.261E-02 %   1.652E-01 4.62E-02 G

EU-155       1.5699E-01
                           86.45 1.570E-01 %(  2.367E-01 7.23E-02 G K
                          105.31 1.277E-03 %   2.357E-01 7.01E-02 G

HG-203       1.8435E-02
                          279.17 1.843E-02 %(P 3.605E-02 1.10E-02 G K
                           72.87-9.317E-02 % P 2.135E+00 6.36E-01 G
                           70.83-1.050E+00 %   4.366E+00 1.31E+00 G
                           82.50-3.558E-01 &   2.882E+00 8.57E-01 G

TL-208       2.7786E-01
                          583.14 2.779E-01  (P 3.919E-02 2.08E-02 G
                          510.72 3.902E-01 + P 1.882E-01 7.82E-02 G

PB-212       9.4522E-01
                          238.63 9.637E-01  (P 9.180E-02 4.28E-02 G K
                                                          Energy duplication
                           77.11 9.032E-01 } P 3.837E-01 9.56E-02 G
                           74.81 1.165E+00 + P 7.487E-01 2.42E-01 G

PB-214       5.0819E-01
                          351.99 5.156E-01  (P 8.025E-02 3.63E-02 G K
                          295.22 4.765E-01 @(P 1.546E-01 5.92E-02 G
                                                          Energy duplication
                           77.11 0.000E+00 } P 9.103E-01 0.00E+00 G
                          241.92 5.528E-01  (  5.882E-01 1.82E-01 G

BI-212       5.9323E-01
                          727.17 5.932E-01  (P 2.926E-01 1.17E-01 G K
                         1620.56 2.018E-01 % P 1.088E+00 3.05E-01 G
                          785.42 4.496E-02 %   1.714E+00 4.87E-01 G

BI-214       4.7187E-01
                          609.32 4.719E-01  (P 6.854E-02 3.42E-02 G K
                         1764.51 5.887E-01 + P 1.711E-01 9.48E-02 G
                         1120.28 5.743E-01 + P 2.597E-01 1.06E-01 G

RA-224       1.2999E+00
                          241.00 1.300E+00  (  1.115E+00 3.48E-01 G

RA-226       1.0851E+00
                          185.99 1.085E+00 *(P 1.138E+00 3.51E-01 G

AC-228       7.9390E-01
                          911.07 8.059E-01  (P 1.124E-01 6.06E-02 G K
                          968.90 8.237E-01  (P 1.513E-01 7.98E-02 G
                          338.40 7.217E-01 @(P 2.436E-01 9.56E-02 G
```

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	5.9988E-03						
		236.00	5.999E-03	%(	3.349E-01	9.92E-02	G K
		256.25	6.980E-02	% P	4.716E-01	1.40E-01	G
PA-234	6.4003E-02						
		98.44	-8.887E-02	%(P	2.151E-01	6.50E-02	G K
		946.00	1.113E-03	% P	1.457E-01	4.03E-02	G
		131.28	4.300E-02	& P	2.173E-01	6.51E-02	G
		94.67	3.116E-01	?(P	3.404E-01	1.05E-01	G
		883.24	6.248E-02	&	3.079E-01	8.98E-02	G
		926.70	-3.696E-02	%	3.473E-01	9.99E-02	G
		569.26	1.413E-01	% P	2.473E-01	7.55E-02	G
TH-234	5.8528E-01						
		63.29	5.853E-01	&(P	6.675E+00	1.99E+00	G K
		92.80	1.297E+00	& P	2.126E+00	6.45E-01	G
		92.38	1.469E+00	& P	2.549E+00	7.72E-01	G
AM-241	3.9451E-02						
		59.54	3.945E-02	%(P	1.175E+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

- -

***** 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	2.8180E-02	2.8843E-02	2.8104E-01	2.8105E-01	3.138E-01
K-40		1.2936E+01	1.2936E+01	1.2496E+00	1.4579E+00	
MN-54	#A	-2.6988E-03	-2.7096E-03	4.5128E-02	4.5128E-02	4.119E-02
CO-57	#B	8.1460E-03	8.1835E-03	4.4620E-02	4.4622E-02	4.950E-02
CO-60	#B	3.9131E-03	3.9156E-03	2.8012E-02	2.8013E-02	3.400E-02
Sr-85	#A	-8.2649E-03	-8.4247E-03	3.8874E-02	3.8877E-02	4.288E-02
Kr-85	#A	-1.9153E+02	-1.9153E+02	8.8057E+02	8.8064E+02	9.901E+02
Y-88	#B	2.4998E-03	2.5291E-03	1.7034E-02	1.7034E-02	2.167E-02
NB-94	#B	-5.7344E-05	-5.7344E-05	2.6543E-02	2.6543E-02	3.162E-02
Ag-108M	#B	7.5671E-04	7.5673E-04	3.4071E-02	3.4071E-02	3.970E-02
CD-109	#A	1.2634E+00	1.2669E+00	1.7126E+00	1.7141E+00	1.862E+00
SN-113	#B	2.0795E-03	2.1021E-03	3.8234E-02	3.8234E-02	4.339E-02
SB-125	#B	9.5751E-02	9.5868E-02	7.0884E-02	7.1102E-02	9.702E-02
I-131	#B	-3.8685E-04	-4.5144E-04	5.6159E-02	5.6159E-02	4.022E-02
CS-134	#B	1.4168E-02	1.4191E-02	1.6153E-02	1.6174E-02	3.940E-02
CS-137	#A	-7.7864E-03	-7.7873E-03	5.2382E-02	5.2384E-02	4.391E-02
CE-139	#A	-6.6326E-03	-6.6927E-03	3.9929E-02	3.9931E-02	4.418E-02
EU-152	#B	1.2816E-01	1.2819E-01	9.2817E-02	9.3089E-02	1.452E-01
EU-154	#B	-8.8252E-03	-8.8287E-03	1.0053E-01	1.0054E-01	1.123E-01
EU-155	#B	1.5688E-01	1.5699E-01	2.1693E-01	2.1710E-01	2.365E-01
HG-203	#B	1.7950E-02	1.8435E-02	3.2872E-02	3.2889E-02	3.510E-02
TL-208		2.7786E-01	2.7786E-01	6.2314E-02	6.4368E-02	
PB-212		9.4522E-01	9.4522E-01	1.2566E-01	1.3712E-01	
PB-214		5.0819E-01	5.0819E-01	1.0734E-01	1.1132E-01	
BI-212		5.9323E-01	5.9323E-01	3.5071E-01	3.5239E-01	
BI-214		4.7187E-01	4.7187E-01	1.0246E-01	1.0606E-01	
RA-224		1.2999E+00	1.2999E+00	1.0437E+00	1.0464E+00	1.115E+00
RA-226	#A	1.0851E+00	1.0851E+00	1.0525E+00	1.0544E+00	1.138E+00
AC-228		7.9390E-01	7.9390E-01	1.4323E-01	1.5046E-01	
TH-227	#B	5.9988E-03	5.9988E-03	2.9769E-01	2.9769E-01	3.349E-01
PA-234	#B	6.4003E-02	6.4003E-02	6.4937E-02	6.5034E-02	2.151E-01
TH-234	#B	5.8528E-01	5.8528E-01	5.9552E+00	5.9553E+00	6.675E+00
AM-241	#A	3.9450E-02	3.9451E-02	1.0470E+00	1.0470E+00	1.175E+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) 1.7826611E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.7826611E+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_3AUG2006_1451.An1

Sample description
FSS-OOL-04-04-005-F

Spectrum Filename: C:\GammaVision\Spectra\103F_3AUG2006_1451.An1

Acquisition information
Start time: 03-Aug-2006 14:52:29
Live time: 2000
Real time: 2002
Dead time: 0.10 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

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

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

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

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7900E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7900E+03) =
5.5866E+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	01-Aug-2006 15:25:00
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. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2144

***** 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
74.97	146.	18.90	0.99	9.052E-03	74.81	9.600	1.270E+00	PB212
87.12	103.	26.97	1.00	1.435E-02				
90.05	67.	40.08	1.00	1.545E-02				
93.73	83.	35.05	1.00	1.675E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	PBC<MDA	PA234
129.28	136.	27.90	0.87	2.439E-02				
185.83	128.	28.57	1.21	2.567E-02				
185.83	128.	28.57	1.21	2.567E-02	185.99	3.280	PBC<MDA	RA226
209.57	113.	26.84	1.01	2.470E-02				
238.97	979.	3.84	1.09	2.318E-02	238.63	43.100	7.301E-01	PB212
242.06	168.	15.68	1.10	2.301E-02	241.00	3.900	1.413E+00	RA224
					241.92	7.470	7.395E-01	PB214
270.40	64.	32.16	1.36	2.150E-02				
295.36	266.	9.93	1.23	2.024E-02	295.22	19.200	5.091E-01	PB214
300.54	70.	30.07	1.23	1.999E-02				
328.12	80.	32.95	1.56	1.874E-02				
338.45	233.	11.20	0.94	1.830E-02	338.40	12.010	7.965E-01	AC228
352.07	395.	7.09	1.10	1.775E-02	351.99	37.100	4.463E-01	PB214
463.26	76.	25.99	1.15	1.425E-02				
463.26	76.	25.99	1.15	1.425E-02	463.51	10.000	3.992E-01	SB125
511.15	168.	14.42	1.57	1.316E-02	510.72	22.500	3.590E-01	TL208
583.42	296.	7.08	1.24	1.184E-02	583.14	86.000	2.160E-01	TL208
609.49	314.	8.66	1.25	1.144E-02	609.32	46.090	4.396E-01	BI214
727.37	88.	18.60	1.52	9.963E-03	727.17	11.800	5.618E-01	BI212
835.75	31.	41.04	1.50	8.970E-03	834.81	99.978	PBC<MDA	MN54
837.62	68.	24.25	1.68	8.947E-03				

860.83	78.	20.72	0.84	8.765E-03				
911.49	260.	7.67	1.42	8.398E-03	911.07	29.000	7.968E-01	AC228
934.69	37.	33.32	1.41	8.243E-03				
964.75	33.	35.76	1.54	8.051E-03				
969.38	118.	12.26	1.54	8.022E-03	968.90	17.460	6.335E-01	AC228
1120.81	105.	21.94	1.67	7.209E-03	1120.28	15.040	7.176E-01	BI214
1461.40	1418.	2.78	1.85	5.930E-03	1460.75	10.700	1.664E+01	K40
1765.15	60.	13.85	1.83	5.142E-03	1764.51	15.920	5.573E-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	
173.42	87.07	335.	103.	0.052	80.90	1.001	PB-214	lD
179.26	90.00	323.	67.	0.033	120.25	1.003	PB-214	lD
418.30	209.57	370.	113.	0.057	80.53	1.009	AC-228	
539.96	270.40	190.	64.	0.032	96.47	1.357	AC-228	s
600.22	300.54	177.	70.	0.035	90.21	1.228	PB-212	s
655.38	328.12	235.	80.	0.040	98.85	1.555	AC-228	s
1674.29	837.62	99.	37.	0.018	124.72	1.675	J-135	sM
1720.71	860.83	55.	78.	0.039	62.17	0.835	TL-208	s
1868.41	934.69	45.	37.	0.019	99.97	1.415	BI-214	
1929.51	964.81	45.	43.	0.021	80.85	1.538	AC-228	D

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

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	327.	146.	0.073	56.71	0.993D
PB-212	153.39	77.11	350.	180.	0.090	36.84	0.995A
TH-234	185.37	93.10	883.	109.	0.054	102.33	1.500s
TH-234	185.41	93.12	821.	124.	0.062	88.84	1.500s
PA-234	185.38	93.10	638.	135.	0.067	83.44	1.500s
RA-226	371.54	186.19	670.	116.	0.058	88.31	1.500s
PB-212	477.10	238.97	556.	996.	0.498	14.49	0.999
RA-224	483.11	241.98	638.	141.	0.071	79.84	1.500
PB-214	483.26	242.05	318.	70.	0.035	109.28	0.983
PB-214	589.87	295.36	201.	262.	0.131	29.80	1.229
AC-228	676.04	338.45	196.	232.	0.116	33.61	0.937
PB-214	703.27	352.07	175.	389.	0.195	21.26	1.102s
SB-125	926.00	463.44	144.	63.	0.032	87.09	1.500
TL-208	1021.41	511.15	161.	141.	0.070	43.27	1.571s
TL-208	1165.94	583.42	73.	291.	0.146	21.25	1.240
BI-214	1218.07	609.49	143.	307.	0.154	25.97	1.254
BI-212	1453.81	727.37	72.	88.	0.044	55.81	1.523s
MN-54	1670.54	835.75	66.	31.	0.015	123.12	1.500
AC-228	1822.00	911.49	59.	257.	0.129	23.01	1.419s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1936.81	968.90	44.	118.	0.059	36.50	1.541D
BI-214	2240.59	1120.81	114.	103.	0.052	65.81	1.665
K-40	2921.66	1461.40	44.	1399.	0.700	8.33	1.851
BI-214	3529.06	1765.15	7.	60.	0.030	41.56	1.829

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		6.0546E-02					
			477.56	6.055E-02	&(	3.047E-01 8.99E-02	G
K-40		1.6641E+01					
			1460.75	1.664E+01	(P	3.996E-01 4.68E-01	G
MN-54		2.6008E-02					
			834.81	2.601E-02	(P	3.438E-02 1.08E-02	G
CO-57		7.4519E-03					
			122.07	7.452E-03	%(P	4.813E-02 1.44E-02	G K
			136.43	9.016E-02	%	3.782E-01 1.14E-01	G
CO-60		-8.7554E-03					
			1332.51	-8.755E-03	&(P	4.039E-02 1.12E-02	G K
			1173.23	-1.124E-03	& P	4.268E-02 1.19E-02	G K
Sr-85		-1.8409E-02					
			514.00	-1.841E-02	%(	4.294E-02 1.30E-02	G
Kr-85		-4.1610E+02					
			513.99	-4.161E+02	%(	9.706E+02 2.93E+02	G
Y-88		3.1780E-04					
			1836.01	3.178E-04	%(P	3.079E-02 8.10E-03	G K
			898.02	-2.519E-03	% P	3.452E-02 9.72E-03	G
NB-94		-9.3739E-04					
			871.10	-9.374E-04	&(	3.297E-02 9.34E-03	G K
			702.50	-5.119E-03	&	3.901E-02 1.14E-02	G K
Ag-108M		-9.5156E-03					
			722.95	-9.516E-03	%(	4.500E-02 1.33E-02	G K
			614.37	-2.782E-02	& P	4.563E-02 1.40E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		433.93	-6.154E-03	&	3.604E-02	1.06E-02	G
CD-109	4.7466E-01						
		88.04	4.747E-01	%(	1.452E+00	4.37E-01	G
SN-113	1.8081E-02						
		391.71	1.808E-02	%(	4.486E-02	1.35E-02	G K
		255.04	-1.063E-01	%	1.669E+00	4.95E-01	G
SB-125	9.7268E-02						
		427.95	1.684E-02	%(P	1.009E-01	2.97E-02	G K
		600.77	5.296E-02	% P	1.651E-01	4.91E-02	G
		636.15	9.378E-02	% P	2.579E-01	7.69E-02	G
		463.51	3.353E-01	(P	3.113E-01	9.93E-02	G
		176.29	1.315E-01	%	5.824E-01	1.75E-01	G
I-131	-6.2818E-03						
		364.48	-6.282E-03	&(P	4.556E-02	1.34E-02	G K
		636.97	2.067E-01	&	4.257E-01	1.29E-01	G
		284.29	-8.015E-03	% P	5.255E-01	1.54E-01	G
CS-134	-2.1304E-02						
		604.66	-2.130E-02	&(	4.178E-02	1.27E-02	G K
		795.76	2.321E-02	% P	4.065E-02	1.25E-02	G
		569.29	1.479E-03	% P	2.003E-01	5.73E-02	G
		801.84	-1.205E-02	% P	3.932E-01	1.10E-01	G
CS-137	1.9339E-02						
		661.62	1.934E-02	%(P	4.057E-02	1.23E-02	G
CE-139	8.5516E-03						
		165.85	8.552E-03	%(	4.679E-02	1.40E-02	G
EU-152	4.2650E-02						
		121.78	4.265E-02	%(P	1.421E-01	4.28E-02	G K
		344.30	1.363E-02	% P	1.154E-01	3.41E-02	G
		1408.08	5.939E-02	%	1.610E-01	4.78E-02	G
		964.00	-1.095E-01	% P	3.198E-01	9.52E-02	G
		1112.07	-3.264E-03	&	3.464E-01	9.89E-02	G
		778.90	6.388E-03	&	2.626E-01	7.49E-02	G
EU-154	2.9205E-02						
		123.10	2.921E-02	&(	1.080E-01	3.25E-02	G K
		1274.80	1.832E-02	%	1.166E-01	3.36E-02	G
		723.30	-8.307E-02	%	2.258E-01	6.78E-02	G
		1004.80	-3.474E-02	&	2.557E-01	7.44E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	2.6265E-02						
		86.45	2.627E-02	%(	2.080E-01	6.21E-02	G K
		105.31	2.809E-02	&	2.353E-01	7.03E-02	G
HG-203	-3.1723E-04						
		279.17	-3.172E-04	%(P	4.338E-02	1.28E-02	G K
		72.87	-2.841E-01	% P	2.099E+00	6.28E-01	G
		70.83	-9.459E-01	%	4.392E+00	1.32E+00	G
		82.50	3.223E-02	&	3.485E+00	1.04E+00	G
TL-208	2.1603E-01						
		583.14	2.160E-01	(P	3.142E-02	1.55E-02	G
		510.72	3.590E-01	+ P	1.575E-01	6.16E-02	G
PB-212	7.6596E-01						
		238.63	7.517E-01	(P	8.505E-02	3.68E-02	G K
							Energy duplication
		77.11	7.660E-01	} P	3.835E-01	9.41E-02	G
		74.81	1.270E+00	+ P	7.554E-01	2.45E-01	G
PB-214	4.6770E-01						
		351.99	4.463E-01	@(P	7.369E-02	3.21E-02	G K
		295.22	5.091E-01	(P	1.335E-01	5.14E-02	G
							Energy duplication
		77.11	0.000E+00	} P	8.765E-01	0.00E+00	G
		241.92	3.055E-01	-	3.769E-01	1.11E-01	G
BI-212	5.6183E-01						
		727.17	5.618E-01	*(P	2.721E-01	1.05E-01	G K
		1620.56	-1.287E-01	% P	9.563E-01	2.61E-01	G
		785.42	1.307E-01	%	1.778E+00	5.12E-01	G
BI-214	4.3963E-01						
		609.32	4.396E-01	(P	8.367E-02	3.89E-02	G K
		1764.51	5.573E-01	+ P	1.352E-01	8.14E-02	G
		1120.28	7.176E-01	+ P	3.650E-01	1.60E-01	G
RA-224	1.1866E+00						
		241.00	1.187E+00	&(	1.010E+00	3.16E-01	G
RA-226	1.0413E+00						
		185.99	1.041E+00	*(P	1.106E+00	3.41E-01	G
AC-228	7.9670E-01						
		911.07	7.968E-01	@(P	1.192E-01	6.19E-02	G K
		968.90	6.348E-01	- P	1.815E-01	7.73E-02	G
		338.40	7.965E-01	(P	2.334E-01	8.97E-02	G

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

TH-227      -1.7148E-01
                          236.00-1.715E-01 %(  3.877E-01 1.17E-01 G K
                          256.25-4.597E-03 & P 4.371E-01 1.29E-01 G

PA-234       1.3691E-01
                           98.44-1.565E-02 %(P 2.371E-01 7.07E-02 G K
                          946.00 8.676E-03 % P 1.775E-01 5.05E-02 G
                          131.28-7.430E-02 % P 2.238E-01 6.75E-02 G
                           94.67 3.839E-01 &(P 3.433E-01 1.07E-01 G
                          883.24-1.295E-03 %   2.943E-01 8.34E-02 G
                          926.70 6.144E-02 %   3.006E-01 8.74E-02 G
                          569.26 2.412E-02 % P 2.828E-01 8.14E-02 G

TH-234       1.6509E+00
                           63.29 1.265E+00 %(P 6.538E+00 1.95E+00 G K
                           92.80 1.890E+00 &(P 2.084E+00 6.40E-01 G
                           92.38 1.958E+00 &(P 2.543E+00 7.76E-01 G

AM-241      -2.1889E-01
                           59.54-2.189E-01 %(P 1.172E+00 3.51E-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	5.9012E-02	6.0546E-02	2.6958E-01	2.6960E-01	2.970E-01
K-40		1.6641E+01	1.6641E+01	1.4043E+00	1.7045E+00	
MN-54	A	2.5894E-02	2.6008E-02	3.2393E-02	3.2428E-02	3.423E-02
CO-57	#B	7.4141E-03	7.4519E-03	4.3177E-02	4.3179E-02	4.789E-02
CO-60	#B	-8.7492E-03	-8.7554E-03	7.1628E-02	7.1629E-02	4.036E-02
Sr-85	#A	-1.8024E-02	-1.8409E-02	3.8916E-02	3.8931E-02	4.204E-02
Kr-85	#A	-4.1610E+02	-4.1610E+02	8.7963E+02	8.7997E+02	9.706E+02
Y-88	#B	3.1374E-04	3.1780E-04	2.4289E-02	2.4289E-02	3.040E-02
NB-94	#B	-9.3739E-04	-9.3739E-04	2.8007E-02	2.8007E-02	3.297E-02
Ag-108M	#B	-9.5153E-03	-9.5156E-03	3.9822E-02	3.9826E-02	4.500E-02
CD-109	#A	4.7323E-01	4.7466E-01	1.3106E+00	1.3109E+00	1.447E+00
SN-113	#B	1.7867E-02	1.8081E-02	4.0533E-02	4.0546E-02	4.433E-02
SB-125	#B	9.7137E-02	9.7268E-02	8.6418E-02	8.6603E-02	1.008E-01
I-131	#B	-5.2972E-03	-6.2818E-03	4.6276E-02	4.6277E-02	3.842E-02
CS-134	#B	-2.1266E-02	-2.1304E-02	3.8112E-02	3.8132E-02	4.171E-02
CS-137	#A	1.9337E-02	1.9339E-02	3.6780E-02	3.6797E-02	4.056E-02
CE-139	#A	8.4667E-03	8.5516E-03	4.2036E-02	4.2039E-02	4.633E-02
EU-152	#B	4.2637E-02	4.2650E-02	1.2830E-01	1.2832E-01	1.421E-01
EU-154	#B	2.9192E-02	2.9205E-02	9.7444E-02	9.7457E-02	1.079E-01
EU-155	#B	2.6245E-02	2.6265E-02	1.8641E-01	1.8642E-01	2.079E-01
HG-203	#B	-3.0803E-04	-3.1723E-04	4.2863E-02	4.2863E-02	4.212E-02
TL-208		2.1603E-01	2.1603E-01	4.6586E-02	4.8245E-02	
PB-212		7.6596E-01	7.6596E-01	1.1234E-01	1.2082E-01	
PB-214		4.6770E-01	4.6770E-01	8.6900E-02	9.1044E-02	
BI-212	#	5.6183E-01	5.6183E-01	3.1532E-01	3.1701E-01	
BI-214		4.3963E-01	4.3963E-01	1.1659E-01	1.1935E-01	
RA-224	#	1.1866E+00	1.1866E+00	9.4736E-01	9.4986E-01	1.010E+00
RA-226	#A	1.0413E+00	1.0413E+00	1.0222E+00	1.0240E+00	1.106E+00
AC-228		7.9670E-01	7.9670E-01	1.6347E-01	1.6988E-01	
TH-227	#B	-1.7148E-01	-1.7148E-01	3.5227E-01	3.5241E-01	3.877E-01
PA-234	#B	1.3691E-01	1.3691E-01	1.1452E-01	1.1477E-01	2.371E-01
TH-234	#B	1.6509E+00	1.6509E+00	1.6762E+00	1.6787E+00	6.538E+00
AM-241	#A	-2.1889E-01	-2.1889E-01	1.0701E+00	1.0701E+00	1.172E+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) 1.9914467E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.9914581E+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_3AUG2006_1541.An1

Sample description
FSS-OOL-04-04-002-F

Spectrum Filename: C:\GammaVision\Spectra\103F_3AUG2006_1541.An1

Acquisition information
Start time: 03-Aug-2006 15:41:35
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: 1.4030E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4030E+03) =
7.1276E+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	01-Aug-2006 16:15:00
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: 0.2558

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.91	72.	33.13	0.99	9.052E-03	74.81	9.600	PBC<MDA	PB212
77.21	117.	21.19	0.99	1.011E-02	77.11	17.500	8.022E-01	PB212
					77.11	10.700	1.312E+00	PB214
87.48	104.	35.62	1.50	1.472E-02				
87.48	104.	35.62	1.50	1.472E-02	88.04	3.790	PBC<MDA	CD109
186.24	126.	23.76	1.22	2.566E-02	185.99	3.280	1.297E+00	RA226
209.09	106.	30.50	1.11	2.472E-02				
238.95	818.	4.20	1.09	2.318E-02	238.63	43.100	7.761E-01	PB212
242.07	109.	20.26	1.10	2.301E-02	241.00	3.900	1.166E+00	RA224
					241.92	7.470	6.102E-01	PB214
270.43	74.	38.96	1.00	2.150E-02				
295.45	174.	13.29	0.80	2.024E-02	295.22	19.200	4.198E-01	PB214
327.99	66.	34.79	1.02	1.874E-02				
338.60	182.	13.35	1.15	1.829E-02	338.40	12.010	7.910E-01	AC228
351.97	295.	8.47	1.18	1.775E-02	351.99	37.100	4.229E-01	PB214
511.05	156.	14.39	1.36	1.317E-02	510.72	22.500	4.203E-01	TL208
583.31	287.	10.03	1.12	1.184E-02	583.14	86.000	2.675E-01	TL208
609.42	272.	8.27	1.46	1.144E-02	609.32	46.090	4.851E-01	BI214
661.92	448.	6.91	1.37	1.072E-02	661.62	84.620	4.736E-01	CS137
727.69	116.	19.99	1.06	9.959E-03	727.17	11.800	9.437E-01	BI212
795.29	46.	28.01	1.20	9.305E-03				
795.29	46.	28.01	1.20	9.305E-03	795.76	85.400	5.602E-02	CS134
861.05	68.	28.67	0.69	8.764E-03				
911.52	173.	10.58	1.52	8.398E-03	911.07	29.000	6.706E-01	AC228
969.48	159.	12.89	2.00	8.022E-03	968.90	17.460	1.093E+00	AC228
1121.27	71.	22.31	1.69	7.207E-03	1120.28	15.040	6.137E-01	BI214
1461.41	926.	3.40	2.00	5.930E-03	1460.75	10.700	1.376E+01	K40

1765.36	45.	14.91	1.18	5.140E-03	1764.51	15.920	4.910E-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	
417.35	209.09	380.	106.	0.053	91.51	1.109	AC-228	s
540.00	270.43	293.	74.	0.037	116.87	0.999	AC-228	
655.13	327.99	188.	66.	0.033	104.37	1.023	AC-228	
1721.15	861.05	78.	68.	0.034	66.03	0.690	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	273.	72.	0.036	99.38	0.993D
PB-212	153.39	77.11	284.	117.	0.059	63.56	0.995A
CD-109	174.13	87.48	633.	104.	0.052	106.86	1.500s
RA-226	371.61	186.22	463.	120.	0.060	72.64	1.500s
PB-212	477.15	239.00	498.	807.	0.403	16.92	0.924
RA-224	482.61	241.73	572.	94.	0.047	112.05	1.500s
PB-214	590.05	295.45	175.	169.	0.085	39.87	0.804
AC-228	676.34	338.60	170.	181.	0.090	40.06	1.149s
PB-214	703.08	351.97	143.	289.	0.145	25.42	1.179
TL-208	1021.21	511.05	143.	129.	0.065	43.17	1.357s
TL-208	1165.72	583.31	147.	283.	0.141	30.09	1.123
BI-214	1217.94	609.42	84.	266.	0.133	24.81	1.463
CS-137	1322.93	661.92	132.	446.	0.223	20.73	1.366
BI-212	1454.45	727.69	103.	115.	0.058	59.98	1.061
CS-134	1589.39	795.16	33.	37.	0.019	81.30	1.500
AC-228	1822.08	911.52	57.	170.	0.085	31.74	1.521
AC-228	1937.98	969.48	73.	159.	0.080	38.68	1.999s
BI-214	2241.51	1121.27	62.	69.	0.035	66.94	1.691s
K-40	2921.69	1461.41	33.	907.	0.453	10.21	2.004
BI-214	3529.47	1765.36	3.	42.	0.021	44.72	1.179s

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		1.1659E-01					
			477.56	1.166E-01	%(	3.683E-01 1.10E-01	G
K-40		1.3762E+01					
			1460.75	1.376E+01	(P	4.481E-01 4.78E-01	G
MN-54		-1.4413E-03					
			834.81	-1.441E-03	&(P	3.720E-02 1.04E-02	G
CO-57		-1.8478E-02					
			122.07	-1.848E-02	%(P	5.810E-02 1.75E-02	G K
			136.43	6.199E-02	%	3.831E-01 1.14E-01	G
CO-60		6.6389E-04					
			1332.51	6.639E-04	&(P	4.546E-02 1.23E-02	G K
			1173.23	-1.058E-03	% P	7.099E-02 2.03E-02	G K
Sr-85		-1.0215E-02					
			514.00	-1.021E-02	%(	4.952E-02 1.47E-02	G
Kr-85		-2.3226E+02					
			513.99	-2.323E+02	%(	1.120E+03 3.32E+02	G
Y-88		3.9226E-03					
			1836.01	3.923E-03	%(P	2.773E-02 7.33E-03	G K
			898.02	-3.895E-03	& P	4.617E-02 1.31E-02	G
NB-94		1.0754E-03					
			871.10	1.075E-03	&(	3.756E-02 1.05E-02	G K
			702.50	5.890E-03	&	3.838E-02 1.11E-02	G K
Ag-108M		1.5503E-02					
			722.95	1.550E-02	%(	4.272E-02 1.28E-02	G K
			614.37	-7.110E-03	& P	4.180E-02 1.22E-02	G
			433.93	-6.331E-03	%	4.437E-02 1.31E-02	G
CD-109		1.7990E+00					
			88.04	1.799E+00	(	2.077E+00 6.41E-01	G
SN-113		1.7973E-03					
			391.71	1.797E-03	&(	6.207E-02 1.81E-02	G K
			255.04	-2.246E-02	%	1.984E+00 5.85E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-4.5327E-02						
		427.95	-4.533E-02	%(P	1.415E-01	4.23E-02	G K
		600.77	-4.261E-02	& P	2.230E-01	6.54E-02	G
		636.15	2.120E-02	& P	2.785E-01	7.90E-02	G
		463.51	1.245E-01	% P	4.061E-01	1.21E-01	G
		176.29	1.009E-02	%	5.133E-01	1.51E-01	G
I-131	-1.0616E-03						
		364.48	-1.062E-03	%(P	5.073E-02	1.47E-02	G K
		636.97	-3.049E-02	&	4.681E-01	1.32E-01	G
		284.29	1.853E-01	% P	6.728E-01	2.01E-01	G
CS-134	2.3678E-02						
		604.66	4.802E-03	%(	3.297E-02	9.52E-03	G K
		795.76	4.525E-02	(P	3.561E-02	1.23E-02	G
		569.29	6.893E-02	% P	2.119E-01	6.26E-02	G
		801.84	-1.073E-01	& P	4.302E-01	1.23E-01	G
CS-137	4.7364E-01						
		661.62	4.736E-01	(P	5.970E-02	3.28E-02	G
CE-139	1.6828E-02						
		165.85	1.683E-02	&(	4.444E-02	1.34E-02	G
EU-152	-5.4992E-02						
		121.78	-5.499E-02	%(P	1.697E-01	5.10E-02	G K
		344.30	-1.406E-02	% P	1.392E-01	4.10E-02	G
		1408.08	-2.983E-03	%	1.782E-01	4.82E-02	G
		964.00	-2.737E-01	% P	4.198E-01	1.29E-01	G
		1112.07	4.217E-02	&	3.544E-01	1.02E-01	G
		778.90	9.661E-02	%	2.540E-01	7.58E-02	G
EU-154	-4.2027E-02						
		123.10	-4.203E-02	%(	1.149E-01	3.47E-02	G K
		1274.80	3.865E-03	%	1.112E-01	3.06E-02	G
		723.30	6.802E-02	%	1.988E-01	5.92E-02	G
		1004.80	-6.032E-02	&	2.448E-01	7.15E-02	G
EU-155	1.2457E-02						
		86.45	1.246E-02	&(	2.313E-01	6.87E-02	G K
		105.31	3.877E-02	%	2.468E-01	7.37E-02	G
HG-203	-1.2747E-03						
		279.17	-1.275E-03	&(P	4.484E-02	1.32E-02	G K
		72.87	-7.388E-01	% P	2.667E+00	8.02E-01	G
		70.83	-5.217E-01	%	4.967E+00	1.48E+00	G
		82.50	-1.240E+00	%	4.474E+00	1.34E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.6749E-01						
		583.14	2.675E-01	(P	5.601E-02	2.72E-02	G
		510.72	4.203E-01	+ P	1.897E-01	7.30E-02	G
PB-212	7.8597E-01						
		238.63	7.772E-01	(P	1.028E-01	4.45E-02	G K
							Energy duplication
		77.11	6.388E-01	} P	4.418E-01	1.35E-01	G
		74.81	7.956E-01	(P	8.839E-01	2.75E-01	G
PB-214	4.2182E-01						
		351.99	4.229E-01	(P	8.541E-02	3.65E-02	G K
		295.22	4.198E-01	(P	1.592E-01	5.72E-02	G
							Energy duplication
		77.11	1.013E-01	} P	1.081E+00	2.56E-01	G
		241.92	4.205E-01	%	6.402E-01	1.96E-01	G
BI-212	9.4370E-01						
		727.17	9.437E-01	(P	4.092E-01	1.90E-01	G K
		1620.56	3.739E-01	% P	1.210E+00	3.50E-01	G
		785.42	2.386E-01	%	1.793E+00	5.14E-01	G
BI-214	4.8660E-01						
		609.32	4.851E-01	(P	8.319E-02	4.11E-02	G K
		1764.51	4.910E-01	(P	1.311E-01	7.90E-02	G
		1120.28	6.137E-01	+ P	3.496E-01	1.41E-01	G
RA-224	1.0081E+00						
		241.00	1.008E+00	(	1.222E+00	3.77E-01	G
RA-226	1.3707E+00						
		185.99	1.371E+00	*(P	1.179E+00	3.68E-01	G
AC-228	7.0588E-01						
		911.07	6.706E-01	(P	1.502E-01	7.24E-02	G K
		968.90	1.093E+00	+ P	2.922E-01	1.41E-01	G
		338.40	7.910E-01	@(P	2.785E-01	1.06E-01	G
TH-227	-2.6664E-01						
		236.00	-2.666E-01	%(	4.640E-01	1.41E-01	G K
		256.25	3.558E-03	% P	4.994E-01	1.46E-01	G
PA-234	8.6088E-02						
		98.44	8.609E-02	%(P	2.309E-01	6.96E-02	G K
		946.00	-3.877E-02	& P	2.339E-01	6.78E-02	G
		131.28	-5.101E-02	% P	2.375E-01	7.11E-02	G
		94.67	-1.286E-02	& P	4.399E-01	1.31E-01	G
		883.24	-9.937E-03	&	3.781E-01	1.08E-01	G
		926.70	-8.433E-02	%	4.193E-01	1.22E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.021E-01 % P 3.137E-01 9.27E-02 G

TH-234      -9.2328E-02
                           63.29-9.233E-02 %(P 7.626E+00 2.25E+00 G K
                           92.80 1.188E+00 % P 2.399E+00 7.23E-01 G
                           92.38-5.523E-01 & P 2.890E+00 8.49E-01 G

AM-241       4.7404E-01
                           59.54 4.740E-01 %(P 1.347E+00 4.06E-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	1.1364E-01	1.1659E-01	3.2947E-01	3.2954E-01	3.590E-01
K-40		1.3762E+01	1.3762E+01	1.4337E+00	1.6413E+00	
MN-54	#A	-1.4350E-03	-1.4413E-03	5.4112E-02	5.4112E-02	3.704E-02
CO-57	#B	-1.8385E-02	-1.8478E-02	5.3642E-02	5.3652E-02	5.780E-02
CO-60	#B	6.6342E-04	6.6389E-04	3.7030E-02	3.7030E-02	4.543E-02

Sr-85	#A	-1.0001E-02	-1.0215E-02	4.4016E-02	4.4020E-02	4.848E-02
Kr-85	#A	-2.3226E+02	-2.3226E+02	9.9525E+02	9.9534E+02	1.120E+03
Y-88	#B	3.8725E-03	3.9226E-03	2.1980E-02	2.1981E-02	2.738E-02
NB-94	#B	1.0754E-03	1.0754E-03	3.1630E-02	3.1630E-02	3.756E-02
Ag-108M	#B	1.5502E-02	1.5503E-02	3.8260E-02	3.8271E-02	4.272E-02
CD-109	#A	1.7936E+00	1.7990E+00	1.9224E+00	1.9250E+00	2.070E+00
SN-113	#B	1.7760E-03	1.7973E-03	5.4355E-02	5.4355E-02	6.134E-02
SB-125	#B	-4.5266E-02	-4.5327E-02	1.2744E-01	1.2747E-01	1.413E-01
I-131	#B	-8.9529E-04	-1.0616E-03	1.4148E-01	1.4148E-01	4.278E-02
CS-134	#B	2.3635E-02	2.3678E-02	1.9294E-02	1.9343E-02	3.291E-02
CS-137		4.7358E-01	4.7364E-01	9.8505E-02	1.0227E-01	
CE-139	#A	1.6661E-02	1.6828E-02	4.0197E-02	4.0209E-02	4.400E-02
EU-152	#B	-5.4976E-02	-5.4992E-02	1.6082E-01	1.6084E-01	1.696E-01
EU-154	#B	-4.2008E-02	-4.2027E-02	1.0401E-01	1.0404E-01	1.149E-01
EU-155	#B	1.2447E-02	1.2457E-02	2.0603E-01	2.0603E-01	2.312E-01
HG-203	#B	-1.2378E-03	-1.2747E-03	4.0878E-02	4.0878E-02	4.354E-02
TL-208		2.6749E-01	2.6749E-01	8.1716E-02	8.3178E-02	
PB-212		7.8597E-01	7.8597E-01	1.3492E-01	1.4243E-01	
PB-214		4.2182E-01	4.2182E-01	1.0198E-01	1.0488E-01	
BI-212		9.4370E-01	9.4370E-01	5.6848E-01	5.7111E-01	
BI-214		4.8660E-01	4.8660E-01	1.2367E-01	1.2685E-01	
RA-224	#A	1.0081E+00	1.0081E+00	1.1296E+00	1.1311E+00	1.222E+00
RA-226	#	1.3707E+00	1.3707E+00	1.1034E+00	1.1063E+00	1.179E+00
AC-228		7.0588E-01	7.0588E-01	1.8245E-01	1.8700E-01	
TH-227	#B	-2.6664E-01	-2.6664E-01	4.2396E-01	4.2424E-01	4.640E-01
PA-234	#B	8.6088E-02	8.6088E-02	2.0892E-01	2.0897E-01	2.309E-01
TH-234	#B	-9.2328E-02	-9.2328E-02	1.1935E+01	1.1935E+01	7.626E+00
AM-241	#A	4.7404E-01	4.7404E-01	1.2183E+00	1.2186E+00	1.347E+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) 1.7846844E+01 pCi/gm
Total Decayed Activity (87.4 to 2000.7 keV) 1.7846903E+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_3AUG2006_0852.An1

Sample description
FSS-OOL-04-04-007-F-A

Spectrum Filename: C:\GammaVision\Spectra\107F_3AUG2006_0852.An1

Acquisition information
Start time: 03-Aug-2006 08:52:51
Live time: 2000
Real time: 2002
Dead time: 0.11 %
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: 1.9420E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9420E+03) =
5.1493E+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	01-Aug-2006 19:14:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2982

***** 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
71.34	69.	41.43	1.18	2.659E-02				
74.63	190.	16.71	1.18	2.842E-02	74.81	9.600	4.726E-01	PB212
77.04	340.	10.25	1.18	2.956E-02	77.11	10.700	7.367E-01	PB214
					77.11	17.500	4.569E-01	PB212
92.88	91.	35.67	1.50	3.438E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	PBC<MDA	PA234
186.36	207.	20.06	1.78	3.607E-02	185.99	3.280	1.216E+00	RA226
238.79	533.	5.34	1.30	3.189E-02	238.63	43.100	2.618E-01	PB212
242.38	153.	15.06	1.30	3.160E-02	241.00	3.900	8.497E-01	RA224
					241.92	7.470	4.470E-01	PB214
270.45	61.	35.06	1.05	2.943E-02				
295.36	327.	11.60	1.34	2.767E-02	295.22	19.200	4.218E-01	PB214
338.67	133.	22.18	1.69	2.499E-02	338.40	12.010	3.005E-01	AC228
352.05	639.	5.04	1.35	2.425E-02	351.99	37.100	4.903E-01	PB214
463.06	33.	36.00	1.50	1.953E-02	463.51	10.000	PBC<MDA	SB125
510.97	108.	16.17	2.04	1.808E-02	510.72	22.500	1.853E-01	TL208
536.19	46.	33.96	1.27	1.740E-02				
583.34	203.	11.06	1.66	1.629E-02	583.14	86.000	9.868E-02	TL208
609.66	399.	6.76	1.55	1.574E-02	609.32	46.090	3.785E-01	BI214
727.53	97.	19.25	2.57	1.374E-02	727.17	11.800	4.171E-01	BI212
768.69	75.	22.73	1.33	1.318E-02				
786.73	29.	38.62	0.66	1.297E-02	785.42	2.000	PBC<MDA	BI212
860.54	38.	31.54	0.46	1.211E-02				
911.67	154.	10.48	1.86	1.160E-02	911.07	29.000	3.092E-01	AC228
968.26	125.	15.86	1.08	1.110E-02	968.90	17.460	4.421E-01	AC228
1120.95	107.	15.78	1.40	9.965E-03	1120.28	15.040	4.943E-01	BI214

1281.85	37.	32.54	0.65	9.029E-03				
1461.28	626.	4.21	2.35	8.189E-03	1460.75	10.700	4.929E+00	K40
1765.13	89.	11.16	1.96	7.082E-03	1764.51	15.920	5.412E-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	
142.35	71.37	377.	69.	0.035	124.28	1.175	W-187	lD
540.52	270.45	173.	61.	0.031	105.17	1.051	AC-228	
1071.97	536.19	66.	46.	0.023	101.87	1.274	BA-140	
1536.96	768.69	55.	75.	0.037	54.49	1.332	BI-214	s
1720.64	860.54	33.	38.	0.019	80.53	0.463	TL-208	s
2563.27	1281.85	27.	37.	0.019	76.58	0.654	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
HG-203	146.22	73.28	1006.	-126.	-0.063	110.40	1.500
PB-212	149.29	74.81	410.	187.	0.094	49.71	1.178D
PB-214	153.89	77.11	771.	128.	0.064	88.59	1.500A
PB-212	153.89	77.11	436.	195.	0.097	49.69	1.179A
RA-226	372.36	186.36	506.	207.	0.104	60.19	1.782s
PB-212	476.89	238.63	154.	517.	0.259	16.00	1.297D
PB-214	483.47	241.92	230.	168.	0.084	44.23	1.299D
PB-214	590.34	295.36	331.	322.	0.161	34.81	1.343
AC-228	676.96	338.67	226.	130.	0.065	66.55	1.693s
PB-214	703.72	352.05	142.	634.	0.317	15.11	1.353s
SB-125	925.72	463.06	67.	33.	0.016	108.00	1.500s
TL-208	1021.54	510.97	144.	108.	0.054	48.50	2.040s
TL-208	1166.25	583.34	93.	199.	0.099	33.18	1.655s
BI-214	1218.90	609.66	95.	395.	0.197	20.27	1.554
BI-212	1454.62	727.53	57.	97.	0.049	57.74	2.573s
BI-212	1573.03	786.73	39.	29.	0.014	115.86	0.663s
AC-228	1822.90	911.67	35.	150.	0.075	31.44	1.865
AC-228	1936.08	968.26	65.	123.	0.062	47.58	1.083s
BI-214	2241.46	1120.95	49.	107.	0.053	47.34	1.401s
K-40	2922.16	1461.28	22.	621.	0.310	12.63	2.350
BI-214	3529.92	1765.13	4.	88.	0.044	33.48	1.964

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

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

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		9.1096E-02					
			477.56	9.110E-02	%(	1.632E-01 5.00E-02	G
K-40		4.9295E+00					
			1460.75	4.929E+00	(P	1.956E-01 2.09E-01	G
MN-54		-9.2622E-04					
			834.81	-9.262E-04	&(P	2.377E-02 6.76E-03	G
CO-57		8.5081E-03					
			122.07	8.508E-03	%(P	2.408E-02 7.26E-03	G K
			136.43	-2.574E-04	% P	2.090E-01 6.20E-02	G
CO-60		3.0140E-03					
			1332.51	3.014E-03	%(P	1.904E-02 5.13E-03	G K
			1173.23	3.977E-03	% P	2.211E-02 6.17E-03	G K
Sr-85		-1.0559E-02					
			514.00	-1.056E-02	&(	2.619E-02 7.89E-03	G
Kr-85		-2.6675E+02					
			513.99	-2.668E+02	&(P	5.992E+02 1.79E+02	G
Y-88		1.9533E-03					
			1836.01	1.953E-03	%(P	1.494E-02 3.84E-03	G K
			898.02	-6.221E-03	& P	2.609E-02 7.53E-03	G
NB-94		4.7747E-03					
			871.10	4.775E-03	%(P	1.536E-02 4.50E-03	G K
			702.50	3.991E-03	& P	1.967E-02 5.73E-03	G K
Ag-108M		0.0000E+00					
			722.95	0.000E+00	&(	3.255E-02 9.42E-03	G K
			614.37	-2.163E-02	%	2.948E-02 9.14E-03	G
			433.93	-1.941E-03	& P	1.928E-02 5.54E-03	G
CD-109		-2.9089E-02					
			88.04	-2.909E-02	%(P	6.902E-01 2.05E-01	G
SN-113		2.8078E-03					
			391.71	2.808E-03	%(P	2.589E-02 7.52E-03	G K
			255.04	-1.176E-01	&	9.045E-01 2.68E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	2.6480E-02						
		427.95	-3.928E-03	&(P	5.719E-02	1.64E-02	G K
		600.77	-5.736E-03	& P	8.323E-02	2.31E-02	G
		636.15	4.267E-02	& P	1.271E-01	3.75E-02	G
		463.51	1.165E-01	*(P	1.453E-01	4.55E-02	G
		176.29	5.124E-02	% P	2.605E-01	7.75E-02	G
I-131	-3.1273E-03						
		364.48	-3.127E-03	&(	2.414E-02	7.08E-03	G K
		636.97	6.842E-03	%	2.614E-01	7.37E-02	G
		284.29	9.847E-03	%	3.610E-01	1.06E-01	G
CS-134	-3.2205E-03						
		604.66	-3.220E-03	&(P	5.130E-02	1.52E-02	G K
		795.76	8.009E-03	% P	1.791E-02	5.39E-03	G
		569.29	-1.833E-02	%	1.289E-01	3.76E-02	G
		801.84	7.059E-02	% P	1.645E-01	4.94E-02	G
CS-137	1.0850E-04						
		661.62	1.085E-04	&(P	2.432E-02	6.85E-03	G
CE-139	8.8918E-04						
		165.85	8.892E-04	%(P	2.065E-02	6.09E-03	G
EU-152	2.3491E-02						
		121.78	2.349E-02	%(P	7.257E-02	2.18E-02	G K
		344.30	1.143E-02	% P	5.378E-02	1.58E-02	G
		1408.08	-2.763E-03	% P	1.206E-01	3.31E-02	G
		964.00	1.983E-02	& P	1.158E-01	3.29E-02	G
		1112.07	-2.620E-03	& P	1.371E-01	3.70E-02	G
		778.90	-2.107E-03	& P	1.398E-01	3.88E-02	G
EU-154	-9.8313E-03						
		123.10	-9.831E-03	%(P	5.650E-02	1.69E-02	G K
		1274.80	-3.526E-03	% P	5.873E-02	1.61E-02	G
		723.30	-3.616E-02	& P	1.171E-01	3.47E-02	G
		1004.80	-7.472E-04	& P	1.300E-01	3.64E-02	G
EU-155	5.3112E-02						
		86.45	5.311E-02	%(	8.892E-02	2.71E-02	G K
		105.31	2.000E-02	% P	1.071E-01	3.20E-02	G
HG-203	-3.9431E-03						
		279.17	-3.943E-03	&(P	2.471E-02	7.31E-03	G K
		72.87	1.894E-02	& P	7.834E-01	2.35E-01	G
		70.83	-9.688E-01	+	1.161E+00	3.57E-01	G
		82.50	-4.299E-02	%	1.420E+00	4.23E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	9.8676E-02						
		583.14	9.868E-02	@(P	2.371E-02	1.12E-02	G
		510.72	1.853E-01	+ P	1.002E-01	3.93E-02	G
PB-212	2.6191E-01						
		238.63	2.619E-01	(P	3.061E-02	1.44E-02	G K
							Energy duplication
		77.11	2.619E-01	}	1.345E-01	4.34E-02	G
		74.81	4.764E-01	+ P	2.468E-01	8.06E-02	G
PB-214	4.9118E-01						
		351.99	4.903E-01	@(P	4.502E-02	2.49E-02	G K
		295.22	4.218E-01	- P	1.146E-01	4.96E-02	G
							Energy duplication
		77.11	2.810E-01	} P	2.906E-01	8.30E-02	G
		241.92	4.957E-01	(P	2.160E-01	7.37E-02	G
BI-212	4.1714E-01						
		727.17	4.171E-01	*(P	1.623E-01	8.13E-02	G K
		1620.56	2.254E-01	% P	5.426E-01	1.61E-01	G
		785.42	7.765E-01	+ P	8.543E-01	3.13E-01	G
BI-214	3.7852E-01						
		609.32	3.785E-01	(P	4.624E-02	2.59E-02	G K
		1764.51	5.412E-01	+ P	7.632E-02	6.10E-02	G
		1120.28	4.943E-01	+ P	1.647E-01	7.87E-02	G
RA-224	-3.1503E-02						
		241.00	-3.150E-02	&(P	6.137E-01	1.82E-01	G
RA-226	1.2164E+00						
		185.99	1.216E+00	*(	6.319E-01	2.44E-01	G
AC-228	3.0663E-01						
		911.07	3.092E-01	(P	6.294E-02	3.33E-02	G K
		968.90	4.421E-01	+ P	1.447E-01	7.14E-02	G
		338.40	3.005E-01	*(P	1.687E-01	6.84E-02	G
TH-227	-3.3613E-02						
		236.00	-3.361E-02	%(P	1.988E-01	5.93E-02	G K
		256.25	4.835E-02	& P	2.798E-01	8.30E-02	G
PA-234	8.4843E-04						
		98.44	8.484E-04	%(	8.668E-02	2.57E-02	G K
		946.00	-1.556E-02	%	1.142E-01	3.28E-02	G
		131.28	-1.448E-02	&	1.153E-01	3.44E-02	G
		94.67	1.286E-04	%	1.642E-01	4.88E-02	G
		883.24	4.999E-02	%	1.225E-01	3.67E-02	G
		926.70	7.668E-04	&	1.771E-01	4.92E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-2.703E-02 %   1.909E-01 5.56E-02 G

TH-234       4.0236E-01
                           63.29 4.024E-01 %(P 1.111E+00 3.33E-01 G K
                           92.80 6.161E-01 % P 8.785E-01 2.67E-01 G
                           92.38 6.416E-01 % P 1.061E+00 3.23E-01 G

AM-241      -1.2219E-02
                           59.54-1.222E-02 &(P 1.476E-01 4.39E-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	8.9260E-02	9.1096E-02	1.4988E-01	1.4997E-01	1.599E-01
K-40		4.9295E+00	4.9295E+00	6.2724E-01	6.9151E-01	
MN-54	#A	-9.2300E-04	-9.2622E-04	3.4601E-02	3.4601E-02	2.369E-02
CO-57	#B	8.4739E-03	8.5081E-03	2.1768E-02	2.1774E-02	2.398E-02
CO-60	#B	3.0123E-03	3.0140E-03	1.5379E-02	1.5380E-02	1.902E-02

Sr-85	#A	-1.0383E-02	-1.0559E-02	2.3675E-02	2.3684E-02	2.575E-02
Kr-85	#A	-2.6675E+02	-2.6675E+02	6.5812E+02	6.5830E+02	5.991E+02
Y-88	#B	1.9335E-03	1.9533E-03	1.1514E-02	1.1515E-02	1.479E-02
NB-94	#B	4.7747E-03	4.7747E-03	1.3497E-02	1.3500E-02	1.536E-02
Ag-108M	#B	0.0000E+00	0.0000E+00	2.8263E-02	2.8263E-02	3.255E-02
CD-109	#A	-2.9020E-02	-2.9089E-02	6.9551E-01	6.9552E-01	6.886E-01
SN-113	#B	2.7814E-03	2.8078E-03	2.2549E-02	2.2550E-02	2.565E-02
SB-125	#B	2.6452E-02	2.6480E-02	3.1063E-02	3.1102E-02	5.713E-02
I-131	#B	-2.7317E-03	-3.1273E-03	2.1227E-02	2.1228E-02	2.108E-02
CS-134	#B	-3.2158E-03	-3.2205E-03	5.2937E-02	5.2937E-02	5.122E-02
CS-137	#A	1.0849E-04	1.0850E-04	2.0546E-02	2.0546E-02	2.432E-02
CE-139	#A	8.8217E-04	8.8918E-04	1.8270E-02	1.8270E-02	2.049E-02
EU-152	#B	2.3485E-02	2.3491E-02	6.5539E-02	6.5552E-02	7.255E-02
EU-154	#B	-9.8279E-03	-9.8313E-03	5.3277E-02	5.3280E-02	5.648E-02
EU-155	#B	5.3080E-02	5.3112E-02	8.1289E-02	8.1343E-02	8.887E-02
HG-203	#B	-3.8522E-03	-3.9431E-03	2.6777E-02	2.6778E-02	2.414E-02
TL-208	#	9.8676E-02	9.8676E-02	3.3490E-02	3.3994E-02	
PB-212		2.6191E-01	2.6191E-01	4.3190E-02	4.5876E-02	
PB-214		4.9118E-01	4.9118E-01	7.4795E-02	8.0223E-02	
BI-212		4.1714E-01	4.1714E-01	2.4403E-01	2.4527E-01	
BI-214		3.7852E-01	3.7852E-01	7.7557E-02	8.0715E-02	
RA-224	#A	-3.1503E-02	-3.1503E-02	1.2670E+00	1.2670E+00	6.137E-01
RA-226	#	1.2164E+00	1.2164E+00	7.3221E-01	7.3572E-01	
AC-228		3.0663E-01	3.0663E-01	9.9150E-02	1.0079E-01	
TH-227	#B	-3.3613E-02	-3.3613E-02	1.8345E-01	1.8346E-01	1.988E-01
PA-234	#B	8.4843E-04	8.4843E-04	7.7030E-02	7.7030E-02	8.668E-02
TH-234	#B	4.0236E-01	4.0236E-01	1.0003E+00	1.0005E+00	1.111E+00
AM-241	#A	-1.2219E-02	-1.2219E-02	1.4934E-01	1.4934E-01	1.476E-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 2000.1 keV) 8.0999813E+00 pCi/gm
Total Decayed Activity (270.2 to 2000.1 keV) 8.0999832E+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: 107F_3AUG2006_0936.An1

Sample description
FSS-OOL-04-04-020-F

Spectrum Filename: C:\GammaVision\Spectra\107F_3AUG2006_0936.An1

Acquisition information

Start time:	03-Aug-2006 09:36:02
Live time:	2000
Real time:	2002
Dead time:	0.11 %
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:	1.2280E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.2280E+03) = 8.1433E+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	01-Aug-2006 15:30:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 22 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1940

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
62.35	138.	32.03	0.76	1.917E-02	59.54	36.300	PBC<MDA	AM241
74.48	316.	12.40	1.18	2.842E-02	74.81	9.600	1.257E+00	PB212
77.22	500.	8.60	1.18	2.970E-02	77.11	10.700	1.723E+00	PB214
					77.11	17.500	1.063E+00	PB212
87.16	154.	32.34	1.50	3.284E-02	86.45	32.740	PBC<MDA	EU155
92.47	235.	22.26	1.32	3.431E-02	88.04	3.790	2.050E+00	CD109
					92.38	2.570	2.830E+00	TH234
					92.80	3.000	2.292E+00	TH234
128.37	144.	28.41	1.63	3.816E-02				
186.12	198.	20.81	1.55	3.609E-02	185.99	3.280	1.844E+00	RA226
209.42	140.	22.76	1.71	3.427E-02				
238.77	1172.	3.56	1.30	3.188E-02	238.63	43.100	9.256E-01	PB212
241.54	208.	19.27	1.30	3.166E-02	241.00	3.900	1.832E+00	RA224
					241.92	7.470	9.623E-01	PB214
270.64	164.	19.43	1.78	2.941E-02				
295.49	264.	9.20	1.34	2.766E-02	295.22	19.200	5.375E-01	PB214
300.50	96.	20.67	1.34	2.733E-02				
338.79	333.	9.66	1.65	2.498E-02	338.40	12.010	1.207E+00	AC228
352.06	431.	7.91	1.35	2.425E-02	351.99	37.100	5.210E-01	PB214
410.05	39.	37.95	1.58	2.152E-02				
463.83	92.	26.07	1.28	1.952E-02	463.51	10.000	5.043E-01	SB125
511.26	182.	13.03	2.08	1.807E-02	510.72	22.500	4.010E-01	TL208
583.64	432.	6.16	1.53	1.628E-02	583.14	86.000	3.358E-01	TL208
609.64	356.	8.54	1.76	1.574E-02	609.32	46.090	5.335E-01	BI214
661.91	165.	13.32	1.71	1.477E-02	661.62	84.620	1.422E-01	CS137
727.45	150.	16.07	1.34	1.374E-02	727.17	11.800	1.008E+00	BI212
795.45	36.	38.41	1.68	1.284E-02	795.76	85.400	PBC<MDA	CS134

859.89	69.	21.16	1.77	1.212E-02				
911.64	310.	8.38	1.76	1.160E-02	911.07	29.000	9.982E-01	AC228
968.91	256.	10.90	1.53	1.109E-02	964.00	14.580	1.732E+00	EU152
					968.90	17.460	1.439E+00	AC228
1120.83	108.	18.37	2.14	9.966E-03	1120.28	15.040	7.898E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1461.41	1373.	2.80	2.09	8.188E-03	1460.75	10.700	1.718E+01	K40
1589.25	59.	13.96	0.80	7.683E-03				
1765.05	84.	11.79	2.02	7.084E-03	1764.51	15.920	8.168E-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	
124.38	62.35	759.	138.	0.069	96.09	0.755	PA-234	l
256.39	128.37	573.	178.	0.089	61.35	1.632	AC-228	s
418.48	209.42	384.	140.	0.070	68.28	1.705	AC-228	s
540.91	270.64	302.	164.	0.082	58.29	1.784	AC-228	s
600.48	300.43	166.	94.	0.047	65.87	1.066	PB-212	M
819.71	410.05	90.	39.	0.020	113.84	1.584	AC-228	
1719.35	859.89	46.	69.	0.034	63.49	1.774	TL-208	s
3178.12	1589.25	3.	59.	0.030	41.88	0.805	AC-228	s

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

This section based on library: 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	592.	335.	0.167	34.51	1.178D
PB-212	153.89	77.11	616.	433.	0.217	22.52	1.179A
EU-155	173.99	87.16	1156.	154.	0.077	97.01	1.500
TH-234	185.22	92.78	1096.	214.	0.107	66.05	1.500
TH-234	185.19	92.77	1053.	209.	0.104	62.86	1.500
RA-226	371.88	186.12	558.	198.	0.099	62.42	1.546s
TH-227	472.67	236.52	1158.	-127.	-0.064	116.55	1.500s
PB-212	476.89	238.63	249.	1150.	0.575	10.39	1.297D
RA-224	482.78	241.57	792.	136.	0.068	90.21	1.500
PB-214	483.47	241.92	416.	181.	0.090	52.34	1.299D
PB-214	590.46	295.42	241.	262.	0.131	32.06	1.556
AC-228	677.20	338.79	245.	329.	0.165	28.97	1.647s
PB-214	703.73	352.06	234.	426.	0.213	23.73	1.349
SB-125	926.51	463.46	116.	71.	0.036	70.10	1.500s
TL-208	1022.11	511.26	165.	148.	0.074	39.10	2.085s
TL-208	1166.86	583.64	100.	427.	0.214	18.47	1.531s
BI-214	1218.85	609.64	158.	352.	0.176	25.63	1.758
CS-137	1323.39	661.91	110.	161.	0.081	39.96	1.705

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	1454.47	727.45	111.	149.	0.074	48.21	1.342s
CS-134	1590.48	795.45	79.	36.	0.018	115.22	1.684
AC-228	1822.84	911.64	91.	305.	0.153	25.13	1.763
AC-228	1937.38	968.91	118.	253.	0.127	32.69	1.526
BI-214	2241.22	1120.83	83.	108.	0.054	55.11	2.142
K-40	2922.42	1461.41	24.	1368.	0.684	8.41	2.094
BI-214	3529.74	1765.05	4.	84.	0.042	35.38	2.018

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		1.0456E-01						
			477.56	1.046E-01	%(	2.989E-01	8.94E-02	G
K-40		1.7183E+01						
			1460.75	1.718E+01	(P	3.178E-01	4.83E-01	G
MN-54		-4.4369E-04						
			834.81	-4.437E-04	%(P	3.664E-02	1.04E-02	G
CO-57		6.5654E-03						
			122.07	6.565E-03	&(P	4.215E-02	1.26E-02	G K
			136.43	5.423E-02	% P	3.530E-01	1.06E-01	G
CO-60		-6.2341E-03						
			1332.51	-6.234E-03	%(P	4.156E-02	1.11E-02	G K
			1173.23	5.778E-03	% P	4.447E-02	1.26E-02	G K
Sr-85		-1.6729E-02						
			514.00	-1.673E-02	&(	4.803E-02	1.44E-02	G
Kr-85		-4.2183E+02						
			513.99	-4.218E+02	&(P	1.095E+03	3.27E+02	G
Y-88		-7.2151E-03						
			1836.01	-7.215E-03	%(P	3.279E-02	8.91E-03	G K
			898.02	2.677E-04	% P	3.653E-02	1.02E-02	G
NB-94		-1.2472E-04						
			871.10	-1.247E-04	&(P	4.276E-02	1.22E-02	G K
			702.50	-1.285E-02	% P	4.206E-02	1.25E-02	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-1.6538E-03						
		722.95	-1.654E-03	%(	4.653E-02	1.34E-02	G K
		614.37	-2.143E-02	%	4.635E-02	1.40E-02	G
		433.93	-1.635E-03	% P	3.722E-02	1.08E-02	G
CD-109	-3.5711E-01						
		88.04	-3.571E-01	%(P	1.360E+00	4.09E-01	G
SN-113	1.3712E-02						
		391.71	1.371E-02	%(P	5.130E-02	1.52E-02	G K
		255.04	1.243E-01	&	1.403E+00	4.14E-01	G
SB-125	1.2226E-01						
		427.95	2.765E-02	%(P	8.270E-02	2.46E-02	G K
		600.77	-1.364E-02	% P	1.903E-01	5.46E-02	G
		636.15	8.644E-02	% P	2.590E-01	7.68E-02	G
		463.51	4.023E-01	(P	2.981E-01	9.77E-02	G
		176.29	1.010E-01	& P	5.192E-01	1.55E-01	G
I-131	-7.1084E-03						
		364.48	-7.108E-03	&(	4.260E-02	1.26E-02	G K
		636.97	1.690E-01	%	4.331E-01	1.30E-01	G
		284.29	-1.716E-01	%	6.488E-01	1.94E-01	G
CS-134	1.7411E-02						
		604.66	1.200E-03	%(P	7.499E-02	2.22E-02	G K
		795.76	3.594E-02	(P	4.448E-02	1.40E-02	G
		569.29	-1.507E-02	&	2.022E-01	5.84E-02	G
		801.84	-9.015E-02	% P	4.403E-01	1.29E-01	G
CS-137	1.4217E-01						
		661.62	1.422E-01	(P	4.533E-02	1.94E-02	G
CE-139	7.1657E-05						
		165.85	7.166E-05	%(P	4.601E-02	1.37E-02	G
EU-152	2.3954E-02						
		121.78	2.395E-02	&(P	1.250E-01	3.74E-02	G K
		344.30	-4.393E-02	& P	1.341E-01	4.02E-02	G
		1408.08	7.203E-02	& P	1.540E-01	4.64E-02	G
		964.00	-1.126E-02	% P	3.846E-01	1.11E-01	G
		1112.07	9.756E-02	% P	3.311E-01	9.78E-02	G
		778.90	6.089E-02	% P	2.729E-01	7.99E-02	G
EU-154	5.2101E-04						
		123.10	5.210E-04	&(P	8.180E-02	2.42E-02	G K
		1274.80	7.329E-05	& P	1.127E-01	3.13E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          723.30-1.031E-01 & P 2.657E-01 7.98E-02 G
                         1004.80 8.879E-03 & P 2.602E-01 7.45E-02 G

EU-155       1.5729E-01
                           86.45 1.573E-01  (  1.651E-01 5.09E-02 G K
                          105.31 7.359E-02 % P 1.826E-01 5.52E-02 G

HG-203      -6.1414E-05
                          279.17-6.141E-05 %(P 4.312E-02 1.27E-02 G K
                           72.87-3.500E-01 % P 1.241E+00 3.74E-01 G
                           70.83-1.610E+00 &   2.254E+00 6.89E-01 G
                           82.50-5.253E-01 %   2.518E+00 7.57E-01 G

TL-208       3.3577E-01
                          583.14 3.358E-01 *(P 3.865E-02 2.09E-02 G
                          510.72 4.010E-01 + P 1.691E-01 6.42E-02 G

PB-212       9.2080E-01
                          238.63 9.208E-01  (P 6.101E-02 3.23E-02 G K
                                                          Energy duplication
                           77.11 9.208E-01 }   2.518E-01 6.91E-02 G
                           74.81 1.346E+00 + P 4.672E-01 1.57E-01 G

PB-214       5.2827E-01
                          351.99 5.210E-01  (P 9.046E-02 4.17E-02 G K
                          295.22 5.423E-01  (P 1.555E-01 5.90E-02 G
                                                          Energy duplication
                           77.11 2.269E-01 } P 5.213E-01 1.62E-01 G
                          241.92 8.423E-01 + P 4.554E-01 1.48E-01 G

BI-212       1.0078E+00
                          727.17 1.008E+00 *(P 3.523E-01 1.63E-01 G K
                         1620.56-2.655E-02 % P 8.537E-01 2.09E-01 G
                          785.42-4.728E-01 % P 2.111E+00 6.17E-01 G

BI-214       5.3354E-01
                          609.32 5.335E-01  (P 9.302E-02 4.62E-02 G K
                         1764.51 8.168E-01 + P 1.207E-01 9.74E-02 G
                         1120.28 7.898E-01 + P 3.322E-01 1.46E-01 G

RA-224       1.2064E+00
                          241.00 1.206E+00 ?(P 1.191E+00 3.69E-01 G

RA-226       1.8438E+00
                          185.99 1.844E+00  (  1.048E+00 3.84E-01 G

AC-228       1.0595E+00
                          911.07 9.982E-01  (P 1.539E-01 8.48E-02 G K
                          968.90 1.439E+00 + P 3.027E-01 1.58E-01 G
                          338.40 1.207E+00 *(P 2.770E-01 1.18E-01 G
```

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

TH-227      -3.9014E-01
                          236.00-3.901E-01 ?(P 4.935E-01 1.51E-01 G K
                          256.25 2.309E-02 & P 4.705E-01 1.39E-01 G

PA-234       4.0736E-02
                           98.44 4.074E-02 %(  1.640E-01 4.93E-02 G K
                          946.00-4.532E-02 %   2.035E-01 5.96E-02 G
                          131.28-6.685E-02 %   2.051E-01 6.19E-02 G
                           94.67-1.660E-01 %   3.270E-01 9.93E-02 G
                          883.24 8.971E-02 %   2.880E-01 8.52E-02 G
                          926.70 1.190E-02 &   2.742E-01 7.67E-02 G
                          569.26-2.100E-02 &   2.993E-01 8.64E-02 G

TH-234       1.7376E+00
                           63.29 7.399E-01 %(P 2.199E+00 6.62E-01 G K
                           92.80 2.229E+00  (P 1.642E+00 5.11E-01 G
                           92.38 2.678E+00  (P 1.960E+00 6.12E-01 G

AM-241       7.3398E-02
                           59.54 7.340E-02 %(P 2.645E-01 7.96E-02 G
   ( - This peak used in the nuclide activity average.

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

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

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

- -

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

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.0220E-01	1.0456E-01	2.6824E-01	2.6831E-01	2.922E-01
K-40		1.7183E+01	1.7183E+01	1.4493E+00	1.7693E+00	
MN-54	#A	-4.4197E-04	-4.4369E-04	4.2018E-01	4.2018E-01	3.650E-02
CO-57	#B	6.5359E-03	6.5654E-03	3.7802E-02	3.7804E-02	4.197E-02
CO-60	#B	-6.2302E-03	-6.2341E-03	2.4236E-01	2.4236E-01	4.153E-02
Sr-85	#A	-1.6418E-02	-1.6729E-02	4.3288E-02	4.3300E-02	4.714E-02
Kr-85	#A	-4.2182E+02	-4.2183E+02	1.2010E+03	1.2012E+03	1.095E+03
Y-88	#B	-7.1332E-03	-7.2151E-03	3.8788E-02	3.8790E-02	3.242E-02
NB-94	#B	-1.2472E-04	-1.2472E-04	9.9673E-03	9.9673E-03	4.276E-02
Ag-108M	#B	-1.6537E-03	-1.6538E-03	4.0349E-02	4.0349E-02	4.653E-02
CD-109	#A	-3.5615E-01	-3.5711E-01	1.2475E+00	1.2477E+00	1.357E+00
SN-113	#B	1.3568E-02	1.3712E-02	4.5738E-02	4.5745E-02	5.076E-02
SB-125	#F	1.2212E-01	1.2226E-01	8.9084E-02	8.9376E-02	8.260E-02
I-131	#B	-6.1108E-03	-7.1084E-03	3.7711E-02	3.7713E-02	3.662E-02
CS-134	#B	1.7382E-02	1.7411E-02	2.0357E-02	2.0383E-02	7.487E-02
CS-137		1.4216E-01	1.4217E-01	5.8053E-02	5.8657E-02	
CE-139	#A	7.1026E-05	7.1657E-05	4.0972E-02	4.0972E-02	4.561E-02
EU-152	#B	2.3947E-02	2.3954E-02	1.1229E-01	1.1230E-01	1.250E-01
EU-154	#B	5.2081E-04	5.2101E-04	7.2709E-02	7.2709E-02	8.177E-02
EU-155	#A	1.5718E-01	1.5729E-01	1.5259E-01	1.5283E-01	1.650E-01
HG-203	#B	-5.9832E-05	-6.1414E-05	4.6347E-02	4.6347E-02	4.201E-02
TL-208	#	3.3577E-01	3.3577E-01	6.2681E-02	6.5743E-02	
PB-212		9.2080E-01	9.2080E-01	9.7019E-02	1.1122E-01	
PB-214		5.2827E-01	5.2827E-01	1.0698E-01	1.1144E-01	
BI-212	#	1.0078E+00	1.0078E+00	4.9011E-01	4.9371E-01	
BI-214		5.3354E-01	5.3354E-01	1.3843E-01	1.4197E-01	
RA-224	#	1.2064E+00	1.2064E+00	1.1062E+00	1.1085E+00	1.191E+00
RA-226	#	1.8438E+00	1.8438E+00	1.1508E+00	1.1560E+00	
AC-228		1.0595E+00	1.0595E+00	2.0552E-01	2.1483E-01	
TH-227	#A	-3.9014E-01	-3.9014E-01	4.5566E-01	4.5625E-01	4.935E-01
PA-234	#B	4.0736E-02	4.0736E-02	1.4778E-01	1.4780E-01	1.640E-01
TH-234	#B	1.7376E+00	1.7376E+00	1.1905E+00	1.1943E+00	2.199E+00
AM-241	#A	7.3397E-02	7.3398E-02	2.3869E-01	2.3872E-01	2.645E-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 2000.1 keV) 2.3554153E+01 pCi/gm
Total Decayed Activity (270.2 to 2000.1 keV) 2.3554173E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_3AUG2006_1018.An1

Sample description
FSS-OOL-04-04-018-F

Spectrum Filename: C:\GammaVision\Spectra\107F_3AUG2006_1018.An1

Acquisition information

Start time:	03-Aug-2006 10:18:35
Live time:	2000
Real time:	2002
Dead time:	0.10 %
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:	1.3920E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.3920E+03) = 7.1839E+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	01-Aug-2006 15:25:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2587

***** 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
75.04	274.	19.68	1.50	2.849E-02	74.81	9.600	9.722E-01	PB212
77.03	379.	13.88	1.50	2.957E-02	77.11	10.700	1.162E+00	PB214
					77.11	17.500	7.106E-01	PB212
77.03	384.	13.88	1.50	2.957E-02	77.11	10.700	1.162E+00	PB214
					77.11	17.500	7.195E-01	PB212
93.31	110.	39.47	1.23	3.449E-02	92.80	3.000	PBC<MDA	TH234
128.44	147.	33.43	0.69	3.816E-02				
186.21	189.	20.90	1.40	3.609E-02	185.99	3.280	1.553E+00	RA226
209.47	160.	27.12	1.80	3.427E-02				
238.87	1035.	3.83	1.30	3.188E-02	238.63	43.100	7.200E-01	PB212
242.22	169.	15.03	1.30	3.161E-02	241.00	3.900	1.313E+00	RA224
					241.92	7.470	6.903E-01	PB214
270.21	164.	18.49	2.13	2.945E-02				
295.46	212.	10.51	1.34	2.767E-02	295.22	19.200	3.783E-01	PB214
300.73	81.	22.98	1.34	2.732E-02				
328.17	62.	30.84	1.30	2.559E-02				
338.40	280.	15.17	1.62	2.500E-02	338.40	12.010	8.948E-01	AC228
352.15	444.	8.15	1.61	2.425E-02	351.99	37.100	4.732E-01	PB214
463.39	79.	26.30	1.22	1.953E-02				
463.39	79.	26.30	1.22	1.953E-02	463.51	10.000	3.792E-01	SB125
511.12	170.	16.41	1.47	1.807E-02	510.72	22.500	3.254E-01	TL208
583.59	386.	6.77	1.56	1.628E-02	583.14	86.000	2.641E-01	TL208
609.65	329.	8.16	1.52	1.574E-02	609.32	46.090	4.341E-01	BI214
661.98	276.	10.32	1.33	1.477E-02	661.62	84.620	2.115E-01	CS137
727.43	121.	20.06	1.14	1.374E-02	727.17	11.800	7.167E-01	BI212
795.31	60.	32.76	1.17	1.284E-02				
795.31	60.	32.76	1.17	1.284E-02	795.76	85.400	5.274E-02	CS134

860.95	74.	24.17	1.97	1.211E-02				
911.62	301.	8.57	1.24	1.160E-02	911.07	29.000	8.553E-01	AC228
968.54	229.	9.40	1.89	1.110E-02	968.90	17.460	1.137E+00	AC228
1120.46	102.	19.90	1.19	9.969E-03	1120.28	15.040	6.534E-01	BI214
1461.45	1275.	2.85	1.97	8.188E-03	1460.75	10.700	1.407E+01	K40
1765.41	73.	12.63	1.91	7.081E-03	1764.51	15.920	6.207E-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	
256.54	128.44	790.	144.	0.072	86.43	0.692	AC-228	s
418.59	209.47	559.	160.	0.080	81.36	1.796	AC-228	s
477.37	238.83	269.	1035.	0.518	11.49	1.297	PB-212	D
484.08	242.18	240.	169.	0.085	45.09	1.300	PB-214	D
540.05	270.21	270.	164.	0.082	55.48	2.132	AC-228	s
600.76	300.57	199.	97.	0.049	73.97	1.627	PB-212	s
655.96	328.17	144.	62.	0.031	92.53	1.304	AC-228	
1721.47	860.95	67.	75.	0.037	58.03	1.971	TL-208	s

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

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.76	75.04	1359.	274.	0.137	59.03	1.500s
PB-214	153.89	77.11	1230.	379.	0.189	41.64	1.500D
PB-212	153.89	77.11	1225.	384.	0.192	41.64	1.500D
TH-234	185.55	92.94	1125.	130.	0.065	97.57	1.500
RA-226	372.06	186.21	530.	189.	0.095	62.69	1.400s
TH-227	472.22	236.29	1069.	-124.	-0.062	115.47	1.500s
PB-212	477.35	238.86	587.	978.	0.489	13.95	1.500s
RA-224	483.19	241.78	750.	107.	0.054	109.99	1.500
PB-214	590.66	295.52	298.	205.	0.102	40.46	1.500s
AC-228	676.41	338.40	375.	277.	0.138	45.52	1.616s
PB-214	703.91	352.15	202.	425.	0.213	20.01	1.500
SB-125	926.07	463.24	122.	74.	0.037	69.39	1.500
TL-208	1021.84	511.12	203.	136.	0.068	49.23	1.466
TL-208	1166.76	583.59	97.	381.	0.191	20.31	1.556s
BI-214	1218.88	609.65	120.	324.	0.162	24.49	1.518
CS-137	1323.53	661.98	134.	272.	0.136	30.95	1.326
BI-212	1454.44	727.43	118.	120.	0.060	60.17	1.138s
CS-134	1590.60	795.52	75.	43.	0.022	95.07	1.684s
AC-228	1822.80	911.62	83.	297.	0.148	25.72	1.244
AC-228	1936.64	968.54	67.	227.	0.113	28.19	1.891
BI-214	2240.49	1120.46	82.	101.	0.050	59.70	1.193s
K-40	2922.50	1461.45	15.	1270.	0.635	8.55	1.966

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3530.66	1765.50	10.	45.	0.023	52.47	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	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-8.8938E-04					
			477.56	-8.894E-04	%(	2.830E-01 8.18E-02	G
K-40		1.4068E+01					
			1460.75	1.407E+01	(P	2.295E-01 4.03E-01	G
MN-54		-6.0691E-03					
			834.81	-6.069E-03	%(P	3.282E-02 9.52E-03	G
CO-57		-1.0875E-04					
			122.07	-1.087E-04	&(P	3.640E-02 1.08E-02	G K
			136.43	6.333E-03	% P	2.355E-01 6.96E-02	G
CO-60		7.4651E-03					
			1332.51	7.465E-03	%(P	3.928E-02 1.12E-02	G K
			1173.23	-1.108E-02	% P	4.994E-02 1.43E-02	G K
Sr-85		-1.0094E-02					
			514.00	-1.009E-02	%(	3.562E-02 1.06E-02	G
Kr-85		-2.6616E+02					
			513.99	-2.662E+02	%(P	8.134E+02 2.41E+02	G
Y-88		-1.1483E-03					
			1836.01	-1.148E-03	%(P	2.868E-02 7.29E-03	G K
			898.02	5.157E-03	% P	2.837E-02 8.09E-03	G
NB-94		-4.1154E-03					
			871.10	-4.115E-03	%(P	2.820E-02 8.08E-03	G K
			702.50	4.247E-04	& P	3.531E-02 1.02E-02	G K
Ag-108M		-9.0154E-03					
			722.95	-9.015E-03	%(	4.583E-02 1.35E-02	G K
			614.37	-2.571E-02	%	4.290E-02 1.31E-02	G
			433.93	6.784E-03	% P	2.945E-02 8.69E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	-1.1754E-01						
		88.04	-1.175E-01	%(P	1.370E+00	4.10E-01	G
SN-113	-1.2702E-02						
		391.71	-1.270E-02	&(P	4.971E-02	1.47E-02	G K
		255.04	8.368E-02	&	1.265E+00	3.73E-01	G
SB-125	8.6959E-02						
		427.95	-8.220E-03	&(P	1.023E-01	2.98E-02	G K
		600.77	-3.460E-02	% P	1.734E-01	5.06E-02	G
		636.15	-4.382E-02	% P	2.671E-01	7.76E-02	G
		463.51	3.687E-01	(P	2.702E-01	8.85E-02	G
		176.29	-2.012E-02	% P	4.919E-01	1.46E-01	G
I-131	1.0507E-02						
		364.48	1.051E-02	&(	2.959E-02	8.85E-03	G K
		636.97	0.000E+00	&	5.099E-01	1.46E-01	G
		284.29	1.029E-01	%	5.392E-01	1.60E-01	G
CS-134	1.7706E-02						
		604.66	-3.296E-04	%(P	6.209E-02	1.83E-02	G K
		795.76	3.832E-02	@(P	3.812E-02	1.23E-02	G
		569.29	5.500E-03	&	1.616E-01	4.62E-02	G
		801.84	-5.795E-02	& P	4.012E-01	1.16E-01	G
CS-137	2.1149E-01						
		661.62	2.115E-01	(P	4.396E-02	2.21E-02	G
CE-139	-8.3080E-03						
		165.85	-8.308E-03	%(P	4.026E-02	1.21E-02	G
EU-152	1.7681E-03						
		121.78	1.768E-03	&(P	1.156E-01	3.44E-02	G K
		344.30	4.959E-03	% P	1.047E-01	3.07E-02	G
		1408.08	4.971E-02	% P	1.295E-01	3.82E-02	G
		964.00	-4.473E-03	% P	3.579E-01	1.04E-01	G
		1112.07	-3.246E-02	% P	3.071E-01	8.82E-02	G
		778.90	-2.993E-02	% P	2.628E-01	7.58E-02	G
EU-154	-1.6517E-02						
		123.10	-1.652E-02	&(P	8.570E-02	2.57E-02	G K
		1274.80	3.064E-02	& P	1.000E-01	2.94E-02	G
		723.30	-6.408E-02	% P	2.195E-01	6.53E-02	G
		1004.80	-3.235E-02	% P	2.117E-01	6.13E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.0113E-01						
		86.45	1.011E-01	%(	1.494E-01	4.56E-02	G K
		105.31	5.070E-02	% P	1.689E-01	5.08E-02	G
HG-203	-1.4982E-03						
		279.17	-1.498E-03	&(P	3.619E-02	1.06E-02	G K
		72.87	-4.462E-01	& P	1.138E+00	3.44E-01	G
		70.83	6.105E-01	%	1.659E+00	5.01E-01	G
		82.50	-9.326E-01	%	2.250E+00	6.81E-01	G
TL-208	2.6406E-01						
		583.14	2.641E-01	(P	3.367E-02	1.81E-02	G
		510.72	3.254E-01	+ P	1.648E-01	6.66E-02	G
PB-212	6.9921E-01						
		238.63	6.910E-01	@(P	8.166E-02	3.26E-02	G K
							Energy duplication
		77.11	7.195E-01	*(	3.110E-01	9.99E-02	G
		74.81	9.722E-01	+ P	6.193E-01	1.94E-01	G
PB-214	4.5889E-01						
		351.99	4.589E-01	(P	7.438E-02	3.10E-02	G K
		295.22	3.742E-01	- P	1.520E-01	5.16E-02	G
							Energy duplication
		77.11	1.162E+00	+ P	5.097E-01	1.63E-01	G
		241.92	2.406E-01	% P	5.693E-01	1.72E-01	G
BI-212	7.1666E-01						
		727.17	7.167E-01	*(P	3.196E-01	1.45E-01	G K
		1620.56	2.155E-01	& P	9.342E-01	2.63E-01	G
		785.42	-4.732E-02	% P	1.759E+00	4.99E-01	G
BI-214	4.2282E-01						
		609.32	4.341E-01	(P	7.180E-02	3.59E-02	G K
		1764.51	3.900E-01	?(P	1.530E-01	6.96E-02	G
		1120.28	6.534E-01	+ P	2.909E-01	1.31E-01	G
RA-224	8.4017E-01						
		241.00	8.402E-01	?(P	1.023E+00	3.14E-01	G
RA-226	1.5528E+00						
		185.99	1.553E+00	@(	9.014E-01	3.25E-01	G
AC-228	8.6684E-01						
		911.07	8.553E-01	(P	1.306E-01	7.44E-02	G K
		968.90	1.137E+00	+ P	2.051E-01	1.08E-01	G
		338.40	8.948E-01	@(P	3.006E-01	1.37E-01	G

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

TH-227      -3.3422E-01
                          236.00-3.342E-01 ?(P 4.186E-01 1.28E-01 G K
                          256.25-1.262E-01 % P 4.295E-01 1.28E-01 G

PA-234      -2.3589E-02
                           98.44-2.359E-02 &(  1.541E-01 4.62E-02 G K
                          946.00 3.441E-04 &   1.597E-01 4.49E-02 G
                          131.28 1.392E-02 %   1.697E-01 5.06E-02 G
                           94.67 3.566E-03 %   2.821E-01 8.42E-02 G
                          883.24 6.448E-02 %   2.038E-01 6.00E-02 G
                          926.70 1.313E-02 &   2.551E-01 7.18E-02 G
                          569.26 1.218E-02 &   2.388E-01 6.84E-02 G

TH-234       8.0351E-01
                           63.29 4.833E-01 %(P 1.866E+00 5.59E-01 G K
                           92.80 1.220E+00  (P 1.496E+00 4.57E-01 G
                           92.38-1.119E-01 % P 1.545E+00 4.58E-01 G

AM-241       4.0664E-02
                           59.54 4.066E-02 %(P 2.291E-01 6.86E-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	-8.6898E-04	-8.8938E-04	2.4530E-01	2.4530E-01	2.766E-01
K-40		1.4068E+01	1.4068E+01	1.2072E+00	1.4655E+00	
MN-54	#A	-6.0450E-03	-6.0691E-03	3.1934E-02	3.1936E-02	3.269E-02
CO-57	#B	-1.0825E-04	-1.0875E-04	2.3947E-01	2.3947E-01	3.623E-02
CO-60	#B	7.4603E-03	7.4651E-03	3.3523E-02	3.3526E-02	3.925E-02
Sr-85	#A	-9.9032E-03	-1.0094E-02	3.1865E-02	3.1871E-02	3.495E-02
Kr-85	#A	-2.6615E+02	-2.6616E+02	9.5877E+02	9.5890E+02	8.134E+02
Y-88	#B	-1.1350E-03	-1.1483E-03	2.2052E+00	2.2052E+00	2.835E-02
NB-94	#B	-4.1154E-03	-4.1154E-03	2.5581E-02	2.5583E-02	2.820E-02
Ag-108M	#B	-9.0151E-03	-9.0154E-03	4.0590E-02	4.0593E-02	4.583E-02
CD-109	#A	-1.1722E-01	-1.1754E-01	1.2843E+00	1.2844E+00	1.366E+00
SN-113	#B	-1.2566E-02	-1.2702E-02	5.3780E-02	5.3785E-02	4.918E-02
SB-125	#B	8.6852E-02	8.6959E-02	6.2629E-02	6.2840E-02	1.022E-01
I-131	#B	9.0065E-03	1.0507E-02	2.6554E-02	2.6561E-02	2.536E-02
CS-134	#B	1.7677E-02	1.7706E-02	1.7039E-02	1.7071E-02	6.199E-02
CS-137		2.1146E-01	2.1149E-01	6.6306E-02	6.7472E-02	
CE-139	#A	-8.2335E-03	-8.3080E-03	3.7163E-02	3.7167E-02	3.990E-02
EU-152	#B	1.7677E-03	1.7681E-03	1.0319E-01	1.0319E-01	1.156E-01
EU-154	#B	-1.6510E-02	-1.6517E-02	8.0290E-02	8.0295E-02	8.566E-02
EU-155	#B	1.0106E-01	1.0113E-01	1.3681E-01	1.3692E-01	1.493E-01
HG-203	#B	-1.4589E-03	-1.4982E-03	6.8900E-02	6.8900E-02	3.524E-02
TL-208		2.6406E-01	2.6406E-01	5.4262E-02	5.6459E-02	
PB-212	#	6.9921E-01	6.9921E-01	9.9106E-02	1.0737E-01	8.166E-02
PB-214	#	4.5889E-01	4.5889E-01	9.2919E-02	9.6791E-02	7.438E-02
BI-212	#	7.1666E-01	7.1666E-01	4.3587E-01	4.3792E-01	
BI-214		4.2282E-01	4.2282E-01	1.0493E-01	1.0786E-01	
RA-224	#A	8.4017E-01	8.4017E-01	9.4341E-01	9.4471E-01	1.023E+00
RA-226	#	1.5528E+00	1.5528E+00	9.7341E-01	9.7772E-01	
AC-228		8.6684E-01	8.6684E-01	2.2615E-01	2.3187E-01	
TH-227	#A	-3.3422E-01	-3.3422E-01	3.8680E-01	3.8730E-01	4.186E-01
PA-234	#B	-2.3589E-02	-2.3589E-02	1.3848E-01	1.3849E-01	1.541E-01
TH-234	#B	8.0351E-01	8.0351E-01	9.0333E-01	9.0443E-01	1.866E+00
AM-241	#A	4.0663E-02	4.0664E-02	2.0594E-01	2.0595E-01	2.291E-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 2000.1 keV) 1.8102816E+01 pCi/gm
Total Decayed Activity (270.2 to 2000.1 keV) 1.8102842E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_3AUG2006_1103.An1

Sample description
FSS-OOL-04-04-017-F

Spectrum Filename: C:\GammaVision\Spectra\107F_3AUG2006_1103.An1

Acquisition information
Start time: 03-Aug-2006 11:03:07
Live time: 2000
Real time: 2002
Dead time: 0.10 %
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: 1.4540E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4540E+03) =
6.8776E+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	01-Aug-2006 15:10:00
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. 22 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.3092

***** 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
74.79	329.	12.13	1.18	2.849E-02	74.81	9.600	1.119E+00	PB212
77.09	363.	9.81	1.18	2.957E-02	77.11	17.500	9.510E-01	PB212
					77.11	10.700	1.541E+00	PB214
77.14	159.	30.03	1.50	2.957E-02	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	PBC<MDA	PB214
87.34	246.	15.16	1.19	3.310E-02	86.45	32.740	2.131E-01	EU155
					88.04	3.790	1.818E+00	CD109
89.44	97.	37.34	1.19	3.363E-02				
89.44	97.	37.34	1.19	3.363E-02	92.38	2.570	PBC<MDA	TH234
93.16	215.	16.09	1.19	3.447E-02	92.80	3.000	1.762E+00	TH234
128.58	135.	38.28	0.94	3.817E-02				
186.06	236.	17.11	1.24	3.610E-02	185.99	3.280	1.849E+00	RA226
209.78	134.	25.92	1.81	3.425E-02				
238.84	1137.	3.69	1.30	3.188E-02	238.63	43.100	7.579E-01	PB212
241.64	201.	20.91	1.30	3.166E-02	241.00	3.900	1.493E+00	RA224
					241.92	7.470	7.845E-01	PB214
270.54	122.	21.84	1.72	2.942E-02				
295.29	292.	9.71	1.42	2.767E-02	295.22	19.200	5.035E-01	PB214
328.19	61.	30.80	1.57	2.559E-02				
338.51	309.	11.55	1.53	2.500E-02	338.40	12.010	9.461E-01	AC228
352.17	543.	6.93	1.61	2.425E-02	351.99	37.100	5.557E-01	PB214
463.23	79.	29.33	1.41	1.954E-02				
463.23	79.	29.33	1.41	1.954E-02	463.51	10.000	3.650E-01	SB125
511.21	195.	12.63	1.61	1.807E-02	510.72	22.500	3.679E-01	TL208
583.58	424.	6.81	1.83	1.628E-02	583.14	86.000	2.781E-01	TL208
609.61	386.	7.62	1.63	1.574E-02	609.32	46.090	4.894E-01	BI214
662.04	242.	14.19	1.62	1.476E-02	661.62	84.620	1.775E-01	CS137

728.56	97.	19.29	1.94	1.372E-02	727.17	11.800	5.491E-01	BI212
796.05	45.	28.09	1.06	1.284E-02	795.76	85.400	3.801E-02	CS134
861.92	85.	22.69	1.39	1.210E-02				
911.64	342.	7.58	1.90	1.160E-02	911.07	29.000	9.323E-01	AC228
964.25	41.	31.98	1.80	1.113E-02				
969.43	160.	9.89	1.80	1.109E-02	968.90	17.460	7.565E-01	AC228
1120.89	100.	16.51	0.89	9.966E-03	1120.28	15.040	6.168E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1461.48	1452.	2.70	2.34	8.188E-03	1460.75	10.700	1.535E+01	K40
1621.43	21.	31.21	0.95	7.569E-03	1620.56	2.750	9.510E-01	BI212
1765.61	91.	11.40	2.47	7.084E-03	1764.51	15.920	7.525E-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	
178.54	89.51	611.	97.	0.049	112.02	1.188	PB-214	lD
256.82	128.58	849.	162.	0.081	79.77	0.938	AC-228	s
419.19	209.78	429.	134.	0.067	77.76	1.808	NP-239	s
540.71	270.54	245.	122.	0.061	65.52	1.716	AC-228	s
656.01	328.19	146.	61.	0.031	92.40	1.570	AC-228	
1723.40	861.92	79.	87.	0.043	54.02	1.390	TL-208	s
1929.35	964.39	50.	57.	0.028	66.00	1.796	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
HG-203	146.26	73.30	1404.	-131.	-0.065	124.44	1.500s
PB-212	149.29	74.81	654.	329.	0.165	36.39	1.178D
PB-212	153.89	77.11	695.	363.	0.182	29.44	1.179A
PB-214	153.89	77.11	1121.	159.	0.080	90.08	1.500A
EU-155	174.19	87.26	1276.	203.	0.102	77.40	1.500
CD-109	174.15	87.24	1181.	200.	0.100	75.90	1.500
TH-234	185.92	93.13	1194.	180.	0.090	75.89	1.500s
RA-226	371.75	186.06	534.	236.	0.118	51.33	1.236s
TH-227	471.74	236.05	997.	-117.	-0.059	117.91	1.500s
PB-212	476.89	238.63	273.	1121.	0.561	10.72	1.297D
RA-224	483.17	241.77	877.	123.	0.062	103.59	1.500
PB-214	483.47	241.92	495.	183.	0.091	55.72	1.299D
PB-214	590.20	295.29	228.	288.	0.144	29.14	1.418s
AC-228	676.63	338.51	295.	306.	0.153	34.65	1.532s
PB-214	703.96	352.17	262.	538.	0.269	20.78	1.606s
SB-125	926.33	463.36	139.	66.	0.033	80.67	1.500
TL-208	1022.00	511.21	166.	161.	0.081	37.89	1.608s
TL-208	1166.75	583.58	129.	419.	0.210	20.44	1.827s
BI-214	1218.80	609.61	134.	382.	0.191	22.85	1.634

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CS-137	1323.66	662.04	203.	239.	0.119	42.57	1.624s
BI-212	1456.69	728.56	83.	96.	0.048	57.88	1.943s
CS-134	1591.39	795.91	67.	47.	0.023	85.05	1.684s
AC-228	1822.85	911.64	93.	338.	0.169	22.74	1.902
AC-228	1937.36	968.90	62.	158.	0.079	31.36	1.799D
BI-214	2241.36	1120.89	65.	100.	0.050	49.53	0.885s
K-40	2922.56	1461.48	26.	1448.	0.724	8.11	2.336
BI-212	3242.48	1621.43	8.	21.	0.011	93.62	0.949s
BI-214	3530.87	1765.61	5.	91.	0.046	34.19	2.466

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		2.6388E-03					
			477.56	2.639E-03	&(	2.846E-01 8.25E-02	G
K-40		1.5351E+01					
			1460.75	1.535E+01	(P	2.828E-01 4.16E-01	G
MN-54		-1.2096E-05					
			834.81	-1.210E-05	&(P	2.904E-02 8.18E-03	G
CO-57		3.8594E-04					
			122.07	3.859E-04	%(P	3.840E-02 1.14E-02	G K
			136.43	-4.251E-02	% P	3.247E-01 9.72E-02	G
CO-60		-2.7789E-04					
			1332.51	-2.779E-04	&(P	4.000E-02 1.11E-02	G K
			1173.23	-1.111E-02	% P	4.790E-02 1.37E-02	G K
Sr-85		-1.9775E-02					
			514.00	-1.978E-02	%(	4.093E-02 1.24E-02	G
Kr-85		-4.8364E+02					
			513.99	-4.836E+02	%(P	9.318E+02 2.81E+02	G
Y-88		3.8470E-03					
			1836.01	3.847E-03	&(P	2.226E-02 5.95E-03	G K
			898.02	9.937E-03	% P	2.992E-02 8.81E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	-5.0074E-03						
		871.10	-5.007E-03	%(P	3.489E-02	1.01E-02	G K
		702.50	1.232E-02	% P	2.722E-02	8.21E-03	G K
Ag-108M	1.4844E-02						
		722.95	1.484E-02	&(	3.329E-02	1.01E-02	G K
		614.37	-2.914E-02	%	4.369E-02	1.35E-02	G
		433.93	-4.958E-04	% P	3.158E-02	9.14E-03	G
CD-109	1.4766E+00						
		88.04	1.477E+00	(P	1.204E+00	3.74E-01	G
SN-113	-5.9580E-04						
		391.71	-5.958E-04	&(P	3.980E-02	1.15E-02	G K
		255.04	3.307E-01	%	1.405E+00	4.20E-01	G
SB-125	7.7547E-02						
		427.95	-2.144E-03	%(P	9.493E-02	2.75E-02	G K
		600.77	3.638E-02	& P	1.515E-01	4.45E-02	G
		636.15	1.143E-01	% P	2.092E-01	6.39E-02	G
		463.51	3.134E-01	(P	2.743E-01	8.79E-02	G
		176.29	1.202E-01	% P	4.857E-01	1.46E-01	G
I-131	-1.2139E-02						
		364.48	-1.214E-02	%(	4.069E-02	1.22E-02	G K
		636.97	-1.694E-01	&	5.163E-01	1.54E-01	G
		284.29	9.197E-02	%	5.072E-01	1.51E-01	G
CS-134	1.9871E-02						
		604.66	2.363E-03	%(P	2.470E-02	7.09E-03	G K
		795.76	3.988E-02	(P	3.479E-02	1.14E-02	G
		569.29	-1.751E-03	%	2.056E-01	5.95E-02	G
		801.84	2.419E-02	& P	3.467E-01	9.93E-02	G
CS-137	1.7748E-01						
		661.62	1.775E-01	@(P	5.143E-02	2.56E-02	G
CE-139	-1.4797E-04						
		165.85	-1.480E-04	&(P	4.057E-02	1.21E-02	G
EU-152	-1.9016E-03						
		121.78	-1.902E-03	%(P	1.183E-01	3.52E-02	G K
		344.30	-1.931E-02	& P	1.054E-01	3.12E-02	G
		1408.08	9.615E-03	& P	1.597E-01	4.45E-02	G
		964.00	5.706E-02	& P	2.049E-01	6.02E-02	G
		1112.07	3.672E-02	% P	3.143E-01	9.10E-02	G
		778.90	-4.768E-02	% P	2.323E-01	6.76E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-154	-1.3398E-02						
		123.10	-1.340E-02	%(P	8.500E-02	2.54E-02	G K
		1274.80	2.050E-02	& P	8.981E-02	2.60E-02	G
		723.30	2.456E-03	& P	2.879E-01	8.46E-02	G
		1004.80	4.286E-02	& P	1.979E-01	5.78E-02	G
EU-155	1.7599E-01						
		86.45	1.760E-01	(	1.463E-01	4.54E-02	G K
		105.31	2.441E-02	% P	1.614E-01	4.83E-02	G
HG-203	-3.0676E-03						
		279.17	-3.068E-03	&(P	3.225E-02	9.48E-03	G K
		72.87	-3.287E-01	% P	1.150E+00	3.47E-01	G
		70.83	-1.351E+00	&	1.833E+00	5.60E-01	G
		82.50	-7.762E-01	%	2.166E+00	6.54E-01	G
TL-208	2.7814E-01						
		583.14	2.781E-01	@(P	3.688E-02	1.92E-02	G
		510.72	3.679E-01	+ P	1.433E-01	5.62E-02	G
PB-212	7.5801E-01						
		238.63	7.580E-01	(P	5.387E-02	2.75E-02	G K
							Energy duplication
		77.11	6.523E-01	}	2.256E-01	6.40E-02	G
		74.81	1.119E+00	+ P	4.140E-01	1.37E-01	G
PB-214	5.3788E-01						
		351.99	5.557E-01	@(P	8.068E-02	3.89E-02	G K
		295.22	5.035E-01	*(P	1.278E-01	4.97E-02	G
							Energy duplication
		77.11	4.682E-01	} P	4.662E-01	1.41E-01	G
		241.92	7.193E-01	+ P	4.185E-01	1.35E-01	G
BI-212	5.4912E-01						
		727.17	5.491E-01	@(P	2.591E-01	1.07E-01	G K
		1620.56	9.510E-01	+ P	6.985E-01	3.04E-01	G
		785.42	7.127E-01	% P	1.614E+00	4.86E-01	G
BI-214	4.8942E-01						
		609.32	4.894E-01	(P	7.255E-02	3.77E-02	G K
		1764.51	7.525E-01	+ P	1.056E-01	8.67E-02	G
		1120.28	6.168E-01	+ P	2.505E-01	1.03E-01	G
RA-224	9.2569E-01						
		241.00	9.257E-01	&(P	1.058E+00	3.25E-01	G
RA-226	1.8492E+00						
		185.99	1.849E+00	*(	8.668E-01	3.16E-01	G

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

AC-228       9.3631E-01
                          911.07 9.323E-01  (P 1.318E-01 7.16E-02 G K
                          968.90 7.573E-01 - P 1.894E-01 8.03E-02 G
                          338.40 9.461E-01 *(P 2.562E-01 1.10E-01 G

TH-227      -3.0281E-01
                          236.00-3.028E-01 ?(P 3.873E-01 1.19E-01 G K
                          256.25 5.362E-02 & P 4.355E-01 1.29E-01 G

PA-234      -6.3587E-03
                           98.44-6.359E-03 %(  1.496E-01 4.46E-02 G K
                          946.00 0.000E+00 &   2.248E-01 6.48E-02 G
                          131.28-2.983E-02 %   1.744E-01 5.23E-02 G
                           94.67-1.228E-01 %   2.933E-01 8.88E-02 G
                          883.24 1.808E-02 &   2.812E-01 8.07E-02 G
                          926.70-7.142E-03 %   2.482E-01 6.97E-02 G
                          569.26-2.140E-03 %   3.044E-01 8.80E-02 G

TH-234       9.4637E-01
                           63.29 4.279E-01 %(P 1.888E+00 5.66E-01 G K
                           92.80 1.620E+00  (P 1.475E+00 4.55E-01 G
                           92.38-1.448E-01 % P 1.643E+00 4.89E-01 G

AM-241      -2.1271E-02
                           59.54-2.127E-02 &(P 2.532E-01 7.57E-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
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

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

- -

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

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	2.5769E-03	2.6388E-03	2.4739E-01	2.4739E-01	2.779E-01
K-40		1.5351E+01	1.5351E+01	1.2490E+00	1.5433E+00	
MN-54	#A	-1.2047E-05	-1.2096E-05	2.6438E-02	2.6438E-02	2.892E-02
CO-57	#B	3.8413E-04	3.8594E-04	3.4262E-02	3.4262E-02	3.822E-02
CO-60	#B	-2.7771E-04	-2.7789E-04	3.8166E-02	3.8166E-02	3.998E-02
Sr-85	#A	-1.9393E-02	-1.9775E-02	3.7243E-02	3.7262E-02	4.014E-02
Kr-85	#A	-4.8364E+02	-4.8364E+02	9.7855E+02	9.7896E+02	9.318E+02
Y-88	#B	3.8015E-03	3.8470E-03	1.7841E-02	1.7842E-02	2.200E-02
NB-94	#B	-5.0074E-03	-5.0074E-03	3.1705E-02	3.1706E-02	3.489E-02
Ag-108M	#B	1.4844E-02	1.4844E-02	3.0170E-02	3.0183E-02	3.329E-02
CD-109	#	1.4725E+00	1.4766E+00	1.1226E+00	1.1256E+00	1.201E+00
SN-113	#B	-5.8927E-04	-5.9580E-04	1.0357E-01	1.0357E-01	3.936E-02
SB-125	#B	7.7450E-02	7.7547E-02	6.5232E-02	6.5393E-02	9.481E-02
I-131	#B	-1.0368E-02	-1.2139E-02	3.6507E-02	3.6514E-02	3.476E-02
CS-134	#B	1.9838E-02	1.9871E-02	1.7090E-02	1.7130E-02	2.466E-02
CS-137	#	1.7746E-01	1.7748E-01	7.6676E-02	7.7389E-02	
CE-139	#A	-1.4661E-04	-1.4797E-04	2.2479E-01	2.2479E-01	4.020E-02
EU-152	#B	-1.9011E-03	-1.9016E-03	1.1942E-01	1.1942E-01	1.183E-01
EU-154	#B	-1.3393E-02	-1.3398E-02	8.0159E-02	8.0162E-02	8.497E-02
EU-155	#	1.7586E-01	1.7599E-01	1.3621E-01	1.3656E-01	1.462E-01
HG-203	#B	-2.9853E-03	-3.0676E-03	4.0258E-02	4.0258E-02	3.138E-02
TL-208	#	2.7814E-01	2.7814E-01	5.7465E-02	5.9767E-02	
PB-212		7.5801E-01	7.5801E-01	8.2417E-02	9.3791E-02	
PB-214		5.3788E-01	5.3788E-01	9.7576E-02	1.0262E-01	
BI-212		5.4912E-01	5.4912E-01	3.2212E-01	3.2375E-01	
BI-214		4.8942E-01	4.8942E-01	1.1308E-01	1.1672E-01	
RA-224	#A	9.2569E-01	9.2569E-01	9.7626E-01	9.7779E-01	1.058E+00
RA-226	#	1.8492E+00	1.8492E+00	9.4920E-01	9.5546E-01	
AC-228		9.3631E-01	9.3631E-01	1.9618E-01	2.0383E-01	
TH-227	#A	-3.0281E-01	-3.0281E-01	3.5788E-01	3.5833E-01	3.873E-01
PA-234	#B	-6.3587E-03	-6.3587E-03	1.3385E-01	1.3385E-01	1.496E-01
TH-234	#B	9.4637E-01	9.4637E-01	7.9700E-01	7.9873E-01	1.888E+00
AM-241	#A	-2.1270E-02	-2.1271E-02	2.5004E-01	2.5005E-01	2.532E-01

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

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

Total Activity (1120.2 to 2000.1 keV) 2.0926119E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 2.0926146E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_3AUG2006_1345.An1

Sample description
FSS-OOL-04-04-011-F

Spectrum Filename: C:\GammaVision\Spectra\107F_3AUG2006_1345.An1

Acquisition information
Start time: 03-Aug-2006 13:45:40
Live time: 2000
Real time: 2002
Dead time: 0.08 %
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: 1.5720E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5720E+03) =
6.3613E+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	01-Aug-2006 19:05:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.3117

***** 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
74.79	150.	29.62	1.50	2.849E-02	74.81	9.600	4.715E-01	PB212
77.06	240.	18.41	1.50	2.957E-02	77.11	17.500	3.991E-01	PB212
					77.11	10.700	6.398E-01	PB214
77.06	235.	18.41	1.50	2.957E-02	77.11	17.500	3.912E-01	PB212
					77.11	10.700	6.398E-01	PB214
92.80	126.	32.13	1.65	3.438E-02	88.04	3.790	8.620E-01	CD109
					92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.17	139.	21.87	1.74	3.609E-02	185.99	3.280	1.008E+00	RA226
210.08	71.	38.25	1.64	3.422E-02				
239.29	748.	5.66	1.47	3.184E-02	238.63	43.100	4.579E-01	PB212
295.51	199.	16.10	1.24	2.766E-02	295.22	19.200	3.152E-01	PB214
338.73	150.	14.99	1.82	2.498E-02	338.40	12.010	4.213E-01	AC228
352.01	349.	9.74	1.77	2.426E-02	351.99	37.100	3.287E-01	PB214
410.56	39.	40.79	0.74	2.150E-02				
463.17	81.	27.67	1.24	1.954E-02				
463.17	81.	27.67	1.24	1.954E-02	463.51	10.000	3.446E-01	SB125
510.99	142.	15.07	1.94	1.807E-02	510.72	22.500	2.298E-01	TL208
583.51	246.	10.06	1.33	1.628E-02	583.14	86.000	1.479E-01	TL208
609.58	283.	7.48	2.14	1.574E-02	609.32	46.090	3.302E-01	BI214
727.48	63.	22.92	1.54	1.374E-02	727.17	11.800	3.250E-01	BI212
911.38	213.	11.24	2.66	1.161E-02	911.07	29.000	5.331E-01	AC228
968.38	132.	12.45	1.64	1.110E-02	968.90	17.460	5.768E-01	AC228
1120.63	78.	19.11	1.97	9.968E-03	1120.28	15.040	4.410E-01	BI214
1461.50	1099.	3.08	2.36	8.188E-03	1460.75	10.700	1.073E+01	K40
1765.56	53.	13.61	0.93	7.084E-03	1764.51	15.920	4.048E-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	
419.80	210.08	274.	71.	0.035	114.74	1.640	NP-239	s
820.73	410.56	88.	39.	0.019	122.37	0.744	EU-152	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	149.25	74.79	966.	150.	0.075	88.87	1.500s
PB-212	153.89	77.11	858.	240.	0.120	55.24	1.500D
PB-214	153.89	77.11	863.	235.	0.118	55.24	1.500D
TH-234	185.26	92.80	666.	97.	0.048	96.62	1.500D
RA-226	371.99	186.17	326.	139.	0.069	65.62	1.736s
PB-212	477.25	238.81	465.	575.	0.288	19.60	1.500s
PB-214	590.49	295.43	213.	168.	0.084	42.15	1.500
AC-228	677.06	338.73	136.	147.	0.074	44.98	1.819s
PB-214	703.84	352.12	146.	306.	0.153	23.47	1.500s
SB-125	926.30	463.35	100.	40.	0.020	107.42	1.500
TL-208	1021.58	510.99	127.	109.	0.054	45.22	1.941s
TL-208	1166.60	583.51	106.	241.	0.121	30.18	1.335
BI-214	1218.74	609.58	61.	279.	0.139	22.44	2.141s
BI-212	1454.53	727.48	51.	61.	0.031	68.76	1.541
AC-228	1822.32	911.38	76.	209.	0.104	33.71	2.662s
AC-228	1936.32	968.38	43.	130.	0.065	37.35	1.636s
BI-214	2240.82	1120.63	47.	77.	0.038	57.33	1.969s
K-40	2922.61	1461.50	13.	1094.	0.547	9.23	2.359
BI-214	3530.78	1765.56	1.	53.	0.027	40.82	0.928s

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		6.8917E-02					
			477.56	6.892E-02	%(	1.899E-01 5.67E-02	G
K-40		1.0729E+01					
			1460.75	1.073E+01	(P	1.922E-01 3.32E-01	G
MN-54		-3.7556E-03					
			834.81	-3.756E-03	%(P	3.022E-02 8.71E-03	G
CO-57		-1.9943E-05					
			122.07	-1.994E-05	&(P	2.810E-02 8.31E-03	G K
			136.43	-2.030E-04	& P	2.166E-01 6.40E-02	G
CO-60		5.4817E-03					
			1332.51	5.482E-03	%(P	2.708E-02 7.53E-03	G K
			1173.23	8.427E-03	& P	3.238E-02 9.32E-03	G K
Sr-85		-1.4640E-02					
			514.00	-1.464E-02	%(	3.149E-02 9.54E-03	G
Kr-85		-3.6491E+02					
			513.99	-3.649E+02	%(P	7.191E+02 2.16E+02	G
Y-88		-1.0371E-03					
			1836.01	-1.037E-03	%(P	2.223E-02 5.46E-03	G K
			898.02	1.212E-02	% P	2.619E-02 7.87E-03	G
NB-94		-3.7861E-03					
			871.10	-3.786E-03	&(P	2.635E-02 7.58E-03	G K
			702.50	2.919E-04	& P	2.291E-02 6.45E-03	G K
Ag-108M		-4.5507E-03					
			722.95	-4.551E-03	&(	3.244E-02 9.45E-03	G K
			614.37	-1.344E-02	%	3.325E-02 1.00E-02	G
			433.93	6.770E-03	& P	1.916E-02 5.68E-03	G
CD-109		-4.4571E-01					
			88.04	-4.457E-01	&(P	8.455E-01 2.57E-01	G
SN-113		-1.2248E-03					
			391.71	-1.225E-03	%(P	3.331E-02 9.54E-03	G K
			255.04	2.726E-01	&	1.017E+00 3.04E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	3.5900E-02						
		427.95	-1.188E-02	%(P	7.502E-02	2.18E-02	G K
		600.77	6.865E-04	% P	1.164E-01	3.28E-02	G
		636.15	-3.838E-02	& P	1.976E-01	5.71E-02	G
		463.51	1.773E-01	(P	2.174E-01	6.79E-02	G
		176.29	-1.141E-02	% P	3.935E-01	1.16E-01	G
I-131	-7.2064E-03						
		364.48	-7.206E-03	%(	2.816E-02	8.34E-03	G K
		636.97	6.786E-02	&	2.893E-01	8.41E-02	G
		284.29	4.764E-02	&	4.374E-01	1.29E-01	G
CS-134	-1.1952E-02						
		604.66	-1.195E-02	%(P	3.098E-02	9.28E-03	G K
		795.76	1.357E-02	% P	2.885E-02	8.72E-03	G
		569.29	2.906E-02	&	1.159E-01	3.39E-02	G
		801.84	-4.101E-02	% P	2.905E-01	8.34E-02	G
CS-137	4.9895E-03						
		661.62	4.989E-03	%(P	1.994E-02	5.64E-03	G
CE-139	-5.2501E-03						
		165.85	-5.250E-03	&(P	2.987E-02	8.91E-03	G
EU-152	-3.9647E-05						
		121.78	-3.965E-05	&(P	8.817E-02	2.61E-02	G K
		344.30	-1.014E-02	% P	7.536E-02	2.20E-02	G
		1408.08	-3.789E-03	% P	1.138E-01	3.01E-02	G
		964.00	4.936E-03	% P	1.833E-01	5.15E-02	G
		1112.07	-3.237E-03	% P	2.877E-01	8.19E-02	G
		778.90	-2.437E-02	% P	2.016E-01	5.77E-02	G
EU-154	4.7519E-04						
		123.10	4.752E-04	%(P	6.307E-02	1.87E-02	G K
		1274.80	-1.892E-02	% P	1.029E-01	2.98E-02	G
		723.30	-2.586E-02	& P	1.548E-01	4.51E-02	G
		1004.80	-2.618E-02	% P	1.528E-01	4.39E-02	G
EU-155	3.1931E-02						
		86.45	3.193E-02	%(	1.063E-01	3.20E-02	G K
		105.31	4.207E-02	& P	1.154E-01	3.48E-02	G
HG-203	5.0829E-03						
		279.17	5.083E-03	&(P	2.502E-02	7.40E-03	G K
		72.87	-2.689E-01	% P	8.229E-01	2.48E-01	G
		70.83	-4.671E-01	%	1.435E+00	4.33E-01	G
		82.50	-3.214E-01	&	1.630E+00	4.89E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.4792E-01						
		583.14	1.479E-01	(P	3.109E-02	1.52E-02	G
		510.72	2.298E-01	+ P	1.168E-01	4.54E-02	G
PB-212	3.7102E-01						
		238.63	3.596E-01	@(P	6.455E-02	2.41E-02	G K
							Energy duplication
		77.11	3.991E-01	*(	2.313E-01	7.35E-02	G
		74.81	4.715E-01	+ P	4.637E-01	1.43E-01	G
PB-214	2.8548E-01						
		351.99	2.922E-01	*(P	5.629E-02	2.32E-02	G K
		295.22	2.725E-01	(P	1.145E-01	3.93E-02	G
							Energy duplication
		77.11	6.398E-01	+ P	3.793E-01	1.20E-01	G
		241.92	1.332E-01	% P	4.135E-01	1.24E-01	G
BI-212	3.2502E-01						
		727.17	3.250E-01	(P	1.902E-01	7.61E-02	G K
		1620.56	1.695E-01	% P	6.510E-01	1.81E-01	G
		785.42	3.584E-01	% P	1.221E+00	3.58E-01	G
BI-214	3.3017E-01						
		609.32	3.302E-01	*(P	4.645E-02	2.51E-02	G K
		1764.51	4.048E-01	+ P	5.618E-02	5.60E-02	G
		1120.28	4.410E-01	+ P	1.989E-01	8.52E-02	G
RA-224	4.4219E-01						
		241.00	4.422E-01	%(P	7.486E-01	2.28E-01	G
RA-226	1.0076E+00						
		185.99	1.008E+00	*(	6.307E-01	2.20E-01	G
AC-228	5.4954E-01						
		911.07	5.331E-01	@(P	1.108E-01	6.12E-02	G K
		968.90	5.768E-01	@(P	1.477E-01	7.30E-02	G
		338.40	4.213E-01	- P	1.632E-01	6.46E-02	G
TH-227	-1.9358E-01						
		236.00	-1.936E-01	%(P	3.064E-01	9.35E-02	G K
		256.25	7.225E-02	& P	2.993E-01	8.89E-02	G
PA-234	1.3772E-04						
		98.44	1.377E-04	&(	9.588E-02	2.83E-02	G K
		946.00	6.013E-03	%	1.387E-01	3.93E-02	G
		131.28	-3.282E-02	%	1.282E-01	3.85E-02	G
		94.67	-7.546E-02	%	1.954E-01	5.90E-02	G
		883.24	-2.588E-02	&	1.889E-01	5.38E-02	G
		926.70	6.465E-02	%	1.595E-01	4.77E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 4.305E-02 &   1.717E-01 5.02E-02 G

TH-234       5.7506E-01
                           63.29 3.965E-01 %(P 1.397E+00 4.18E-01 G K
                                                          Energy duplication
                           92.80 8.071E-01  (P 1.025E+00 3.13E-01 G
                           92.38-1.401E-01 % P 1.237E+00 3.66E-01 G

AM-241      -2.5217E-03
                           59.54-2.522E-03 &(P 1.866E-01 5.54E-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	6.7344E-02	6.8917E-02	1.7025E-01	1.7030E-01	1.856E-01
K-40		1.0729E+01	1.0729E+01	9.9450E-01	1.1792E+00	
MN-54	#A	-3.7408E-03	-3.7556E-03	3.0665E-02	3.0665E-02	3.011E-02
CO-57	#B	-1.9853E-05	-1.9943E-05	4.3539E-02	4.3539E-02	2.797E-02

CO-60	#B	5.4782E-03	5.4817E-03	2.2592E-02	2.2595E-02	2.707E-02

Sr-85	#A	-1.4364E-02	-1.4640E-02	2.8611E-02	2.8624E-02	3.090E-02
Kr-85	#A	-3.6490E+02	-3.6491E+02	7.7801E+02	7.7831E+02	7.191E+02
Y-88	#B	-1.0252E-03	-1.0371E-03	2.6645E-02	2.6645E-02	2.197E-02
NB-94	#B	-3.7861E-03	-3.7861E-03	2.3928E-02	2.3929E-02	2.635E-02
Ag-108M	#B	-4.5506E-03	-4.5507E-03	2.8342E-02	2.8343E-02	3.244E-02
CD-109	#A	-4.4450E-01	-4.4571E-01	7.7825E-01	7.7864E-01	8.432E-01
SN-113	#B	-1.2118E-03	-1.2248E-03	5.3459E-01	5.3459E-01	3.295E-02
SB-125	#B	3.5856E-02	3.5900E-02	4.1260E-02	4.1315E-02	7.492E-02
I-131	#B	-6.1821E-03	-7.2064E-03	2.5035E-02	2.5038E-02	2.416E-02
CS-134	#B	-1.1932E-02	-1.1952E-02	2.9244E-02	2.9253E-02	3.093E-02
CS-137	#A	4.9889E-03	4.9895E-03	1.6931E-02	1.6934E-02	1.994E-02
CE-139	#A	-5.2033E-03	-5.2501E-03	2.7748E-02	2.7750E-02	2.960E-02
EU-152	#B	-3.9637E-05	-3.9647E-05	1.7040E-01	1.7040E-01	8.815E-02
EU-154	#B	4.7500E-04	4.7519E-04	5.6049E-02	5.6049E-02	6.305E-02
EU-155	#B	3.1909E-02	3.1931E-02	9.6019E-02	9.6036E-02	1.062E-01
HG-203	#B	4.9502E-03	5.0829E-03	2.2202E-02	2.2204E-02	2.436E-02
TL-208		1.4792E-01	1.4792E-01	4.5490E-02	4.6321E-02	
PB-212	#	3.7102E-01	3.7102E-01	7.4707E-02	7.7854E-02	6.455E-02
PB-214	#	2.8548E-01	2.8548E-01	6.8114E-02	7.0170E-02	5.629E-02
BI-212		3.2502E-01	3.2502E-01	2.2817E-01	2.2898E-01	
BI-214		3.3017E-01	3.3017E-01	7.5259E-02	7.7744E-02	
RA-224	#A	4.4219E-01	4.4219E-01	6.8423E-01	6.8472E-01	7.486E-01
RA-226	#	1.0076E+00	1.0076E+00	6.6119E-01	6.6386E-01	
AC-228	#	5.4954E-01	5.4954E-01	1.4083E-01	1.4452E-01	
TH-227	#B	-1.9358E-01	-1.9358E-01	2.8245E-01	2.8268E-01	3.064E-01
PA-234	#B	1.3772E-04	1.3772E-04	8.4915E-02	8.4915E-02	9.588E-02
TH-234	#B	5.7506E-01	5.7506E-01	6.6877E-01	6.6953E-01	1.397E+00
AM-241	#A	-2.5217E-03	-2.5217E-03	3.6474E-01	3.6474E-01	1.866E-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 2000.1 keV) 1.3089386E+01 pCi/gm
Total Decayed Activity (50.2 to 2000.1 keV) 1.3089388E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_3AUG2006_1425.An1

Sample description
FSS-OOL-04-04-012-F

Spectrum Filename: C:\GammaVision\Spectra\107F_3AUG2006_1425.An1

Acquisition information
Start time: 03-Aug-2006 14:25:48
Live time: 2000
Real time: 2002
Dead time: 0.08 %
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: 1.4870E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4870E+03) =
6.7249E+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: 107F_3AUG2006_1425.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	01-Aug-2006 19:10:00
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: 0.2923

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.78	191.	17.43	1.18	2.849E-02	74.81	9.600	6.348E-01	PB212
77.08	285.	9.71	1.18	2.957E-02	77.11	10.700	9.671E-01	PB214
					77.11	17.500	5.997E-01	PB212
87.34	135.	23.12	1.19	3.312E-02	86.45	32.740	1.143E-01	EU155
					88.04	3.790	PBC<MDA	CD109
93.26	136.	30.19	1.97	3.448E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.91	189.	17.58	1.65	3.611E-02	185.99	3.280	1.447E+00	RA226
209.50	66.	34.35	1.22	3.427E-02				
238.82	773.	4.42	1.30	3.189E-02	238.63	43.100	5.008E-01	PB212
241.55	150.	23.09	1.30	3.167E-02	241.00	3.900	1.084E+00	RA224
					241.92	7.470	5.705E-01	PB214
269.96	78.	34.80	2.06	2.947E-02				
295.48	176.	11.47	1.34	2.767E-02	295.22	19.200	2.940E-01	PB214
300.69	44.	37.93	1.34	2.732E-02				
338.70	193.	13.65	1.71	2.499E-02	338.40	12.010	5.746E-01	AC228
352.07	400.	7.47	1.52	2.425E-02	351.99	37.100	3.992E-01	PB214
463.22	44.	31.99	1.50	1.953E-02	463.51	10.000	PBC<MDA	SB125
510.94	180.	15.98	1.76	1.807E-02	510.72	22.500	3.262E-01	TL208
583.42	286.	8.54	1.74	1.628E-02	583.14	86.000	1.825E-01	TL208
609.66	283.	7.54	1.83	1.574E-02	609.32	46.090	3.490E-01	BI214
662.17	86.	25.93	1.47	1.476E-02	661.62	84.620	5.967E-02	CS137
727.23	84.	24.15	1.30	1.374E-02	727.17	11.800	4.635E-01	BI212
861.12	46.	36.11	1.18	1.210E-02				
911.55	208.	10.71	1.74	1.160E-02	911.07	29.000	5.512E-01	AC228
968.18	165.	10.27	1.98	1.110E-02	968.90	17.460	7.637E-01	AC228
1120.13	110.	18.88	1.94	9.971E-03	1120.28	15.040	6.625E-01	BI214

1461.44	1329.	2.82	2.17	8.188E-03	1460.75	10.700	1.373E+01	K40
1765.68	55.	13.92	2.06	7.084E-03	1764.51	15.920	4.457E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.65	209.50	224.	66.	0.033	103.05	1.222	AC-228	
539.54	269.96	241.	78.	0.039	104.41	2.056	AC-228	s
600.76	300.57	138.	54.	0.027	105.06	1.450	PB-212	sM
1721.80	861.12	76.	46.	0.023	108.34	1.181	TL-208	s

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

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.29	74.81	484.	191.	0.096	52.30	1.178D
PB-212	153.89	77.11	486.	285.	0.143	29.12	1.179A
EU-155	174.22	87.28	926.	145.	0.072	92.70	1.500
TH-234	185.86	93.10	900.	144.	0.072	86.72	1.500s
TH-234	185.83	93.08	861.	138.	0.069	81.54	1.500s
RA-226	371.46	185.91	350.	189.	0.094	52.75	1.654s
PB-212	476.89	238.63	212.	758.	0.379	13.25	1.297D
PB-214	483.47	241.92	314.	119.	0.060	67.84	1.299D
PB-214	590.34	295.36	237.	189.	0.095	44.97	1.212s
AC-228	677.02	338.70	176.	190.	0.095	40.94	1.706s
PB-214	703.75	352.07	165.	395.	0.198	22.42	1.523
SB-125	926.04	463.22	92.	44.	0.022	95.97	1.500s
TL-208	1021.33	510.87	196.	152.	0.076	46.58	1.764s
TL-208	1166.42	583.42	96.	281.	0.141	25.62	1.744s
BI-214	1218.89	609.66	73.	279.	0.139	22.62	1.827s
Ag-108M	1224.09	612.26	207.	-55.	-0.028	117.40	1.561s
CS-137	1323.91	662.17	108.	82.	0.041	77.80	1.466s
BI-212	1454.02	727.23	92.	83.	0.041	72.46	1.297s
AC-228	1822.67	911.55	85.	204.	0.102	32.14	1.739
AC-228	1935.91	968.18	38.	163.	0.081	30.82	1.981s
BI-214	2239.83	1120.13	78.	109.	0.055	56.63	1.942s
K-40	2922.49	1461.44	19.	1324.	0.662	8.46	2.174
BI-214	3531.01	1765.68	3.	55.	0.028	41.77	2.064

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		1.0417E-01					
			477.56	1.042E-01	%(	2.433E-01	7.34E-02 G
K-40		1.3733E+01					
			1460.75	1.373E+01	(P	2.361E-01	3.89E-01 G
MN-54		-1.2409E-04					
			834.81	-1.241E-04	%(P	2.728E-02	7.65E-03 G
CO-57		-7.5850E-03					
			122.07	-7.585E-03	%(P	3.239E-02	9.71E-03 G K
			136.43	-5.343E-02	& P	2.634E-01	7.89E-02 G
CO-60		7.5085E-03					
			1332.51	7.509E-03	%(P	2.985E-02	8.43E-03 G K
			1173.23	-6.101E-04	& P	4.399E-02	1.24E-02 G K
Sr-85		-2.3539E-02					
			514.00	-2.354E-02	&(	3.753E-02	1.15E-02 G
Kr-85		-5.7062E+02					
			513.99	-5.706E+02	&(P	8.582E+02	2.61E+02 G
Y-88		-1.0966E-03					
			1836.01	-1.097E-03	%(P	2.350E-02	5.77E-03 G K
			898.02	-4.691E-03	& P	3.240E-02	9.18E-03 G
NB-94		-2.8029E-03					
			871.10	-2.803E-03	%(P	2.928E-02	8.38E-03 G K
			702.50	-3.070E-04	% P	2.799E-02	7.94E-03 G K
Ag-108M		-2.8393E-03					
			722.95	-2.839E-03	%(	3.201E-02	9.23E-03 G K
			614.37	-3.562E-02	+	4.488E-02	1.39E-02 G
			433.93	-4.367E-03	% P	2.606E-02	7.57E-03 G
CD-109		1.2849E-01					
			88.04	1.285E-01	%(P	1.158E+00	3.47E-01 G
SN-113		-8.5944E-03					
			391.71	-8.594E-03	%(P	3.566E-02	1.05E-02 G K
			255.04	3.401E-01	%	1.149E+00	3.44E-01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	5.6783E-02						
		427.95	6.371E-03	&(P	7.578E-02	2.19E-02	G K
		600.77	-7.700E-04	& P	1.288E-01	3.63E-02	G
		636.15	-3.190E-03	% P	2.663E-01	7.62E-02	G
		463.51	2.060E-01	*(P	2.214E-01	7.01E-02	G
		176.29	-3.582E-02	& P	3.799E-01	1.12E-01	G
I-131	6.3990E-03						
		364.48	6.399E-03	%(	3.174E-02	9.37E-03	G K
		636.97	-1.548E-02	%	3.956E-01	1.13E-01	G
		284.29	-6.561E-03	%	5.229E-01	1.54E-01	G
CS-134	5.9921E-03						
		604.66	5.992E-03	%(P	2.217E-02	6.51E-03	G K
		795.76	1.683E-02	% P	3.080E-02	9.42E-03	G
		569.29	1.942E-02	%	1.583E-01	4.59E-02	G
		801.84	8.248E-02	% P	2.832E-01	8.33E-02	G
CS-137	5.9675E-02						
		661.62	5.967E-02	(P	3.717E-02	1.62E-02	G
CE-139	1.6327E-03						
		165.85	1.633E-03	&(P	3.251E-02	9.64E-03	G
EU-152	-2.1287E-02						
		121.78	-2.129E-02	%(P	9.709E-02	2.91E-02	G K
		344.30	-2.726E-02	% P	9.228E-02	2.75E-02	G
		1408.08	1.310E-02	% P	1.201E-01	3.30E-02	G
		964.00	-6.964E-02	% P	2.865E-01	8.46E-02	G
		1112.07	1.338E-02	% P	2.406E-01	6.80E-02	G
		778.90	4.073E-03	% P	1.844E-01	5.16E-02	G
EU-154	-1.2445E-03						
		123.10	-1.244E-03	%(P	5.795E-02	1.71E-02	G K
		1274.80	2.601E-02	% P	8.397E-02	2.46E-02	G
		723.30	-1.480E-03	% P	2.642E-01	7.74E-02	G
		1004.80	1.268E-02	& P	2.164E-01	6.22E-02	G
EU-155	1.2231E-01						
		86.45	1.223E-01	(	1.222E-01	3.78E-02	G K
		105.31	4.840E-02	% P	1.395E-01	4.20E-02	G
HG-203	9.6726E-03						
		279.17	9.673E-03	&(P	2.990E-02	8.95E-03	G K
		72.87	2.063E-02	% P	9.236E-01	2.76E-01	G
		70.83	-3.906E-01	&	1.590E+00	4.78E-01	G
		82.50	4.206E-02	%	2.040E+00	6.09E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.8245E-01						
		583.14	1.825E-01	*(P	3.134E-02	1.58E-02	G
		510.72	3.403E-01	+ P	1.517E-01	6.45E-02	G
PB-212	5.0093E-01						
		238.63	5.009E-01	(P	4.667E-02	2.26E-02	G K
							Energy duplication
		77.11	5.009E-01	}	1.851E-01	4.86E-02	G
		74.81	6.348E-01	+ P	3.496E-01	1.13E-01	G
PB-214	4.0914E-01						
		351.99	3.992E-01	(P	6.313E-02	3.02E-02	G K
		295.22	3.237E-01	- P	1.273E-01	4.97E-02	G
							Energy duplication
		77.11	7.267E-02	} P	3.909E-01	1.11E-01	G
		241.92	4.588E-01	(P	3.279E-01	1.05E-01	G
BI-212	4.6353E-01						
		727.17	4.635E-01	*(P	2.661E-01	1.14E-01	G K
		1620.56	-2.048E-01	% P	9.843E-01	2.74E-01	G
		785.42	-2.401E-01	% P	1.357E+00	3.88E-01	G
BI-214	3.4905E-01						
		609.32	3.490E-01	*(P	5.338E-02	2.67E-02	G K
		1764.51	4.457E-01	+ P	8.350E-02	6.31E-02	G
		1120.28	6.625E-01	+ P	2.654E-01	1.26E-01	G
RA-224	6.0254E-01						
		241.00	6.025E-01	%(P	8.678E-01	2.66E-01	G
RA-226	1.4474E+00						
		185.99	1.447E+00	*(	6.903E-01	2.54E-01	G
AC-228	5.5805E-01						
		911.07	5.512E-01	(P	1.232E-01	6.03E-02	G K
		968.90	7.637E-01	+ P	1.479E-01	7.95E-02	G
		338.40	5.746E-01	@(P	1.954E-01	7.98E-02	G
TH-227	-2.4328E-01						
		236.00	-2.433E-01	%(P	3.355E-01	1.03E-01	G K
		256.25	6.681E-02	% P	3.402E-01	1.01E-01	G
PA-234	-3.2883E-02						
		98.44	-3.288E-02	&(	1.209E-01	3.63E-02	G K
		946.00	-6.269E-04	%	1.388E-01	3.88E-02	G
		131.28	0.000E+00	&	1.428E-01	4.24E-02	G
		94.67	-1.087E-01	%	2.312E-01	7.01E-02	G
		883.24	7.178E-02	%	1.974E-01	5.87E-02	G
		926.70	6.805E-02	%	2.639E-01	7.74E-02	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 2.918E-02 %   2.344E-01 6.79E-02 G

TH-234       8.9857E-01
                           63.29 2.658E-01 %(P 1.558E+00 4.65E-01 G K
                           92.80 1.217E+00 *(P 1.229E+00 3.78E-01 G
                           92.38 1.487E+00 *(P 1.469E+00 4.54E-01 G

AM-241       7.6664E-03
                           59.54 7.666E-03 &(P 2.057E-01 6.12E-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	1.0176E-01	1.0417E-01	2.2015E-01	2.2023E-01	2.377E-01
K-40		1.3733E+01	1.3733E+01	1.1666E+00	1.4209E+00	
MN-54	#A	-1.2360E-04	-1.2409E-04	5.2649E-02	5.2649E-02	2.717E-02
CO-57	#B	-7.5499E-03	-7.5850E-03	2.9722E-02	2.9724E-02	3.224E-02
CO-60	#B	7.5037E-03	7.5085E-03	2.5294E-02	2.5298E-02	2.983E-02

Sr-85	#A	-2.3090E-02	-2.3539E-02	3.4520E-02	3.4548E-02	3.681E-02
Kr-85	#A	-5.7061E+02	-5.7062E+02	8.8736E+02	8.8800E+02	8.582E+02
Y-88	#B	-1.0838E-03	-1.0966E-03	2.8173E-02	2.8173E-02	2.323E-02
NB-94	#B	-2.8029E-03	-2.8029E-03	2.7050E-02	2.7050E-02	2.928E-02
Ag-108M	#B	-2.8392E-03	-2.8393E-03	2.7685E-02	2.7685E-02	3.201E-02
CD-109	#A	1.2813E-01	1.2849E-01	1.0405E+00	1.0405E+00	1.155E+00
SN-113	#B	-8.5016E-03	-8.5944E-03	4.1176E-02	4.1179E-02	3.528E-02
SB-125	#B	5.6713E-02	5.6783E-02	5.7964E-02	5.8061E-02	7.569E-02
I-131	#B	5.4779E-03	6.3990E-03	2.8102E-02	2.8105E-02	2.717E-02
CS-134	#B	5.9822E-03	5.9921E-03	1.9520E-02	1.9523E-02	2.213E-02
CS-137	#	5.9668E-02	5.9675E-02	4.8424E-02	4.8552E-02	
CE-139	#A	1.6180E-03	1.6327E-03	2.8915E-02	2.8916E-02	3.222E-02
EU-152	#B	-2.1281E-02	-2.1287E-02	8.8197E-02	8.8205E-02	9.707E-02
EU-154	#B	-1.2440E-03	-1.2445E-03	8.6813E-02	8.6813E-02	5.792E-02
EU-155	#	1.2222E-01	1.2231E-01	1.1338E-01	1.1358E-01	1.221E-01
HG-203	#B	9.4167E-03	9.6726E-03	2.6855E-02	2.6861E-02	2.911E-02
TL-208	#	1.8245E-01	1.8245E-01	4.7505E-02	4.8712E-02	
PB-212		5.0093E-01	5.0093E-01	6.7738E-02	7.3917E-02	
PB-214		4.0914E-01	4.0914E-01	9.2903E-02	9.5995E-02	
BI-212	#	4.6353E-01	4.6353E-01	3.4108E-01	3.4218E-01	
BI-214		3.4905E-01	3.4905E-01	8.0197E-02	8.2804E-02	
RA-224	#A	6.0254E-01	6.0254E-01	7.9663E-01	7.9742E-01	8.678E-01
RA-226	#	1.4474E+00	1.4474E+00	7.6349E-01	7.6826E-01	
AC-228		5.5805E-01	5.5805E-01	1.4791E-01	1.5154E-01	
TH-227	#B	-2.4328E-01	-2.4328E-01	3.0997E-01	3.1030E-01	3.355E-01
PA-234	#B	-3.2883E-02	-3.2883E-02	1.0894E-01	1.0896E-01	1.209E-01
TH-234	#B	8.9857E-01	8.9857E-01	8.2230E-01	8.2381E-01	1.558E+00
AM-241	#A	7.6663E-03	7.6664E-03	1.8364E-01	1.8364E-01	2.057E-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) 1.7703743E+01 pCi/gm
Total Decayed Activity (269.7 to 2000.1 keV) 1.7703753E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_3AUG2006_1504.An1

Sample description
FSS-OOL-04-04-001-F

Spectrum Filename: C:\GammaVision\Spectra\107F_3AUG2006_1504.An1

Acquisition information
Start time: 03-Aug-2006 15:04:27
Live time: 2000
Real time: 2002
Dead time: 0.10 %
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: 1.6070E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6070E+03) =
6.2228E+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	01-Aug-2006 15:35:00
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. 20 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2642

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
62.75	150.	31.01	1.21	1.959E-02				
62.75	150.	31.01	1.21	1.959E-02	63.29	3.900	PBC<MDA	TH234
75.03	321.	13.43	1.18	2.867E-02	74.81	9.600	9.748E-01	PB212
77.08	515.	8.40	1.18	2.962E-02	77.11	10.700	1.357E+00	PB214
					77.11	17.500	8.372E-01	PB212
87.17	134.	39.15	1.50	3.284E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	PBC<MDA	CD109
93.19	121.	38.57	1.50	3.429E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.03	242.	19.23	1.72	3.610E-02	185.99	3.280	1.718E+00	RA226
199.24	73.	40.87	0.69	3.509E-02				
209.00	137.	28.24	1.13	3.431E-02				
238.85	1160.	3.67	1.30	3.187E-02	238.63	43.100	7.002E-01	PB212
241.85	199.	16.57	1.30	3.163E-02	241.00	3.900	1.340E+00	RA224
					241.92	7.470	7.042E-01	PB214
269.92	102.	28.55	1.54	2.947E-02				
277.73	85.	37.99	0.91	2.890E-02				
295.50	273.	9.09	1.34	2.766E-02	295.22	19.200	4.242E-01	PB214
300.92	69.	26.88	1.34	2.730E-02				
328.82	97.	26.47	1.19	2.556E-02				
338.54	281.	13.09	1.39	2.500E-02	338.40	12.010	7.770E-01	AC228
352.20	482.	8.39	1.43	2.425E-02	351.99	37.100	4.451E-01	PB214
462.75	109.	21.24	1.81	1.955E-02				
462.75	109.	21.24	1.81	1.955E-02	463.51	10.000	4.566E-01	SB125
510.89	260.	11.47	2.00	1.808E-02	510.72	22.500	4.677E-01	TL208
583.51	425.	8.26	1.90	1.628E-02	583.14	86.000	2.524E-01	TL208
609.55	401.	7.80	1.67	1.574E-02	609.32	46.090	4.602E-01	BI214

662.34	59.	24.54	0.74	1.476E-02	661.62	84.620	3.759E-02	CS137
727.73	84.	20.73	1.10	1.373E-02	727.17	11.800	4.299E-01	BI212
767.80	93.	25.35	1.09	1.319E-02				
795.22	46.	30.48	1.68	1.284E-02	795.76	85.400	3.502E-02	CS134
911.69	284.	9.09	1.89	1.160E-02	911.07	29.000	6.994E-01	AC228
964.78	41.	29.33	1.80	1.113E-02	964.00	14.580	PBC<MDA	EU152
969.50	175.	9.26	1.80	1.109E-02	968.90	17.460	7.506E-01	AC228
1120.44	95.	19.68	1.90	9.969E-03	1120.28	15.040	5.267E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1461.52	1662.	2.51	2.25	8.188E-03	1460.75	10.700	1.590E+01	K40
1621.91	17.	31.98	1.20	7.569E-03	1620.56	2.750	6.908E-01	BI212
1765.33	72.	12.83	2.18	7.081E-03	1764.51	15.920	5.287E-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	
125.17	62.75	834.	150.	0.075	93.03	1.214	PA-234	l
398.11	199.24	376.	73.	0.037	122.60	0.690	SE-75	s
417.63	209.00	525.	137.	0.069	84.73	1.128	AC-228	
539.46	269.92	302.	102.	0.051	85.64	1.543	AC-228	
555.09	277.73	342.	87.	0.044	95.37	0.915	NP-239	
601.37	300.87	165.	71.	0.036	86.34	0.849	PB-212	s
657.25	328.82	225.	97.	0.049	79.42	1.193	LA-140	s
1535.17	767.80	119.	93.	0.047	76.04	1.093	BI-214	sM
1930.52	964.93	48.	44.	0.022	79.66	1.797	AC-228	D

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

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.29	74.81	658.	326.	0.163	36.76	1.178D
PB-212	153.89	77.11	675.	430.	0.215	23.44	1.179A
EU-155	174.00	87.17	1299.	134.	0.067	117.44	1.500
TH-234	186.04	93.19	1177.	121.	0.060	115.70	1.500s
RA-226	371.71	186.03	663.	242.	0.121	57.70	1.718s
TH-227	472.23	236.30	1189.	-132.	-0.066	113.88	1.500s
PB-212	476.89	238.63	292.	1143.	0.572	10.71	1.297D
PB-214	483.47	241.92	455.	190.	0.095	51.88	1.299D
PB-214	590.40	295.39	375.	356.	0.178	33.09	1.319s
AC-228	676.69	338.54	328.	277.	0.139	39.28	1.387
PB-214	704.00	352.20	316.	476.	0.238	25.16	1.427
SB-125	926.19	463.30	148.	80.	0.040	70.21	1.500s
TL-208	1021.37	510.89	204.	226.	0.113	34.42	1.998s
TL-208	1166.61	583.51	197.	420.	0.210	24.77	1.902s
BI-214	1218.69	609.55	142.	397.	0.199	23.39	1.669s
CS-137	1324.25	662.34	73.	56.	0.028	73.63	0.745s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	1455.03	727.73	86.	83.	0.041	62.19	1.096s
CS-134	1590.00	795.22	76.	46.	0.023	91.44	1.684s
AC-228	1822.95	911.69	105.	280.	0.140	27.27	1.894s
AC-228	1937.36	968.90	55.	173.	0.086	28.71	1.799D
BI-214	2240.44	1120.44	80.	94.	0.047	59.05	1.901
K-40	2922.64	1461.52	20.	1657.	0.829	7.52	2.252
BI-212	3243.44	1621.91	5.	17.	0.009	95.94	1.200s
BI-214	3530.31	1765.33	5.	71.	0.035	38.48	2.184

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		-8.6246E-02					
			477.56	-8.625E-02	%(	2.771E-01 8.28E-02	G
K-40		1.5899E+01					
			1460.75	1.590E+01	(P	2.256E-01 4.00E-01	G
MN-54		-6.2243E-03					
			834.81	-6.224E-03	&(P	3.645E-02 1.07E-02	G
CO-57		-5.5595E-03					
			122.07	-5.559E-03	%(P	3.766E-02 1.13E-02	G K
			136.43	-5.734E-02	% P	2.999E-01 9.00E-02	G
CO-60		4.6582E-03					
			1332.51	4.658E-03	&(P	3.000E-02 8.38E-03	G K
			1173.23	-3.638E-03	& P	5.011E-02 1.43E-02	G K
Sr-85		-1.6416E-02					
			514.00	-1.642E-02	%(	3.974E-02 1.20E-02	G
Kr-85		-4.0412E+02					
			513.99	-4.041E+02	%(P	9.026E+02 2.71E+02	G
Y-88		-7.0071E-03					
			1836.01	-7.007E-03	%(P	3.239E-02 9.08E-03	G K
			898.02	1.510E-03	% P	3.322E-02 9.46E-03	G
NB-94		-9.5307E-05					
			871.10	-9.531E-05	&(P	3.712E-02 1.07E-02	G K
			702.50	6.436E-03	% P	2.834E-02 8.33E-03	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	7.7426E-04						
		722.95	7.743E-04	%(	3.510E-02	1.01E-02	G K
		614.37	-6.821E-03	%	3.321E-02	9.80E-03	G
		433.93	8.163E-03	% P	2.304E-02	6.87E-03	G
CD-109	4.3978E-01						
		88.04	4.398E-01	%(P	1.045E+00	3.16E-01	G
SN-113	-3.9773E-04						
		391.71	-3.977E-04	&(P	3.962E-02	1.15E-02	G K
		255.04	-1.405E-01	&	1.271E+00	3.77E-01	G
SB-125	8.8979E-02						
		427.95	2.785E-03	%(P	8.065E-02	2.34E-02	G K
		600.77	1.316E-02	% P	1.144E-01	3.28E-02	G
		636.15	-5.207E-02	& P	2.642E-01	7.75E-02	G
		463.51	3.441E-01	(P	2.565E-01	8.34E-02	G
		176.29	-1.691E-01	& P	3.908E-01	1.18E-01	G
I-131	2.3613E-03						
		364.48	2.361E-03	%(	3.686E-02	1.08E-02	G K
		636.97	-1.030E-01	&	4.580E-01	1.35E-01	G
		284.29	4.471E-03	%	5.048E-01	1.49E-01	G
CS-134	1.6144E-02						
		604.66	-3.773E-04	%(P	2.880E-02	8.28E-03	G K
		795.76	3.502E-02	@(P	3.335E-02	1.08E-02	G
		569.29	3.509E-02	&	1.763E-01	5.19E-02	G
		801.84	5.280E-02	% P	3.040E-01	8.82E-02	G
CS-137	3.7590E-02						
		661.62	3.759E-02	(P	2.864E-02	9.82E-03	G
CE-139	7.2134E-03						
		165.85	7.213E-03	%(P	3.563E-02	1.07E-02	G
EU-152	-1.2329E-02						
		121.78	-1.233E-02	%(P	1.088E-01	3.25E-02	G K
		344.30	-1.766E-03	% P	9.591E-02	2.80E-02	G
		1408.08	-1.534E-03	% P	1.197E-01	3.21E-02	G
		964.00	-3.453E-02	% P	3.727E-01	1.10E-01	G
		1112.07	-1.146E-02	% P	3.220E-01	9.27E-02	G
		778.90	5.165E-02	& P	2.120E-01	6.22E-02	G
EU-154	-1.0163E-02						
		123.10	-1.016E-02	%(P	7.421E-02	2.22E-02	G K
		1274.80	3.267E-02	% P	9.913E-02	2.94E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          723.30-4.962E-03 & P 2.767E-01 8.14E-02 G
                         1004.80 5.070E-02 & P 1.584E-01 4.69E-02 G

EU-155       1.0450E-01
                           86.45 1.045E-01  (  1.336E-01 4.09E-02 G K
                          105.31 4.364E-02 % P 1.507E-01 4.54E-02 G

HG-203      -1.2636E-03
                          279.17-1.264E-03 %(P 3.427E-02 1.01E-02 G K
                           72.87-1.883E-01 % P 1.028E+00 3.09E-01 G
                           70.83-1.300E-01 %   1.724E+00 5.17E-01 G
                           82.50-5.889E-01 %   2.011E+00 6.06E-01 G

TL-208       2.5238E-01
                          583.14 2.524E-01  (P 4.084E-02 2.11E-02 G
                          510.72 4.677E-01 + P 1.431E-01 6.17E-02 G

PB-212       6.9945E-01
                          238.63 6.994E-01  (P 5.034E-02 2.53E-02 G K
                                                         Energy duplication
                           77.11 6.994E-01 }   2.011E-01 5.47E-02 G
                           74.81 1.003E+00 + P 3.757E-01 1.24E-01 G

PB-214       4.4512E-01
                          351.99 4.451E-01  (P 7.989E-02 3.77E-02 G K
                          295.22 5.636E-01 + P 1.471E-01 6.30E-02 G
                                                         Energy duplication
                           77.11 2.034E-01 } P 4.266E-01 1.31E-01 G
                          241.92 6.769E-01 + P 3.633E-01 1.18E-01 G

BI-212       4.7924E-01
                          727.17 4.299E-01  (P 2.383E-01 9.06E-02 G K
                         1620.56 6.908E-01  (P 5.263E-01 2.28E-01 G
                          785.42 6.039E-01 % P 1.428E+00 4.28E-01 G

BI-214       4.8734E-01
                          609.32 4.602E-01  (P 6.749E-02 3.63E-02 G K
                         1764.51 5.287E-01  (P 9.865E-02 6.87E-02 G
                         1120.28 5.267E-01  (P 2.491E-01 1.05E-01 G

RA-224       6.5600E-01
                          241.00 6.560E-01 &(P 9.787E-01 2.99E-01 G

RA-226       1.7179E+00
                          185.99 1.718E+00 *(  8.714E-01 3.30E-01 G

AC-228       7.3063E-01
                          911.07 6.994E-01 *(P 1.261E-01 6.46E-02 G K
                          968.90 7.506E-01  (P 1.620E-01 7.28E-02 G
                          338.40 7.770E-01  (P 2.438E-01 1.03E-01 G
```

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

TH-227      -3.0920E-01
                          236.00-3.092E-01 ?(P 3.821E-01 1.17E-01 G K
                          256.25 8.917E-02 % P 3.097E-01 9.24E-02 G

PA-234       1.0058E-03
                           98.44 1.006E-03 %(  1.424E-01 4.24E-02 G K
                          946.00-2.944E-02 %   1.860E-01 5.44E-02 G
                          131.28-6.582E-02 &   1.633E-01 4.94E-02 G
                           94.67-8.704E-02 %   2.550E-01 7.70E-02 G
                          883.24 0.000E+00 %   2.777E-01 7.94E-02 G
                          926.70-5.055E-02 %   2.910E-01 8.48E-02 G
                          569.26 5.197E-02 &   2.610E-01 7.69E-02 G

TH-234       1.0699E+00
                           63.29 1.016E+00 %(P 1.660E+00 5.04E-01 G K
                           92.80 7.263E-01 % P 1.368E+00 4.14E-01 G
                           92.38 1.152E+00  (P 1.551E+00 4.74E-01 G

AM-241      -4.1620E-02
                           59.54-4.162E-02 %(P 2.310E-01 6.93E-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	-8.4059E-02	-8.6246E-02	2.4844E-01	2.4849E-01	2.701E-01
K-40		1.5899E+01	1.5899E+01	1.1989E+00	1.5228E+00	
MN-54	#A	-6.1970E-03	-6.2243E-03	3.5172E-02	3.5174E-02	3.629E-02
CO-57	#B	-5.5313E-03	-5.5595E-03	3.4712E-02	3.4713E-02	3.747E-02
CO-60	#B	4.6549E-03	4.6582E-03	2.5128E-02	2.5130E-02	2.998E-02
Sr-85	#A	-1.6072E-02	-1.6416E-02	3.5992E-02	3.6005E-02	3.890E-02
Kr-85	#A	-4.0411E+02	-4.0412E+02	9.5601E+02	9.5631E+02	9.026E+02
Y-88	#B	-6.9176E-03	-7.0071E-03	3.6473E-02	3.6475E-02	3.198E-02
NB-94	#B	-9.5307E-05	-9.5307E-05	8.7165E-03	8.7165E-03	3.712E-02
Ag-108M	#B	7.7423E-04	7.7426E-04	3.0373E-02	3.0373E-02	3.510E-02
CD-109	#A	4.3846E-01	4.3978E-01	9.4913E-01	9.4944E-01	1.042E+00
SN-113	#B	-3.9302E-04	-3.9773E-04	7.4845E-02	7.4845E-02	3.915E-02
SB-125	#F	8.8858E-02	8.8979E-02	6.4677E-02	6.4890E-02	8.054E-02
I-131	#B	1.9909E-03	2.3613E-03	3.2445E-02	3.2445E-02	3.108E-02
CS-134	#B	1.6114E-02	1.6144E-02	1.4932E-02	1.4963E-02	2.875E-02
CS-137		3.7586E-02	3.7590E-02	2.9427E-02	2.9510E-02	
CE-139	#A	7.1418E-03	7.2134E-03	3.2023E-02	3.2026E-02	3.528E-02
EU-152	#B	-1.2325E-02	-1.2329E-02	9.9237E-02	9.9239E-02	1.087E-01
EU-154	#B	-1.0158E-02	-1.0163E-02	7.0553E-02	7.0555E-02	7.418E-02
EU-155	#A	1.0442E-01	1.0450E-01	1.2272E-01	1.2286E-01	1.335E-01
HG-203	#B	-1.2270E-03	-1.2636E-03	6.7116E-02	6.7116E-02	3.327E-02
TL-208		2.5238E-01	2.5238E-01	6.3191E-02	6.4925E-02	
PB-212		6.9945E-01	6.9945E-01	7.5908E-02	8.6420E-02	
PB-214		4.4512E-01	4.4512E-01	1.1318E-01	1.1620E-01	
BI-212		4.7924E-01	4.7924E-01	2.8090E-01	2.8232E-01	
BI-214		4.8734E-01	4.8734E-01	1.1523E-01	1.1877E-01	
RA-224	#A	6.5600E-01	6.5600E-01	8.9640E-01	8.9723E-01	9.787E-01
RA-226	#	1.7179E+00	1.7179E+00	9.9127E-01	9.9645E-01	
AC-228		7.3063E-01	7.3063E-01	1.3758E-01	1.4418E-01	
TH-227	#A	-3.0920E-01	-3.0920E-01	3.5285E-01	3.5333E-01	3.821E-01
PA-234	#B	1.0058E-03	1.0058E-03	1.2733E-01	1.2733E-01	1.424E-01
TH-234	#B	1.0699E+00	1.0699E+00	1.0344E+00	1.0361E+00	1.660E+00
AM-241	#A	-4.1620E-02	-4.1620E-02	2.1736E-01	2.1738E-01	2.310E-01

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

H - Halflife limit exceeded

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

Total Activity (1120.2 to 2000.1 keV) 2.0748791E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 2.0748798E+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_3AUG2006_1553.An1

Sample description
FSS-OOL-04-04-003-F

Spectrum Filename: C:\GammaVision\Spectra\107F_3AUG2006_1553.An1

Acquisition information
Start time: 03-Aug-2006 15:53:39
Live time: 2000
Real time: 2002
Dead time: 0.11 %
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: 1.6100E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6100E+03) =
6.2112E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

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

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

Corrections	Status	Comments
Decay correct to date:	YES	01-Aug-2006 16:20:00
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: 0.2992

***** 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	303.	20.13	1.50	2.849E-02				
74.85	303.	20.13	1.50	2.849E-02	74.81	9.600	9.309E-01	PB212
77.12	504.	11.64	1.50	2.957E-02	77.11	10.700	1.337E+00	PB214
					77.11	17.500	8.173E-01	PB212
77.12	509.	11.64	1.50	2.957E-02	77.11	10.700	1.337E+00	PB214
					77.11	17.500	8.250E-01	PB212
86.58	215.	26.83	0.96	3.287E-02	86.45	32.740	1.683E-01	EU155
93.21	211.	24.90	1.56	3.447E-02	92.38	2.570	1.934E+00	TH234
					92.80	3.000	1.556E+00	TH234
185.90	227.	22.81	1.11	3.611E-02	185.99	3.280	1.609E+00	RA226
209.51	100.	33.01	1.09	3.427E-02				
238.81	1193.	3.67	1.30	3.187E-02	238.63	43.100	7.188E-01	PB212
241.39	207.	20.45	1.30	3.166E-02	241.00	3.900	1.387E+00	RA224
					241.92	7.470	7.289E-01	PB214
270.46	150.	24.11	1.92	2.943E-02				
278.08	80.	39.27	1.64	2.887E-02				
278.08	80.	39.27	1.64	2.887E-02	279.17	81.500	PBC<MDA	HG203
295.42	283.	12.16	1.15	2.766E-02	295.22	19.200	4.395E-01	PB214
338.75	280.	11.02	1.70	2.498E-02	338.40	12.010	7.725E-01	AC228
352.28	516.	6.56	1.58	2.424E-02	351.99	37.100	4.765E-01	PB214
462.90	108.	24.16	1.26	1.955E-02				
462.90	108.	24.16	1.26	1.955E-02	463.51	10.000	4.519E-01	SB125
511.18	202.	12.64	1.56	1.807E-02	510.72	22.500	3.473E-01	TL208
583.48	432.	6.39	1.62	1.628E-02	583.14	86.000	2.561E-01	TL208
609.71	344.	6.98	1.45	1.573E-02	609.32	46.090	3.929E-01	BI214
662.35	114.	17.26	1.60	1.476E-02	661.62	84.620	7.406E-02	CS137
727.60	141.	17.95	1.22	1.374E-02	727.17	11.800	7.231E-01	BI212

795.75	94.	23.40	1.11	1.284E-02				
795.75	94.	23.40	1.11	1.284E-02	795.76	85.400	7.199E-02	CS134
860.54	77.	19.47	1.22	1.211E-02				
911.77	328.	7.64	1.64	1.160E-02	911.07	29.000	8.073E-01	AC228
968.40	266.	9.50	1.93	1.110E-02	968.90	17.460	1.143E+00	AC228
1120.51	150.	16.12	1.44	9.968E-03	1120.28	15.040	8.325E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1461.48	1653.	2.54	2.08	8.188E-03	1460.75	10.700	1.578E+01	K40
1621.54	34.	16.90	0.83	7.569E-03	1620.56	2.750	1.391E+00	BI212
1765.68	65.	13.97	2.13	7.084E-03	1764.51	15.920	4.831E-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	
418.67	209.51	454.	100.	0.050	99.03	1.087	AC-228	s
477.26	238.97	363.	1193.	0.597	11.02	1.297	PB-212	D
482.42	241.55	789.	207.	0.103	61.35	1.299	PB-214	D
540.54	270.46	386.	150.	0.075	72.33	1.919	AC-228	s
1720.65	860.54	58.	77.	0.039	58.42	1.217	TL-208	s

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

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.37	74.85	1763.	303.	0.152	60.39	1.500s
PB-214	153.89	77.11	1504.	504.	0.252	34.93	1.500D
PB-212	153.89	77.11	1500.	509.	0.254	34.93	1.500D
EU-155	174.01	87.17	1340.	157.	0.079	101.54	1.500
TH-234	185.75	93.04	1334.	171.	0.085	89.34	1.500s
TH-234	185.72	93.03	1304.	162.	0.081	86.80	1.500s
RA-226	371.45	185.90	818.	227.	0.113	68.43	1.114
TH-227	471.62	235.99	1114.	-130.	-0.065	112.19	1.500s
PB-212	477.23	238.80	809.	1160.	0.580	13.41	1.500s
HG-203	554.79	277.58	263.	67.	0.034	106.76	1.500s
PB-214	590.61	295.50	352.	284.	0.142	32.57	1.500
AC-228	677.11	338.75	243.	276.	0.138	33.07	1.702s
PB-214	703.93	352.16	237.	475.	0.237	19.21	1.500s
SB-125	925.58	462.99	143.	68.	0.034	79.53	1.500s
TL-208	1021.96	511.18	184.	168.	0.084	37.92	1.564s
TL-208	1166.55	583.48	115.	427.	0.214	19.17	1.621
BI-214	1219.00	609.71	97.	340.	0.170	20.94	1.445
CS-137	1324.27	662.35	101.	110.	0.055	51.79	1.603s
BI-212	1454.77	727.60	136.	140.	0.070	53.85	1.218s
CS-134	1590.24	795.34	93.	54.	0.027	84.70	1.684s
AC-228	1823.11	911.77	85.	324.	0.162	22.92	1.637

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1936.35	968.40	100.	264.	0.132	28.50	1.928s
BI-214	2240.59	1120.51	106.	149.	0.074	48.37	1.439s
K-40	2922.56	1461.48	27.	1648.	0.824	7.61	2.084
BI-212	3242.70	1621.54	1.	34.	0.017	50.71	0.833s
BI-214	3531.00	1765.68	6.	65.	0.032	41.92	2.132

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		9.5497E-03					
			477.56	9.550E-03	%(	2.301E-01 6.65E-02	G
K-40		1.5783E+01					
			1460.75	1.578E+01	(P	2.575E-01 4.02E-01	G
MN-54		2.1490E-02					
			834.81	2.149E-02	%(P	3.004E-02 9.36E-03	G
CO-57		1.8190E-03					
			122.07	1.819E-03	%(P	2.751E-02 8.16E-03	G K
			136.43	-3.478E-02	& P	2.700E-01 8.07E-02	G
CO-60		1.2644E-03					
			1332.51	1.264E-03	%(P	3.400E-02 9.41E-03	G K
			1173.23	5.032E-03	% P	4.686E-02 1.35E-02	G K
Sr-85		-1.8895E-02					
			514.00	-1.890E-02	%(	4.017E-02 1.22E-02	G
Kr-85		-4.5959E+02					
			513.99	-4.596E+02	%(P	9.124E+02 2.75E+02	G
Y-88		4.2695E-03					
			1836.01	4.269E-03	%(P	2.254E-02 6.15E-03	G K
			898.02	-7.679E-03	% P	3.345E-02 9.68E-03	G
NB-94		-9.1401E-03					
			871.10	-9.140E-03	%(P	3.330E-02 9.85E-03	G K
			702.50	9.429E-03	& P	3.190E-02 9.48E-03	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-3.0061E-02						
		722.95	-3.006E-02	&(	4.530E-02	1.39E-02	G K
		614.37	-2.955E-02	%	4.181E-02	1.29E-02	G
		433.93	-2.807E-04	% P	3.170E-02	9.22E-03	G
CD-109	-1.0876E-01						
		88.04	-1.088E-01	%(P	1.281E+00	3.84E-01	G
SN-113	-1.4747E-03						
		391.71	-1.475E-03	&(P	4.080E-02	1.19E-02	G K
		255.04	1.181E-01	&	1.283E+00	3.81E-01	G
SB-125	6.0103E-02						
		427.95	-1.836E-02	&(P	8.592E-02	2.53E-02	G K
		600.77	-2.327E-02	& P	1.691E-01	4.93E-02	G
		636.15	-6.227E-02	% P	2.626E-01	7.74E-02	G
		463.51	2.924E-01	*(P	2.517E-01	8.07E-02	G
		176.29	1.110E-01	% P	4.320E-01	1.30E-01	G
I-131	1.2322E-02						
		364.48	1.232E-02	%(	3.805E-02	1.14E-02	G K
		636.97	-7.493E-02	%	4.334E-01	1.27E-01	G
		284.29	-3.448E-02	%	5.400E-01	1.60E-01	G
CS-134	2.3536E-02						
		604.66	7.618E-03	%(P	2.005E-02	5.98E-03	G K
		795.76	4.173E-02	*(P	3.661E-02	1.19E-02	G
		569.29	4.253E-02	&	1.867E-01	5.52E-02	G
		801.84	-7.020E-02	& P	3.659E-01	1.07E-01	G
CS-137	7.4055E-02						
		661.62	7.406E-02	@(P	3.323E-02	1.32E-02	G
CE-139	-1.2402E-03						
		165.85	-1.240E-03	&(P	3.845E-02	1.14E-02	G
EU-152	1.8416E-02						
		121.78	1.842E-02	%(P	1.026E-01	3.08E-02	G K
		344.30	-2.447E-02	& P	1.036E-01	3.09E-02	G
		1408.08	2.199E-02	% P	1.195E-01	3.37E-02	G
		964.00	-1.130E-02	& P	3.823E-01	1.12E-01	G
		1112.07	1.230E-01	% P	2.251E-01	6.89E-02	G
		778.90	2.278E-02	& P	2.348E-01	6.79E-02	G
EU-154	7.0812E-03						
		123.10	7.081E-03	%(P	7.988E-02	2.39E-02	G K
		1274.80	1.128E-02	% P	1.072E-01	3.08E-02	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          723.30-1.367E-03 & P 3.255E-01 9.62E-02 G
                         1004.80 5.104E-03 & P 1.976E-01 5.65E-02 G

EU-155       1.2296E-01
                           86.45 1.230E-01  (  1.354E-01 4.16E-02 G K
                          105.31 6.644E-02 % P 1.567E-01 4.74E-02 G

HG-203       2.4721E-02
                          279.17 2.472E-02  (P 2.886E-02 8.97E-03 G K
                           72.87-6.535E-01 % P 1.083E+00 3.29E-01 G
                           70.83 6.446E-01 %   1.563E+00 4.73E-01 G
                           82.50-9.767E-01 %   2.056E+00 6.24E-01 G

TL-208       2.5611E-01
                          583.14 2.561E-01  (P 3.150E-02 1.65E-02 G
                          510.72 3.473E-01 + P 1.359E-01 5.27E-02 G

PB-212       7.0838E-01
                          238.63 7.084E-01 *(P 8.257E-02 3.21E-02 G K
                                                          Energy duplication
                           77.11 8.250E-01 +   2.971E-01 9.61E-02 G
                           74.81 9.309E-01 + P 6.087E-01 1.90E-01 G

PB-214       4.4497E-01
                          351.99 4.428E-01 @(P 6.947E-02 2.87E-02 G K
                          295.22 4.492E-01  (P 1.423E-01 4.95E-02 G
                                                          Energy duplication
                           77.11 1.337E+00 + P 4.866E-01 1.57E-01 G
                          241.92 6.554E-02 % P 5.762E-01 1.73E-01 G

BI-212       7.2314E-01
                          727.17 7.231E-01 @(P 2.956E-01 1.31E-01 G K
                         1620.56 1.391E+00 + P 2.972E-01 2.39E-01 G
                          785.42 5.818E-01 % P 1.288E+00 3.88E-01 G

BI-214       3.9295E-01
                          609.32 3.929E-01  (P 5.632E-02 2.78E-02 G K
                         1764.51 4.831E-01 + P 1.058E-01 6.85E-02 G
                         1120.28 8.325E-01 + P 2.841E-01 1.35E-01 G

RA-224       5.9070E-01
                          241.00 5.907E-01 %(P 1.017E+00 3.09E-01 G

RA-226       1.6090E+00
                          185.99 1.609E+00  (  9.639E-01 3.67E-01 G

AC-228       7.9710E-01
                          911.07 8.073E-01  (P 1.140E-01 6.25E-02 G K
                          968.90 1.143E+00 + P 2.140E-01 1.09E-01 G
                          338.40 7.725E-01 *(P 2.105E-01 8.62E-02 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -3.0364E-01
                          236.00-3.036E-01 &(P 3.693E-01 1.13E-01 G K
                          256.25 1.447E-02 & P 4.122E-01 1.22E-01 G

PA-234      -6.1190E-02
                           98.44-6.119E-02 %(  1.419E-01 4.30E-02 G K
                          946.00-2.494E-03 &   1.508E-01 4.28E-02 G
                          131.28-1.648E-02 &   1.263E-01 3.77E-02 G
                           94.67-8.806E-02 %   2.308E-01 6.98E-02 G
                          883.24-5.064E-02 %   2.604E-01 7.62E-02 G
                          926.70 7.505E-02 &   2.748E-01 8.11E-02 G
                          569.26 6.298E-02 &   2.764E-01 8.18E-02 G

TH-234       1.1409E+00
                           63.29 6.880E-01 %(P 1.770E+00 5.34E-01 G K
                           92.80 1.314E+00  (P 1.391E+00 4.27E-01 G
                           92.38 1.626E+00  (P 1.647E+00 5.07E-01 G

AM-241      -4.2859E-03
                           59.54-4.286E-03 %(P 2.320E-01 6.92E-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:                      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

- -

***** 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	9.3072E-03	9.5497E-03	1.9965E-01	1.9965E-01	2.243E-01
K-40		1.5783E+01	1.5783E+01	1.2043E+00	1.5230E+00	
MN-54	#A	2.1396E-02	2.1490E-02	2.8082E-02	2.8111E-02	2.990E-02
CO-57	#B	1.8098E-03	1.8190E-03	2.4491E-02	2.4491E-02	2.737E-02
CO-60	#B	1.2635E-03	1.2644E-03	2.8235E-02	2.8235E-02	3.397E-02
Sr-85	#A	-1.8499E-02	-1.8895E-02	3.6526E-02	3.6543E-02	3.933E-02
Kr-85	#A	-4.5958E+02	-4.5959E+02	9.5106E+02	9.5145E+02	9.123E+02
Y-88	#B	4.2148E-03	4.2695E-03	1.8464E-02	1.8466E-02	2.225E-02
NB-94	#B	-9.1401E-03	-9.1401E-03	3.0174E-02	3.0179E-02	3.330E-02
Ag-108M	#B	-3.0060E-02	-3.0061E-02	4.1818E-02	4.1855E-02	4.530E-02
CD-109	#A	-1.0843E-01	-1.0876E-01	1.1985E+00	1.1985E+00	1.277E+00
SN-113	#B	-1.4572E-03	-1.4747E-03	2.2725E-01	2.2725E-01	4.032E-02
SB-125	#B	6.0021E-02	6.0103E-02	4.9777E-02	4.9904E-02	8.580E-02
I-131	#B	1.0387E-02	1.2322E-02	3.4214E-02	3.4222E-02	3.207E-02
CS-134	#F	2.3493E-02	2.3536E-02	2.0129E-02	2.0177E-02	2.001E-02
CS-137	#	7.4046E-02	7.4055E-02	3.9582E-02	3.9823E-02	
CE-139	#A	-1.2279E-03	-1.2402E-03	4.0151E-02	4.0151E-02	3.807E-02
EU-152	#B	1.8410E-02	1.8416E-02	9.2253E-02	9.2258E-02	1.026E-01
EU-154	#B	7.0781E-03	7.0812E-03	7.1610E-02	7.1611E-02	7.984E-02
EU-155	#A	1.2287E-01	1.2296E-01	1.2485E-01	1.2504E-01	1.353E-01
HG-203	#A	2.4003E-02	2.4721E-02	2.6902E-02	2.6942E-02	2.802E-02
TL-208		2.5611E-01	2.5611E-01	4.9616E-02	5.1871E-02	
PB-212	#	7.0838E-01	7.0838E-01	9.6263E-02	1.0496E-01	8.257E-02
PB-214	#	4.4497E-01	4.4497E-01	8.5348E-02	8.9303E-02	6.947E-02
BI-212	#	7.2314E-01	7.2314E-01	3.9298E-01	3.9529E-01	
BI-214		3.9295E-01	3.9295E-01	8.3329E-02	8.6501E-02	
RA-224	#A	5.9070E-01	5.9070E-01	9.2836E-01	9.2901E-01	1.017E+00
RA-226		1.6090E+00	1.6090E+00	1.1011E+00	1.1052E+00	
AC-228		7.9710E-01	7.9710E-01	1.6229E-01	1.6898E-01	
TH-227	#A	-3.0364E-01	-3.0364E-01	3.4136E-01	3.4183E-01	3.693E-01
PA-234	#B	-6.1190E-02	-6.1190E-02	1.2887E-01	1.2892E-01	1.419E-01
TH-234	#B	1.1409E+00	1.1409E+00	1.0230E+00	1.0249E+00	1.770E+00
AM-241	#A	-4.2858E-03	-4.2859E-03	3.2132E-01	3.2132E-01	2.320E-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 2000.1 keV) 1.9635746E+01 pCi/gm
Total Decayed Activity (270.2 to 2000.1 keV) 1.9635759E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab