Yankee Chemistry Spectrum name: 101F_5JAN2005_1715.An1

Sample description
Detector 101 FSS-OOL-14-01-020-F-B SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_5JAN2005_1715.An1

Acquisition information

Start time:	05-Jan-2005 17:08:35
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:	1.5220E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.5220E+03) = 6.5703E+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_5JAN2005_1715.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	14-Dec-2004 15:00:00
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	

total peaks alloc. 20 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2634

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.82	151.	29.43	1.50	1.654E-02				
74.82	151.	29.43	1.50	1.654E-02	74.81	9.600	8.416E-01	PB212
77.11	306.	13.99	1.50	1.720E-02	77.11	10.700	1.477E+00	PB214
					77.11	17.500	9.029E-01	PB212
77.11	306.	13.99	1.50	1.720E-02	77.11	10.700	1.477E+00	PB214
					77.11	17.500	9.029E-01	PB212
92.98	113.	34.50	1.50	1.989E-02	92.38	2.570	1.963E+00	TH234
					92.80	3.000	1.678E+00	TH234
92.98	111.	35.68	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.649E+00	TH234
185.70	139.	23.38	1.18	1.860E-02	185.99	3.280	2.019E+00	RA226
238.68	642.	4.59	1.12	1.557E-02	238.63	43.100	8.498E-01	PB212
241.94	151.	12.84	1.12	1.540E-02	241.00	3.900	2.223E+00	RA224
					241.92	7.470	1.164E+00	PB214
270.01	94.	25.32	0.93	1.401E-02				
295.22	196.	10.64	1.12	1.292E-02	295.22	19.200	7.004E-01	PB214
300.30	49.	34.84	0.99	1.272E-02				
338.35	133.	18.80	1.09	1.135E-02	338.40	12.010	8.663E-01	AC228
351.94	260.	9.55	1.18	1.093E-02				
351.94	260.	9.55	1.18	1.093E-02	351.99	37.100	5.700E-01	PB214
462.99	71.	25.55	0.79	8.351E-03				
462.99	71.	25.55	0.79	8.351E-03	463.51	10.000	7.672E-01	SB125
510.42	92.	19.26	1.39	7.595E-03	510.72	22.500	4.783E-01	TL208
582.98	182.	10.18	1.28	6.686E-03	583.14	86.000	2.819E-01	TL208
609.26	201.	8.71	1.38	6.413E-03	609.32	46.090	6.044E-01	BI214
727.23	31.	33.83	1.50	5.443E-03	723.30	19.700	PBC<MDA	EU154

					727.17	11.800	4.290E-01	BI212
910.84	141.	12.37	1.69	4.447E-03	911.07	29.000	9.709E-01	AC228
968.36	122.	14.74	1.80	4.214E-03	968.90	17.460	1.473E+00	AC228
1119.96	58.	21.81	1.85	3.711E-03	1120.28	15.040	9.227E-01	BI214

Yankee Chemistry Spectrum name: 101F_5JAN2005_1715.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1460.35	497.	4.56	1.93	2.943E-03	1460.75	10.700	1.402E+01	K40
1763.81	39.	16.01	1.17	2.482E-03	1764.51	15.920	8.766E-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	
477.08	238.66	114.	642.	0.321	13.77	1.122	PB-212	D
539.74	270.01	173.	94.	0.047	75.97	0.934	AC-228	s
600.36	300.30	109.	49.	0.024	104.52	0.989	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	149.20	74.82	906.	151.	0.075	88.29	1.499
PB-214	153.79	77.11	764.	306.	0.153	41.96	1.499D
PB-212	153.79	77.11	764.	306.	0.153	41.96	1.499D
TH-234	185.55	92.98	727.	111.	0.055	107.05	1.499s
TH-234	185.54	92.98	701.	113.	0.056	103.51	1.499s
RA-226	371.10	185.72	330.	140.	0.070	66.57	1.173s
PB-212	477.01	238.66	322.	461.	0.230	21.65	1.499
RA-224	481.70	241.00	353.	96.	0.048	88.86	1.123D
PB-214	590.19	295.22	161.	183.	0.091	36.88	1.499D
AC-228	676.49	338.35	164.	133.	0.067	56.39	1.092
PB-214	703.68	351.94	112.	247.	0.123	26.38	1.499
SB-125	926.30	463.20	82.	38.	0.019	112.72	1.499s
TL-208	1020.79	510.42	74.	92.	0.046	57.78	1.392s
TL-208	1165.96	582.98	52.	182.	0.091	30.54	1.279s
BI-214	1218.57	609.26	38.	201.	0.101	26.13	1.379
BI-212	1454.60	727.23	40.	31.	0.016	101.48	1.499s
AC-228	1822.03	910.84	48.	141.	0.071	37.11	1.695
AC-228	1937.13	968.36	48.	122.	0.061	44.23	1.803s
BI-214	2240.50	1119.96	34.	58.	0.029	65.43	1.845s
K-40	2921.72	1460.35	4.	497.	0.249	13.69	1.927
BI-214	3529.05	1763.81	0.	39.	0.020	48.04	1.166s

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

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

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		-6.0446E-02					
			477.56	-6.045E-02	%(	5.707E-01 1.64E-01	G
K-40		1.4024E+01					
			1460.75	1.402E+01	(	3.292E-01 6.40E-01	G
MN-54		-1.2922E-02					
			834.81	-1.292E-02	%(	5.417E-02 1.57E-02	G
CO-57		-1.0088E-02					
			122.07	-1.009E-02	&(P	6.039E-02 1.80E-02	G K
			136.43	-3.470E-03	%	4.826E-01 1.43E-01	G
CO-60		1.0783E-02					
			1332.51	1.078E-02	%(P	7.141E-02 1.88E-02	G K
			1173.23	1.458E-02	% P	7.860E-02 2.16E-02	G K
Sr-85		-2.2185E-02					
			514.00	-2.219E-02	%(	8.599E-02 2.55E-02	G
Kr-85		-4.0490E+02					
			513.99	-4.049E+02	%(	1.568E+03 4.65E+02	G
Y-88		-1.6555E-03					
			1836.01	-1.655E-03	%(P	5.538E-02 1.30E-02	G K
			898.02	1.018E-02	% P	5.736E-02 1.61E-02	G
NB-94		1.8264E-03					
			871.10	1.826E-03	%(	4.861E-02 1.33E-02	G K
			702.50	2.813E-03	&	5.486E-02 1.55E-02	G K
Ag-108M		2.9466E-02					
			722.95	2.947E-02	&(	4.091E-02 1.31E-02	G K
			614.37	-9.721E-03	%	5.653E-02 1.64E-02	G
			433.93	-3.657E-04	%	4.918E-02 1.40E-02	G
CD-109		1.0357E-01					
			88.04	1.036E-01	&(	1.685E+00 5.02E-01	G
SN-113		-2.0447E-03					
			391.71	-2.045E-03	%(P	7.762E-02 2.21E-02	G K
			255.04	3.728E-02	&	2.041E+00 5.93E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	9.5295E-02						
		427.95	-1.074E-02	%(	1.392E-01	3.99E-02	G K
		600.77	7.952E-02	%	2.402E-01	7.11E-02	G
		636.15	-1.681E-02	%	4.130E-01	1.16E-01	G
		463.51	4.092E-01	(	4.860E-01	1.54E-01	G
		176.29	-1.139E-01	%	7.269E-01	2.16E-01	G
I-131	-2.0455E-02						
		364.48	-2.045E-02	%(	3.668E-01	1.06E-01	G K
		636.97	-2.318E-01	%	4.347E+00	1.22E+00	G
		284.29	-1.073E+00	%	5.212E+00	1.55E+00	G
CS-134	-1.5300E-03						
		604.66	-1.530E-03	&(	1.413E-01	4.17E-02	G K
		795.76	-2.256E-03	%	6.617E-02	1.85E-02	G
		569.29	1.301E-01	%	3.078E-01	9.26E-02	G
		801.84	1.962E-01	%	6.172E-01	1.82E-01	G
CS-137	5.6030E-02						
		661.62	5.603E-02	%(	7.505E-02	2.35E-02	G
CE-139	-8.8100E-05						
		165.85	-8.810E-05	%(P	6.639E-02	1.96E-02	G
EU-152	-6.5925E-04						
		121.78	-6.593E-04	&(	1.511E-01	4.47E-02	G K
		344.30	-2.299E-03	%	1.756E-01	5.09E-02	G
		1408.08	5.455E-02	%	2.372E-01	6.65E-02	G
		964.00	1.967E-02	%	6.746E-01	1.94E-01	G
		1112.07	1.936E-01	%	5.187E-01	1.54E-01	G
		778.90	-2.538E-02	%	4.124E-01	1.16E-01	G
EU-154	-1.8402E-02						
		123.10	-1.840E-02	&(	1.187E-01	3.54E-02	G K
		1274.80	6.048E-02	&	1.926E-01	5.64E-02	G
		723.30	-3.942E-02	&	3.188E-01	9.17E-02	G
		1004.80	0.000E+00	&	3.503E-01	9.61E-02	G
EU-155	1.2197E-02						
		86.45	1.220E-02	&(	2.082E-01	6.21E-02	G K
		105.31	6.265E-02	%	2.406E-01	7.22E-02	G
HG-203	-1.2731E-02						
		279.17	-1.273E-02	&(P	8.385E-02	2.44E-02	G K
		72.87	-8.940E-01	&	1.955E+00	5.93E-01	G
		70.83	1.184E+00	%	3.089E+00	9.33E-01	G
		82.50	-3.254E-01	%	3.895E+00	1.16E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.8187E-01						
		583.14	2.819E-01	@(	5.634E-02	2.87E-02	G
		510.72	4.783E-01	+	2.225E-01	9.21E-02	G
PB-212	6.0957E-01						
		238.63	6.096E-01	(	1.143E-01	4.40E-02	G K Energy duplication
		77.11	9.029E-01	+	3.878E-01	1.26E-01	G
		74.81	8.416E-01	+	7.994E-01	2.48E-01	G
PB-214	5.7935E-01						
		351.99	5.405E-01	(	1.140E-01	4.75E-02	G K Energy duplication
		295.22	6.544E-01	(	2.215E-01	8.05E-02	G Energy duplication
		77.11	1.477E+00	+	6.343E-01	2.07E-01	G
		241.92	-1.213E-02	%	9.567E-01	2.84E-01	G
BI-212	4.2895E-01						
		727.17	4.290E-01	@(	4.427E-01	1.45E-01	G K
		1620.56	4.413E-01	&	1.719E+00	4.81E-01	G
		785.42	7.583E-01	&	2.409E+00	7.08E-01	G
BI-214	6.0442E-01						
		609.32	6.044E-01	(	9.421E-02	5.26E-02	G K
		1764.51	8.766E-01	+	1.656E-01	1.40E-01	G
		1120.28	9.227E-01	+	4.754E-01	2.01E-01	G
RA-224	1.4092E+00						
		241.00	1.409E+00	(	1.331E+00	4.17E-01	G
RA-226	2.0394E+00						
		185.99	2.039E+00	*(	1.273E+00	4.52E-01	G
AC-228	9.4024E-01						
		911.07	9.709E-01	(	2.410E-01	1.20E-01	G K
		968.90	1.473E+00	+	4.225E-01	2.17E-01	G
		338.40	8.663E-01	(	4.064E-01	1.63E-01	G
TH-227	-9.0196E-02						
		236.00	-9.020E-02	%(	4.886E-01	1.46E-01	G K
		256.25	8.368E-02	&	6.368E-01	1.88E-01	G
PA-234	-5.1756E-04						
		98.44	-5.176E-04	&(	2.086E-01	6.19E-02	G K
		946.00	3.277E-02	&	2.940E-01	8.28E-02	G
		131.28	-8.637E-03	&	2.522E-01	7.49E-02	G
		94.67	-1.157E-01	%	3.790E-01	1.14E-01	G
		883.24	-6.284E-02	%	4.633E-01	1.31E-01	G
		926.70	2.146E-01	%	4.273E-01	1.31E-01	G

Yankee Chemistry Spectrum name: 101F_5JAN2005_1715.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		569.26	1.891E-01	%	4.474E-01	1.35E-01	G
TH-234	1.3778E+00						
		63.29	7.835E-01	%(	2.604E+00	7.84E-01	G K
		92.80	1.678E+00	*(	1.875E+00	5.79E-01	G
		92.38	1.930E+00	*(	2.234E+00	6.89E-01	G
AM-241	-1.9076E-03						
		59.54	-1.908E-03	&(P	3.166E-01	9.37E-02	G

(- This peak used in the nuclide activity average.

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

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

- -

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

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-4.5378E-02	-6.0446E-02	4.9253E-01	4.9255E-01	4.285E-01
K-40		1.4024E+01	1.4024E+01	1.9193E+00	2.0765E+00	
MN-54	#A	-1.2303E-02	-1.2922E-02	4.7000E-02	4.7005E-02	5.158E-02
CO-57	#B	-9.5314E-03	-1.0088E-02	6.1925E-02	6.1928E-02	5.706E-02
CO-60	#B	1.0698E-02	1.0783E-02	5.6460E-02	5.6463E-02	7.084E-02

Sr-85	#A	-1.7519E-02	-2.2185E-02	7.6571E-02	7.6582E-02	6.791E-02
Kr-85	#A	-4.0483E+02	-4.0490E+02	1.3962E+03	1.3964E+03	1.568E+03
Y-88	#B	-1.4340E-03	-1.6555E-03	1.7942E-01	1.7942E-01	4.797E-02
NB-94	#B	1.8264E-03	1.8264E-03	3.9918E-02	3.9918E-02	4.861E-02
Ag-108M	#B	2.9456E-02	2.9466E-02	3.9407E-02	3.9442E-02	4.090E-02
CD-109	#A	1.0013E-01	1.0357E-01	1.5074E+00	1.5074E+00	1.629E+00
SN-113	#B	-1.7900E-03	-2.0447E-03	2.2472E+00	2.2472E+00	6.795E-02
SB-125	#B	9.3863E-02	9.5295E-02	1.0742E-01	1.0755E-01	1.371E-01
I-131	#B	-3.0461E-03	-2.0455E-02	3.1878E-01	3.1878E-01	5.462E-02
CS-134	#B	-1.4992E-03	-1.5300E-03	1.2521E-01	1.2521E-01	1.385E-01
CS-137	#A	5.5952E-02	5.6030E-02	7.0597E-02	7.0668E-02	7.495E-02
CE-139	#A	-7.8816E-05	-8.8100E-05	1.6488E-02	1.6488E-02	5.940E-02
EU-152	#B	-6.5708E-04	-6.5925E-04	1.3406E-01	1.3406E-01	1.506E-01
EU-154	#B	-1.8311E-02	-1.8402E-02	1.0628E-01	1.0629E-01	1.181E-01
EU-155	#B	1.2094E-02	1.2197E-02	1.8644E-01	1.8644E-01	2.064E-01
HG-203	#B	-9.1653E-03	-1.2731E-02	1.9120E-01	1.9120E-01	6.036E-02
TL-208	#	2.8187E-01	2.8187E-01	8.6095E-02	8.7555E-02	
PB-212	#	6.0957E-01	6.0957E-01	1.3195E-01	1.3637E-01	1.143E-01
PB-214	#	5.7935E-01	5.7935E-01	1.3136E-01	1.3538E-01	1.140E-01
BI-212	#A	4.2895E-01	4.2895E-01	4.3531E-01	4.3599E-01	4.427E-01
BI-214		6.0442E-01	6.0442E-01	1.5792E-01	1.6157E-01	
RA-224		1.4092E+00	1.4092E+00	1.2523E+00	1.2548E+00	
RA-226	#	2.0394E+00	2.0394E+00	1.3576E+00	1.3625E+00	
AC-228		9.4024E-01	9.4024E-01	3.1736E-01	3.2178E-01	
TH-227	#B	-9.0196E-02	-9.0196E-02	4.3707E-01	4.3710E-01	4.886E-01
PA-234	#B	-5.1756E-04	-5.1756E-04	1.8566E-01	1.8566E-01	2.086E-01
TH-234	#B	1.3778E+00	1.3778E+00	1.4262E+00	1.4283E+00	2.604E+00
AM-241	#A	-1.9075E-03	-1.9076E-03	6.3851E-01	6.3851E-01	3.166E-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) 1.9299330E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 1.9299383E+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_5JAN2005_1750.An1

Sample description
Detector 101 FSS-OOL-14-01-009-F- SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_5JAN2005_1750.An1

Acquisition information

Start time:	05-Jan-2005 17:45:19
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:	1.5520E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.5520E+03) = 6.4433E+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_5JAN2005_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	14-Dec-2004 14:47:00
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	

total peaks alloc. 16 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
74.68	215.	14.33	1.00	1.651E-02				
74.68	215.	14.33	1.00	1.651E-02	74.81	9.600	1.177E+00	PB212
77.05	317.	14.02	1.50	1.720E-02	77.11	10.700	1.497E+00	PB214
					77.11	17.500	9.154E-01	PB212
77.05	317.	14.02	1.50	1.720E-02	77.11	10.700	1.497E+00	PB214
					77.11	17.500	9.154E-01	PB212
78.04	101.	34.45	1.01	1.746E-02	77.11	10.700	4.779E-01	PB214
					77.11	17.500	2.922E-01	PB212
83.90	63.	39.26	1.01	1.872E-02				
87.09	156.	17.12	1.01	1.922E-02	86.45	32.740	2.195E-01	EU155
90.00	95.	27.38	1.02	1.960E-02	88.04	3.790	1.174E+00	CD109
93.05	130.	19.60	1.02	1.994E-02	92.38	2.570	2.224E+00	TH234
					92.80	3.000	1.901E+00	TH234
185.72	90.	27.84	0.96	1.860E-02				
185.72	90.	27.84	0.96	1.860E-02	185.99	3.280	1.286E+00	RA226
209.35	78.	28.49	0.79	1.721E-02				
238.69	696.	4.52	1.12	1.557E-02	238.63	43.100	9.025E-01	PB212
241.73	104.	20.91	1.12	1.541E-02	241.00	3.900	1.505E+00	RA224
					241.92	7.470	7.880E-01	PB214
270.29	60.	28.38	1.06	1.400E-02				
295.29	183.	10.42	1.16	1.291E-02	295.22	19.200	6.413E-01	PB214
299.69	44.	33.94	1.16	1.274E-02				
328.35	52.	31.41	1.17	1.168E-02				
338.31	102.	15.62	1.06	1.135E-02	338.40	12.010	6.516E-01	AC228
351.96	282.	8.79	1.11	1.093E-02				
351.96	282.	8.79	1.11	1.093E-02	351.99	37.100	6.050E-01	PB214

510.66	87.	19.01	1.26	7.591E-03	510.72	22.500	4.451E-01	TL208
583.00	224.	9.92	1.26	6.686E-03	583.14	86.000	3.390E-01	TL208
609.23	235.	8.71	1.30	6.414E-03	609.32	46.090	6.917E-01	BI214
727.51	86.	22.86	1.12	5.441E-03	727.17	11.800	1.162E+00	BI212
795.24	45.	25.22	1.53	5.019E-03				
795.24	45.	25.22	1.53	5.019E-03	795.76	85.400	9.418E-02	CS134
911.03	138.	10.70	1.65	4.447E-03	911.07	29.000	9.332E-01	AC228
968.25	100.	15.52	0.94	4.215E-03	968.90	17.460	1.184E+00	AC228

Yankee Chemistry Spectrum name: 101F_5JAN2005_1750.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1120.44	46.	32.52	2.00	3.711E-03	1120.28	15.040	7.208E-01	BI214
1460.43	542.	4.41	1.89	2.943E-03	1460.75	10.700	1.499E+01	K40
1764.28	30.	18.53	2.11	2.481E-03	1764.51	15.920	6.655E-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	
167.37	84.11	270.	63.	0.031	117.78	1.011	TA-182	lD
179.57	90.21	294.	95.	0.048	82.14	1.016	PB-214	lD
418.37	209.35	198.	78.	0.039	85.47	0.789	AC-228	s
477.08	238.70	147.	696.	0.348	13.56	1.122	PB-212	D
483.16	241.74	185.	104.	0.052	62.72	1.124	PB-214	D
540.30	270.29	115.	60.	0.030	85.15	1.057	AC-228	
599.12	299.80	88.	44.	0.022	101.82	1.164	TH-227	lD
656.48	328.35	104.	52.	0.026	94.23	1.171	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	149.31	74.87	957.	178.	0.089	76.91	1.499s
PB-214	153.79	77.11	826.	317.	0.158	42.05	1.499D
PB-212	153.79	77.11	826.	317.	0.158	42.05	1.499D
EU-155	173.54	86.98	814.	128.	0.064	98.24	1.499
TH-234	185.68	93.05	699.	142.	0.071	83.09	1.499s
TH-234	185.65	93.03	675.	141.	0.070	82.40	1.499s
RA-226	371.40	185.87	442.	101.	0.050	93.24	1.499s
PB-212	477.09	238.70	350.	546.	0.273	19.39	1.499
RA-224	483.08	241.69	414.	99.	0.049	92.47	1.499
PB-214	590.42	295.34	181.	149.	0.074	45.64	1.499
AC-228	676.40	338.31	76.	102.	0.051	46.87	1.059
PB-214	703.63	351.92	102.	278.	0.139	23.68	1.499
TL-208	1021.26	510.66	70.	87.	0.044	57.04	1.263s
TL-208	1166.01	583.00	79.	224.	0.112	29.77	1.259
BI-214	1218.50	609.23	57.	235.	0.117	26.12	1.300s
BI-212	1455.18	727.51	69.	86.	0.043	68.57	1.121s
CS-134	1590.05	794.91	26.	35.	0.018	79.82	1.502
AC-228	1822.42	911.03	29.	138.	0.069	32.11	1.648s

Yankee Chemistry Spectrum name: 101F_5JAN2005_1750.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1936.90	968.25	44.	100.	0.050	46.55	0.940s
BI-214	2241.47	1120.44	53.	46.	0.023	97.56	1.999s
K-40	2921.87	1460.43	8.	542.	0.271	13.24	1.888
BI-214	3529.99	1764.28	1.	30.	0.015	55.58	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	COMMENTS
BE-7		-2.6927E-02					
			477.56	-2.693E-02	&(	5.103E-01 1.45E-01	G
K-40		1.4987E+01					
			1460.75	1.499E+01	(	4.417E-01 6.61E-01	G
MN-54		2.0966E-02					
			834.81	2.097E-02	%(	5.551E-02 1.65E-02	G
CO-57		-1.2818E-02					
			122.07	-1.282E-02	&(P	5.784E-02 1.73E-02	G K
			136.43	6.440E-02	%	4.747E-01 1.42E-01	G
CO-60		-1.7813E-02					
			1332.51	-1.781E-02	&(P	6.689E-02 1.51E-02	G K
			1173.23	-1.789E-02	& P	8.051E-02 2.05E-02	G K
Sr-85		-2.1979E-02					
			514.00	-2.198E-02	%(	8.016E-02 2.38E-02	G
Kr-85		-4.0055E+02					
			513.99	-4.005E+02	%(	1.461E+03 4.34E+02	G
Y-88		-1.0224E-02					
			1836.01	-1.022E-02	&(P	7.621E-02 2.04E-02	G K
			898.02	-7.426E-03	% P	6.469E-02 1.78E-02	G
NB-94		-3.2312E-04					
			871.10	-3.231E-04	&(	5.283E-02 1.45E-02	G K
			702.50	2.063E-02	%	5.269E-02 1.58E-02	G K
Ag-108M		-2.2130E-02					
			722.95	-2.213E-02	&(	7.945E-02 2.35E-02	G K
			614.37	-7.458E-04	%	5.521E-02 1.55E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		433.93	-6.815E-03	&	4.736E-02	1.37E-02	G
CD-109	4.6427E-02						
		88.04	4.643E-02	%(	1.586E+00	4.72E-01	G
SN-113	-1.9754E-02						
		391.71	-1.975E-02	%(P	8.311E-02	2.44E-02	G K
		255.04	2.536E-01	%	2.406E+00	7.09E-01	G
SB-125	2.1290E-02						
		427.95	2.129E-02	%(	1.533E-01	4.46E-02	G K
		600.77	4.816E-02	%	2.483E-01	7.18E-02	G
		636.15	1.120E-01	%	3.836E-01	1.12E-01	G
		463.51	2.352E-01	%	4.775E-01	1.45E-01	G
		176.29	-7.202E-02	%	7.666E-01	2.28E-01	G
I-131	0.0000E+00						
		364.48	0.000E+00	&(	3.391E-01	9.73E-02	G K
		636.97	5.221E-01	%	3.749E+00	1.06E+00	G
		284.29	-2.354E-02	&	4.932E+00	1.44E+00	G
CS-134	2.8956E-02						
		604.66	-9.528E-03	%(	5.428E-02	1.57E-02	G K
		795.76	7.294E-02	(	5.508E-02	1.94E-02	G
		569.29	2.420E-02	%	2.828E-01	8.02E-02	G
		801.84	-1.048E-01	%	6.336E-01	1.81E-01	G
CS-137	2.1683E-02						
		661.62	2.168E-02	&(	5.822E-02	1.74E-02	G
CE-139	8.0309E-05						
		165.85	8.031E-05	%(P	5.545E-02	1.63E-02	G
EU-152	-3.2821E-02						
		121.78	-3.282E-02	%(	1.651E-01	4.94E-02	G K
		344.30	1.176E-02	&	1.555E-01	4.52E-02	G
		1408.08	1.165E-01	%	1.947E-01	6.23E-02	G
		964.00	-5.722E-02	%	6.588E-01	1.90E-01	G
		1112.07	-8.745E-02	&	6.714E-01	1.94E-01	G
		778.90	0.000E+00	%	4.033E-01	1.12E-01	G
EU-154	2.8374E-02						
		123.10	2.837E-02	&(	1.144E-01	3.43E-02	G K
		1274.80	2.051E-02	&	1.974E-01	5.52E-02	G
		723.30	2.391E-03	%	3.663E-01	1.05E-01	G
		1004.80	-1.892E-02	&	3.382E-01	9.38E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.7975E-01						
		86.45	1.797E-01	(	1.906E-01	5.89E-02	G K
		105.31	7.352E-02	%	2.308E-01	6.95E-02	G
HG-203	1.7361E-02						
		279.17	1.736E-02	&(P	6.838E-02	2.02E-02	G K
		72.87	-3.798E-02	&	2.366E+00	7.09E-01	G
		70.83	-1.215E+00	%	3.337E+00	1.01E+00	G
		82.50	-1.485E+00	%	4.117E+00	1.24E+00	G
TL-208	3.3898E-01						
		583.14	3.390E-01	(	6.692E-02	3.36E-02	G
		510.72	4.451E-01	+	2.122E-01	8.46E-02	G
PB-212	7.0832E-01						
		238.63	7.083E-01	(	1.166E-01	4.58E-02	G K
							Energy duplication
		77.11	9.154E-01	+	3.951E-01	1.28E-01	G
		74.81	9.783E-01	+	8.053E-01	2.51E-01	G
PB-214	5.7132E-01						
		351.99	5.971E-01	(	1.068E-01	4.71E-02	G K
		295.22	5.215E-01	(	2.297E-01	7.93E-02	G
							Energy duplication
		77.11	1.497E+00	+	6.463E-01	2.10E-01	G
		241.92	-6.240E-01	%	9.317E-01	2.85E-01	G
BI-212	1.1618E+00						
		727.17	1.162E+00	*(	5.627E-01	2.66E-01	G K
		1620.56	5.510E-01	%	1.423E+00	4.21E-01	G
		785.42	6.286E-01	%	2.736E+00	7.95E-01	G
BI-214	6.9197E-01						
		609.32	6.917E-01	@(	1.118E-01	6.02E-02	G K
		1764.51	6.655E-01	?(	1.624E-01	1.23E-01	G
		1120.28	7.208E-01	@(	5.706E-01	2.34E-01	G
RA-224	1.4272E+00						
		241.00	1.427E+00	(	1.409E+00	4.40E-01	G
RA-226	1.4420E+00						
		185.99	1.442E+00	@(	1.438E+00	4.48E-01	G
AC-228	1.0274E+00						
		911.07	9.332E-01	@(	1.872E-01	9.99E-02	G K
		968.90	1.184E+00	(	3.981E-01	1.84E-01	G
		338.40	6.516E-01	-	2.768E-01	1.02E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-6.5873E-02						
		236.00	-6.587E-02	%(	4.794E-01	1.43E-01	G K
		256.25	6.239E-02	&	5.890E-01	1.73E-01	G
PA-234	7.4040E-02						
		98.44	7.404E-02	&(	1.792E-01	5.42E-02	G K
		946.00	-5.445E-02	%	2.923E-01	8.37E-02	G
		131.28	4.523E-02	&	2.370E-01	7.09E-02	G
		94.67	-1.738E-01	%	3.755E-01	1.14E-01	G
		883.24	1.679E-02	&	4.915E-01	1.37E-01	G
		926.70	0.000E+00	%	6.248E-01	1.75E-01	G
		569.26	3.686E-02	%	3.987E-01	1.13E-01	G
TH-234	1.5350E+00						
		63.29	5.560E-01	&(	2.465E+00	7.39E-01	G K
		92.80	2.051E+00	(	1.806E+00	5.63E-01	G
		92.38	2.419E+00	(	2.150E+00	6.70E-01	G
AM-241	-6.6720E-02						
		59.54	-6.672E-02	&(P	3.488E-01	1.04E-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_5JAN2005_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	-2.0206E-02	-2.6927E-02	4.3417E-01	4.3417E-01	3.829E-01
K-40		1.4987E+01	1.4987E+01	1.9840E+00	2.1572E+00	
MN-54	#A	1.9961E-02	2.0966E-02	4.9603E-02	4.9617E-02	5.285E-02
CO-57	#B	-1.2110E-02	-1.2818E-02	5.7621E-02	5.7625E-02	5.464E-02
CO-60	#B	-1.7671E-02	-1.7813E-02	5.8562E-01	5.8562E-01	6.636E-02
Sr-85	#A	-1.7350E-02	-2.1979E-02	7.1414E-02	7.1425E-02	6.327E-02
Kr-85	#A	-4.0048E+02	-4.0055E+02	1.3016E+03	1.3018E+03	1.461E+03
Y-88	#B	-8.8543E-03	-1.0224E-02	7.5104E-02	7.5106E-02	6.600E-02
NB-94	#B	-3.2311E-04	-3.2312E-04	4.3514E-02	4.3514E-02	5.283E-02
Ag-108M	#B	-2.2123E-02	-2.2130E-02	7.0528E-02	7.0539E-02	7.943E-02
CD-109	#A	4.4882E-02	4.6427E-02	1.4152E+00	1.4152E+00	1.533E+00
SN-113	#B	-1.7290E-02	-1.9754E-02	8.8641E-02	8.8648E-02	7.274E-02
SB-125	#B	2.0970E-02	2.1290E-02	1.3378E-01	1.3379E-01	1.510E-01
I-131	#B	0.0000E+00	0.0000E+00	2.9182E-01	2.9182E-01	5.034E-02
CS-134	#B	2.8372E-02	2.8956E-02	2.3113E-02	2.3171E-02	5.318E-02
CS-137	#A	2.1652E-02	2.1683E-02	5.2084E-02	5.2099E-02	5.814E-02
CE-139	#A	7.1834E-05	8.0309E-05	4.8963E-02	4.8963E-02	4.960E-02
EU-152	#B	-3.2712E-02	-3.2821E-02	1.4820E-01	1.4821E-01	1.645E-01
EU-154	#B	2.8234E-02	2.8374E-02	1.0291E-01	1.0292E-01	1.138E-01
EU-155	#A	1.7823E-01	1.7975E-01	1.7658E-01	1.7686E-01	1.890E-01
HG-203	#B	1.2492E-02	1.7361E-02	6.0527E-02	6.0535E-02	4.920E-02
TL-208		3.3898E-01	3.3898E-01	1.0090E-01	1.0270E-01	
PB-212	#	7.0832E-01	7.0832E-01	1.3736E-01	1.4307E-01	1.166E-01
PB-214	#	5.7132E-01	5.7132E-01	1.3530E-01	1.3910E-01	1.068E-01
BI-212	#	1.1618E+00	1.1618E+00	7.9666E-01	7.9936E-01	
BI-214	#	6.9197E-01	6.9197E-01	1.8072E-01	1.8491E-01	
RA-224	#	1.4272E+00	1.4272E+00	1.3197E+00	1.3221E+00	1.409E+00
RA-226	#	1.4419E+00	1.4420E+00	1.3445E+00	1.3470E+00	1.438E+00
AC-228		1.0274E+00	1.0274E+00	2.9053E-01	2.9627E-01	
TH-227	#B	-6.5873E-02	-6.5873E-02	4.2766E-01	4.2767E-01	4.794E-01
PA-234	#B	7.4040E-02	7.4040E-02	1.6252E-01	1.6257E-01	1.792E-01
TH-234	#B	1.5350E+00	1.5350E+00	1.2648E+00	1.2677E+00	2.465E+00
AM-241	#A	-6.6714E-02	-6.6720E-02	3.2014E-01	3.2016E-01	3.488E-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_5JAN2005_1750.An1

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

Total Activity (270.1 to 1999.1 keV) 1.8206732E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.8206732E+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_5JAN2005_1830.An1

Sample description
Detector 101 FSS-OOL-14-01-006-F- SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_5JAN2005_1830.An1

Acquisition information

Start time:	05-Jan-2005 18:22:10
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:	1.7610E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.7610E+03) = 5.6786E+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_5JAN2005_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	14-Dec-2004 15:05:00
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: 0.0995

***** 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	235.	20.21	1.50	1.654E-02				
74.81	235.	20.21	1.50	1.654E-02	74.81	9.600	1.135E+00	PB212
77.05	291.	15.94	1.50	1.720E-02	77.11	10.700	1.213E+00	PB214
					77.11	17.500	7.415E-01	PB212
77.05	291.	15.94	1.50	1.720E-02	77.11	10.700	1.213E+00	PB214
					77.11	17.500	7.415E-01	PB212
93.04	146.	28.46	1.50	1.989E-02	92.38	2.570	2.195E+00	TH234
					92.80	3.000	1.876E+00	TH234
93.06	148.	28.34	1.50	1.985E-02	92.38	2.570	2.226E+00	TH234
					92.80	3.000	1.903E+00	TH234
185.98	97.	37.31	1.00	1.858E-02				
185.98	97.	37.31	1.00	1.858E-02	185.99	3.280	1.216E+00	RA226
238.67	750.	4.28	1.12	1.557E-02	238.63	43.100	8.571E-01	PB212
241.91	129.	15.73	1.12	1.540E-02	241.00	3.900	1.649E+00	RA224
270.60	70.	31.33	0.96	1.399E-02				
295.26	183.	10.13	1.16	1.293E-02				
295.26	183.	10.13	1.16	1.293E-02	295.22	19.200	5.656E-01	PB214
300.12	52.	28.51	1.16	1.273E-02				
327.75	45.	32.91	1.20	1.170E-02				
338.34	166.	17.68	1.20	1.135E-02	338.40	12.010	9.356E-01	AC228
351.95	311.	7.25	1.16	1.093E-02				
351.95	311.	7.25	1.16	1.093E-02	351.99	37.100	5.888E-01	PB214
462.66	57.	27.48	1.34	8.357E-03				
462.66	57.	27.48	1.34	8.357E-03	463.51	10.000	5.361E-01	SB125
511.01	116.	17.05	1.82	7.586E-03	510.72	22.500	5.230E-01	TL208
582.87	219.	9.37	1.38	6.687E-03				

582.87	219.	9.37	1.38	6.687E-03	583.14	86.000	2.922E-01	TL208
609.12	215.	9.47	1.20	6.415E-03	609.32	46.090	5.572E-01	BI214
661.48	57.	29.60	1.09	5.939E-03	661.62	84.620	8.718E-02	CS137
727.15	45.	22.62	1.37	5.443E-03	727.17	11.800	5.424E-01	BI212
785.59	45.	29.72	1.23	5.075E-03	785.42	2.000	3.372E+00	BI212
859.72	30.	33.81	1.43	4.681E-03				
910.67	140.	12.04	1.74	4.448E-03	911.07	29.000	8.331E-01	AC228
966.78	124.	12.70	2.26	4.220E-03	968.90	17.460	1.295E+00	AC228
1120.12	75.	21.30	1.74	3.711E-03	1120.28	15.040	1.026E+00	BI214

Yankee Chemistry Spectrum name: 101F_5JAN2005_1830.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1460.43	556.	4.43	1.77	2.943E-03	1460.75	10.700	1.356E+01	K40
1764.37	38.	16.22	1.70	2.481E-03	1764.51	15.920	7.382E-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	
477.04	238.66	141.	750.	0.375	12.85	1.122	PB-212	D
483.52	241.90	143.	129.	0.065	47.18	1.124	PB-214	D
540.93	270.60	178.	70.	0.035	93.98	0.960	AC-228	s
599.51	299.88	106.	62.	0.031	79.59	0.751	TH-227	
655.27	327.75	94.	45.	0.023	98.73	1.198	AC-228	
1021.95	511.01	130.	68.	0.034	80.37	1.818	TL-208	s
1719.74	859.72	29.	30.	0.015	101.43	1.428	TL-208	s

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

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
HG-203	145.32	72.88	1106.	-124.	-0.062	116.80	1.499
PB-212	149.18	74.81	1009.	235.	0.117	60.62	1.499
PB-214	153.79	77.11	930.	291.	0.145	47.82	1.499D
PB-212	153.79	77.11	930.	291.	0.145	47.82	1.499D
TH-234	185.70	93.06	805.	148.	0.074	85.01	1.499s
TH-234	185.66	93.04	789.	146.	0.073	85.37	1.499s
RA-226	371.63	185.99	444.	83.	0.042	112.07	1.499s
PB-212	477.06	238.68	402.	610.	0.305	18.49	1.499
RA-224	483.84	242.07	456.	96.	0.048	98.79	1.499
PB-214	590.17	295.21	169.	185.	0.092	37.14	1.499
AC-228	676.45	338.34	218.	166.	0.083	53.03	1.204s
PB-214	703.54	351.87	102.	299.	0.149	22.53	1.499
SB-125	926.01	463.06	67.	52.	0.026	79.22	1.499
TL-208	1021.06	510.56	80.	70.	0.035	64.64	1.499s
TL-208	1166.11	583.05	44.	204.	0.102	25.13	1.499
BI-214	1218.27	609.12	68.	215.	0.107	28.41	1.199
CS-137	1323.04	661.48	69.	57.	0.029	88.81	1.091s
BI-212	1454.45	727.15	29.	45.	0.023	67.86	1.375
BI-212	1570.52	785.15	29.	28.	0.014	99.08	1.499
AC-228	1821.70	910.67	48.	140.	0.070	36.11	1.743s

Yankee Chemistry Spectrum name: 101F_5JAN2005_1830.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1937.89	968.74	49.	58.	0.029	64.51	1.616s
BI-214	2240.82	1120.12	49.	75.	0.037	63.89	1.744s
K-40	2921.88	1460.43	14.	556.	0.278	13.28	1.769
BI-214	3530.17	1764.37	0.	38.	0.019	48.67	1.697

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

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

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-9.5849E-02					
			477.56	-9.585E-02	&(	6.001E-01 1.75E-01	G
K-40		1.3564E+01					
			1460.75	1.356E+01	(	4.834E-01 6.00E-01	G
MN-54		3.5532E-03					
			834.81	3.553E-03	%(	4.608E-02 1.28E-02	G
CO-57		-7.5910E-03					
			122.07	-7.591E-03	&(P	5.528E-02 1.65E-02	G K
			136.43	8.311E-02	&	4.254E-01 1.27E-01	G
CO-60		2.4366E-03					
			1332.51	2.437E-03	%(P	6.140E-02 1.56E-02	G K
			1173.23	1.940E-02	% P	7.381E-02 2.08E-02	G K
Sr-85		-2.7995E-02					
			514.00	-2.799E-02	&(	7.941E-02 2.38E-02	G
Kr-85		-5.1017E+02					
			513.99	-5.102E+02	&(	1.447E+03 4.34E+02	G
Y-88		-1.1784E-02					
			1836.01	-1.178E-02	%(P	6.885E-02 1.87E-02	G K
			898.02	1.132E-02	% P	5.257E-02 1.49E-02	G
NB-94		-1.0320E-02					
			871.10	-1.032E-02	%(	5.338E-02 1.54E-02	G K
			702.50	5.647E-03	%	4.183E-02 1.19E-02	G K
Ag-108M		-6.2999E-04					
			722.95	-6.300E-04	%(	6.356E-02 1.80E-02	G K
			614.37	1.355E-02	&	4.490E-02 1.32E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		433.93	-5.959E-04	&	4.143E-02	1.18E-02	G
CD-109	8.8378E-02						
		88.04	8.838E-02	%(	1.528E+00	4.56E-01	G
SN-113	-4.2375E-03						
		391.71	-4.238E-03	&(P	7.971E-02	2.30E-02	G K
		255.04	-3.333E-01	&	2.451E+00	7.27E-01	G
SB-125	1.2318E-01						
		427.95	1.845E-03	%(	1.053E-01	2.96E-02	G K
		600.77	4.535E-03	&	2.617E-01	7.43E-02	G
		636.15	7.514E-02	%	3.875E-01	1.12E-01	G
		463.51	4.823E-01	(	3.820E-01	1.27E-01	G
		176.29	-7.041E-02	&	6.900E-01	2.05E-01	G
I-131	-1.0841E-03						
		364.48	-1.084E-03	&(	3.475E-01	1.01E-01	G K
		636.97	8.835E-01	%	3.752E+00	1.09E+00	G
		284.29	1.190E-01	&	3.995E+00	1.16E+00	G
CS-134	3.8398E-04						
		604.66	3.840E-04	%(	5.544E-02	1.58E-02	G K
		795.76	-1.950E-03	%	6.446E-02	1.82E-02	G
		569.29	6.962E-02	%	3.060E-01	8.97E-02	G
		801.84	-1.082E-01	%	5.399E-01	1.55E-01	G
CS-137	8.7180E-02						
		661.62	8.718E-02	@(	6.335E-02	2.58E-02	G
CE-139	-1.8968E-02						
		165.85	-1.897E-02	%(P	6.450E-02	1.94E-02	G
EU-152	-2.2014E-02						
		121.78	-2.201E-02	&(	1.542E-01	4.61E-02	G K
		344.30	-1.612E-04	%	1.539E-01	4.46E-02	G
		1408.08	2.812E-02	%	2.573E-01	7.07E-02	G
		964.00	1.295E-01	%	5.477E-01	1.61E-01	G
		1112.07	-1.768E-03	%	4.256E-01	1.17E-01	G
		778.90	-8.360E-02	%	3.793E-01	1.10E-01	G
EU-154	-1.8378E-02						
		123.10	-1.838E-02	%(	1.127E-01	3.37E-02	G K
		1274.80	4.962E-02	&	1.825E-01	5.31E-02	G
		723.30	-1.705E-01	&	3.736E-01	1.13E-01	G
		1004.80	1.141E-01	&	3.508E-01	1.04E-01	G

Yankee Chemistry Spectrum name: 101F_5JAN2005_1830.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.1859E-02						
		86.45	1.186E-02	%(	1.957E-01	5.85E-02	G K
		105.31	8.838E-02	%	1.980E-01	6.00E-02	G
HG-203	4.7937E-03						
		279.17	4.794E-03	%(P	6.606E-02	1.93E-02	G K
		72.87	-1.194E+00	%	1.797E+00	5.48E-01	G
		70.83	-2.488E+00	&	3.160E+00	9.69E-01	G
		82.50	-4.831E-02	&	3.647E+00	1.09E+00	G
TL-208	2.8166E-01						
		583.14	2.727E-01	(	4.500E-02	2.28E-02	G
		510.72	3.160E-01	*(	1.990E-01	6.81E-02	G
PB-212	7.1049E-01						
		238.63	6.979E-01	(	1.100E-01	4.30E-02	G K
							Energy duplication
		77.11	7.415E-01	(	3.691E-01	1.18E-01	G
		74.81	1.135E+00	&	7.284E-01	2.29E-01	G
PB-214	5.6762E-01						
		351.99	5.658E-01	(	9.445E-02	4.25E-02	G K
		295.22	5.711E-01	(	1.957E-01	7.07E-02	G
							Energy duplication
		77.11	1.213E+00	+	6.037E-01	1.93E-01	G
		241.92	2.612E-01	%	4.952E-01	1.51E-01	G
BI-212	5.4244E-01						
		727.17	5.424E-01	(	3.301E-01	1.23E-01	G K
		1620.56	4.674E-01	%	1.712E+00	4.87E-01	G
		785.42	2.117E+00	+	2.095E+00	6.99E-01	G
BI-214	5.5718E-01						
		609.32	5.572E-01	(	1.071E-01	5.27E-02	G K
		1764.51	7.382E-01	+	1.432E-01	1.20E-01	G
		1120.28	1.026E+00	+	4.876E-01	2.18E-01	G
RA-224	1.2289E+00						
		241.00	1.229E+00	(	1.303E+00	4.05E-01	G
RA-226	1.0504E+00						
		185.99	1.050E+00	*(	1.270E+00	3.92E-01	G
AC-228	8.6316E-01						
		911.07	8.331E-01	(	2.083E-01	1.00E-01	G K
		968.90	6.069E-01	&	3.691E-01	1.30E-01	G
		338.40	9.356E-01	@(	4.024E-01	1.65E-01	G

Yankee Chemistry Spectrum name: 101F_5JAN2005_1830.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-3.3559E-02						
		236.00	-3.356E-02	%(	4.254E-01	1.26E-01	G K
		256.25	-7.650E-02	&	6.191E-01	1.83E-01	G
PA-234	3.5532E-03						
		98.44	3.553E-03	%(	1.851E-01	5.50E-02	G K
		946.00	-2.986E-02	&	3.060E-01	8.71E-02	G
		131.28	-2.592E-02	%	2.288E-01	6.83E-02	G
		94.67	-1.659E-01	%	3.584E-01	1.09E-01	G
		883.24	-3.742E-03	%	3.777E-01	1.03E-01	G
		926.70	-8.813E-03	%	4.768E-01	1.32E-01	G
		569.26	1.012E-01	%	4.449E-01	1.30E-01	G
TH-234	1.6952E+00						
		63.29	1.206E+00	%(	2.407E+00	7.31E-01	G K
		92.80	1.876E+00	(	1.718E+00	5.34E-01	G
		92.38	2.226E+00	&(	2.030E+00	6.31E-01	G
AM-241	-5.9102E-02						
		59.54	-5.910E-02	%(P	3.408E-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

Yankee Chemistry Spectrum name: 101F_5JAN2005_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	-7.1911E-02	-9.5849E-02	5.2627E-01	5.2630E-01	4.502E-01
K-40		1.3564E+01	1.3564E+01	1.8007E+00	1.9570E+00	
MN-54	#A	3.3828E-03	3.5532E-03	3.8514E-02	3.8514E-02	4.387E-02
CO-57	#B	-7.1716E-03	-7.5910E-03	5.7833E-02	5.7834E-02	5.223E-02
CO-60	#B	2.4173E-03	2.4366E-03	4.6928E-02	4.6928E-02	6.091E-02
Sr-85	#A	-2.2095E-02	-2.7995E-02	7.1420E-02	7.1438E-02	6.267E-02
Kr-85	#A	-5.1008E+02	-5.1017E+02	1.3015E+03	1.3019E+03	1.447E+03
Y-88	#B	-1.0204E-02	-1.1784E-02	6.5768E-02	6.5771E-02	5.962E-02
NB-94	#B	-1.0320E-02	-1.0320E-02	4.6206E-02	4.6209E-02	5.338E-02
Ag-108M	#B	-6.2978E-04	-6.2999E-04	5.4121E-02	5.4121E-02	6.354E-02
CD-109	A	8.5436E-02	8.8378E-02	1.3680E+00	1.3680E+00	1.478E+00
SN-113	#B	-3.7086E-03	-4.2375E-03	1.5861E-01	1.5861E-01	6.976E-02
SB-125	#F	1.2132E-01	1.2318E-01	9.7587E-02	9.7835E-02	1.037E-01
I-131	#B	-1.6079E-04	-1.0841E-03	3.0161E-01	3.0161E-01	5.154E-02
CS-134	#B	3.7624E-04	3.8398E-04	4.7454E-02	4.7454E-02	5.432E-02
CS-137	#	8.7058E-02	8.7180E-02	7.7421E-02	7.7577E-02	
CE-139	#A	-1.6965E-02	-1.8968E-02	5.8645E-02	5.8655E-02	5.769E-02
EU-152	#B	-2.1941E-02	-2.2014E-02	1.3824E-01	1.3825E-01	1.537E-01
EU-154	#B	-1.8288E-02	-1.8378E-02	1.0115E-01	1.0115E-01	1.122E-01
EU-155	#B	1.1759E-02	1.1859E-02	1.7553E-01	1.7554E-01	1.941E-01
HG-203	#B	3.4485E-03	4.7937E-03	5.7762E-02	5.7763E-02	4.752E-02
TL-208	#	2.8166E-01	2.8166E-01	7.0780E-02	7.2548E-02	4.500E-02
PB-212	#	7.1049E-01	7.1049E-01	1.3134E-01	1.3734E-01	1.100E-01
PB-214	#	5.6762E-01	5.6762E-01	1.2329E-01	1.2740E-01	9.445E-02
BI-212		5.4244E-01	5.4244E-01	3.6809E-01	3.6937E-01	
BI-214		5.5718E-01	5.5718E-01	1.5828E-01	1.6139E-01	
RA-224	#A	1.2289E+00	1.2289E+00	1.2140E+00	1.2160E+00	1.303E+00
RA-226	#A	1.0504E+00	1.0504E+00	1.1772E+00	1.1787E+00	1.270E+00
AC-228	#	8.6316E-01	8.6316E-01	2.7690E-01	2.8116E-01	
TH-227	#B	-3.3559E-02	-3.3559E-02	3.7829E-01	3.7830E-01	4.254E-01
PA-234	#B	3.5532E-03	3.5532E-03	1.6497E-01	1.6497E-01	1.851E-01
TH-234	#B	1.6952E+00	1.6952E+00	1.2324E+00	1.2359E+00	2.407E+00
AM-241	#A	-5.9096E-02	-5.9102E-02	3.1293E-01	3.1295E-01	3.407E-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_5JAN2005_1830.An1

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

Total Activity (270.1 to 1999.1 keV) 1.5613580E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.5613702E+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_5JAN2005_1905.An1

Sample description
Detector 101 FSS-OOL-14-01-017-FB SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_5JAN2005_1905.An1

Acquisition information

Start time:	05-Jan-2005 18:58:43
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:	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:	1.5120E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.5120E+03) = 6.6138E+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_5JAN2005_1905.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	14-Dec-2004 15:07:00
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: 0.2110

***** 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	174.	26.79	1.50	1.654E-02	74.81	9.600	9.804E-01	PB212
77.02	298.	15.06	1.50	1.720E-02	77.11	10.700	1.447E+00	PB214
					77.11	17.500	8.848E-01	PB212
77.02	298.	15.06	1.50	1.720E-02	77.11	10.700	1.447E+00	PB214
					77.11	17.500	8.848E-01	PB212
93.06	144.	28.56	1.50	1.985E-02	92.38	2.570	2.531E+00	TH234
					92.80	3.000	2.163E+00	TH234
93.09	140.	29.14	1.50	1.989E-02	92.38	2.570	2.459E+00	TH234
					92.80	3.000	2.102E+00	TH234
185.71	128.	28.06	1.11	1.860E-02				
185.71	128.	28.06	1.11	1.860E-02	185.99	3.280	1.880E+00	RA226
205.36	47.	40.13	1.10	1.744E-02				
209.44	65.	29.71	1.10	1.721E-02				
238.67	733.	4.32	1.12	1.557E-02	238.63	43.100	9.755E-01	PB212
241.91	114.	17.54	1.12	1.540E-02	241.00	3.900	1.684E+00	RA224
					241.92	7.470	8.819E-01	PB214
269.89	84.	25.05	1.42	1.402E-02				
295.28	169.	11.49	1.03	1.292E-02	295.22	19.200	6.089E-01	PB214
338.30	172.	15.54	1.26	1.135E-02	338.40	12.010	1.126E+00	AC228
351.92	338.	7.82	1.21	1.093E-02				
351.92	338.	7.82	1.21	1.093E-02	351.99	37.100	7.453E-01	PB214
462.46	63.	31.72	0.73	8.360E-03				
462.46	63.	31.72	0.73	8.360E-03	463.51	10.000	6.832E-01	SB125
510.74	106.	17.35	1.72	7.590E-03	510.72	22.500	5.568E-01	TL208
583.00	211.	8.80	1.51	6.686E-03	583.14	86.000	3.276E-01	TL208
609.02	291.	7.43	1.24	6.416E-03	609.32	46.090	8.800E-01	BI214

661.60	58.	30.00	0.87	5.938E-03	661.62	84.620	1.033E-01	CS137
726.82	42.	27.89	1.21	5.445E-03	727.17	11.800	5.900E-01	BI212
795.19	28.	33.18	1.50	5.016E-03	795.76	85.400	6.010E-02	CS134
910.94	146.	11.41	1.51	4.447E-03	911.07	29.000	1.009E+00	AC228
969.01	73.	19.92	1.45	4.212E-03	968.90	17.460	8.823E-01	AC228

Yankee Chemistry Spectrum name: 101F_5JAN2005_1905.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1119.26	82.	22.62	0.80	3.714E-03	1120.28	15.040	1.320E+00	BI214
1460.39	558.	4.58	1.75	2.943E-03	1460.75	10.700	1.585E+01	K40
1763.69	37.	16.44	1.52	2.481E-03	1764.51	15.920	8.371E-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	
410.40	205.37	151.	47.	0.023	120.40	1.098	U-235	lD
418.57	209.45	228.	59.	0.030	115.39	1.134	AC-228	s
477.06	238.68	135.	732.	0.366	12.97	1.122	PB-212	D
539.50	269.89	156.	84.	0.042	75.15	1.421	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	149.16	74.79	1001.	174.	0.087	80.37	1.499s
PB-214	153.79	77.11	859.	298.	0.149	45.18	1.499D
PB-212	153.79	77.11	859.	298.	0.149	45.18	1.499D
TH-234	185.71	93.06	779.	144.	0.072	85.69	1.499s
TH-234	185.76	93.09	766.	140.	0.070	87.43	1.499s
RA-226	371.72	186.03	421.	119.	0.059	78.16	1.499s
PB-212	477.02	238.66	352.	542.	0.271	19.53	1.499
RA-224	481.70	241.00	384.	84.	0.042	104.56	1.123D
PB-214	590.19	295.22	164.	163.	0.082	40.73	1.499
AC-228	676.38	338.30	174.	172.	0.086	46.62	1.262s
PB-214	703.54	351.87	79.	329.	0.164	20.16	1.499
SB-125	925.79	462.95	81.	34.	0.017	124.85	1.499s
TL-208	1021.42	510.74	76.	106.	0.053	52.05	1.719s
TL-208	1166.01	583.00	49.	211.	0.105	26.40	1.509s
BI-214	1218.08	609.02	55.	291.	0.146	22.28	1.238
CS-137	1323.28	661.60	72.	58.	0.029	90.01	0.871s
BI-212	1453.79	726.82	41.	42.	0.021	83.67	1.209
CS-134	1590.60	795.19	30.	28.	0.014	99.55	1.502s
AC-228	1822.23	910.94	38.	146.	0.073	34.24	1.512
AC-228	1938.44	969.01	41.	73.	0.036	59.77	1.446s
BI-214	2239.10	1119.26	58.	82.	0.041	67.86	0.801s
K-40	2921.80	1460.39	20.	558.	0.279	13.74	1.751

Yankee Chemistry Spectrum name: 101F_5JAN2005_1905.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3528.82	1763.69	0.	37.	0.019	49.32	1.524

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

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

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-5.1346E-03					
			477.56	-5.135E-03	%(	6.001E-01 1.71E-01	G
K-40		1.5854E+01					
			1460.75	1.585E+01	(	6.611E-01 7.26E-01	G
MN-54		1.3789E-02					
			834.81	1.379E-02	%(	6.586E-02 1.91E-02	G
CO-57		-1.3353E-04					
			122.07	-1.335E-04	%(P	6.589E-02 1.96E-02	G K
			136.43	-4.536E-03	%	5.315E-01 1.58E-01	G
CO-60		1.7773E-02					
			1332.51	1.777E-02	%(P	6.969E-02 1.88E-02	G K
			1173.23	2.190E-02	% P	8.069E-02 2.27E-02	G K
Sr-85		-4.0148E-02					
			514.00	-4.015E-02	&(	8.840E-02 2.67E-02	G
Kr-85		-7.3147E+02					
			513.99	-7.315E+02	&(	1.611E+03 4.87E+02	G
Y-88		-5.1631E-03					
			1836.01	-5.163E-03	%(P	6.108E-02 1.52E-02	G K
			898.02	-1.012E-03	% P	7.128E-02 1.94E-02	G
NB-94		9.5357E-04					
			871.10	9.536E-04	%(	4.621E-02 1.25E-02	G K
			702.50	-1.111E-02	&	5.681E-02 1.65E-02	G K
Ag-108M		-1.8987E-02					
			722.95	-1.899E-02	&(	7.727E-02 2.27E-02	G K
			614.37	2.948E-04	%	6.159E-02 1.74E-02	G
			433.93	6.580E-04	%	5.434E-02 1.56E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	-1.6126E-01						
		88.04	-1.613E-01	&(	1.866E+00	5.58E-01	G
SN-113	2.0489E-02						
		391.71	2.049E-02	%(P	7.820E-02	2.31E-02	G K
		255.04	3.565E-02	&	2.833E+00	8.33E-01	G
SB-125	1.1851E-01						
		427.95	3.503E-02	&(	1.642E-01	4.83E-02	G K
		600.77	-1.060E-01	%	2.970E-01	8.86E-02	G
		636.15	1.613E-01	%	4.154E-01	1.24E-01	G
		463.51	3.656E-01	@(	4.858E-01	1.52E-01	G
		176.29	1.217E-02	%	7.424E-01	2.19E-01	G
I-131	0.0000E+00						
		364.48	0.000E+00	%(	4.006E-01	1.16E-01	G K
		636.97	1.439E+00	&	4.532E+00	1.34E+00	G
		284.29	-8.555E-01	&	5.504E+00	1.63E+00	G
CS-134	2.8048E-02						
		604.66	0.000E+00	%(	1.649E-01	4.89E-02	G K
		795.76	6.010E-02	(	5.989E-02	1.99E-02	G
		569.29	2.576E-02	%	2.746E-01	7.77E-02	G
		801.84	6.154E-02	%	6.575E-01	1.86E-01	G
CS-137	1.0332E-01						
		661.62	1.033E-01	(	7.526E-02	3.10E-02	G
CE-139	-9.0631E-03						
		165.85	-9.063E-03	%(P	7.036E-02	2.10E-02	G
EU-152	-5.0779E-02						
		121.78	-5.078E-02	%(	1.787E-01	5.37E-02	G K
		344.30	2.083E-02	%	1.624E-01	4.75E-02	G
		1408.08	3.614E-02	%	2.580E-01	7.05E-02	G
		964.00	5.840E-03	&	6.373E-01	1.82E-01	G
		1112.07	-8.459E-02	%	5.470E-01	1.56E-01	G
		778.90	-1.186E-02	%	2.844E-01	7.63E-02	G
EU-154	4.2140E-02						
		123.10	4.214E-02	&(	1.256E-01	3.78E-02	G K
		1274.80	-2.504E-02	%	2.250E-01	6.35E-02	G
		723.30	-8.900E-02	&	3.536E-01	1.04E-01	G
		1004.80	-4.854E-02	%	4.417E-01	1.26E-01	G

Yankee Chemistry Spectrum name: 101F_5JAN2005_1905.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	6.5926E-02						
		86.45	6.593E-02	%(	2.124E-01	6.40E-02	G K
		105.31	6.251E-02	%	2.337E-01	7.02E-02	G
HG-203	-1.0243E-02						
		279.17	-1.024E-02	%(P	8.137E-02	2.36E-02	G K
		72.87	-5.017E-01	%	1.958E+00	5.89E-01	G
		70.83	0.000E+00	&	4.262E+00	1.27E+00	G
		82.50	3.782E-01	%	3.706E+00	1.11E+00	G
TL-208	3.2758E-01						
		583.14	3.276E-01	@(	5.508E-02	2.88E-02	G
		510.72	5.568E-01	+	2.262E-01	9.66E-02	G
PB-212	7.2180E-01						
		238.63	7.218E-01	(	1.200E-01	4.70E-02	G K
							Energy duplication
		77.11	8.848E-01	+	4.134E-01	1.33E-01	G
		74.81	9.804E-01	+	8.453E-01	2.63E-01	G
PB-214	7.2453E-01						
		351.99	7.245E-01	(	9.758E-02	4.87E-02	G K
		295.22	5.878E-01	-	2.246E-01	7.98E-02	G
							Energy duplication
		77.11	1.447E+00	+	6.761E-01	2.18E-01	G
		241.92	3.146E-02	&	8.883E-01	2.64E-01	G
BI-212	5.9002E-01						
		727.17	5.900E-01	(	4.509E-01	1.64E-01	G K
		1620.56	0.000E+00	%	1.926E+00	4.85E-01	G
		785.42	6.142E-01	%	2.869E+00	8.31E-01	G
BI-214	8.6896E-01						
		609.32	8.800E-01	(	1.127E-01	6.53E-02	G K
		1764.51	8.371E-01	(	1.667E-01	1.38E-01	G
		1120.28	1.320E+00	+	6.098E-01	2.99E-01	G
RA-224	1.2425E+00						
		241.00	1.242E+00	(	1.395E+00	4.33E-01	G
RA-226	1.7446E+00						
		185.99	1.745E+00	@(	1.442E+00	4.55E-01	G
AC-228	9.9523E-01						
		911.07	1.009E+00	(	2.189E-01	1.15E-01	G K
		968.90	8.823E-01	(	3.973E-01	1.76E-01	G
		338.40	1.126E+00	*(	4.212E-01	1.75E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-1.2122E-01						
		236.00	-1.212E-01	&(	5.030E-01	1.51E-01	G K
		256.25	4.606E-02	%	5.991E-01	1.76E-01	G
PA-234	1.0730E-02						
		98.44	1.073E-02	%(	2.137E-01	6.36E-02	G K
		946.00	0.000E+00	%	3.177E-01	8.79E-02	G
		131.28	-2.293E-02	&	2.666E-01	7.95E-02	G
		94.67	-4.148E-02	%	3.906E-01	1.17E-01	G
		883.24	2.028E-02	%	4.125E-01	1.13E-01	G
		926.70	-8.388E-02	%	5.282E-01	1.50E-01	G
		569.26	3.335E-02	%	4.006E-01	1.13E-01	G
TH-234	2.0813E+00						
		63.29	1.769E+00	%(	2.430E+00	7.45E-01	G K
		92.80	2.102E+00	(	1.972E+00	6.13E-01	G
		92.38	2.531E+00	(	2.326E+00	7.23E-01	G
AM-241	-7.4605E-04						
		59.54	-7.461E-04	&(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	-3.8510E-03	-5.1346E-03	5.1173E-01	5.1173E-01	4.501E-01
K-40		1.5854E+01	1.5854E+01	2.1780E+00	2.3550E+00	
MN-54	#A	1.3127E-02	1.3789E-02	5.7296E-02	5.7301E-02	6.270E-02
CO-57	#B	-1.2615E-04	-1.3353E-04	8.6839E-02	8.6839E-02	6.225E-02
CO-60	#B	1.7631E-02	1.7773E-02	5.6362E-02	5.6371E-02	6.913E-02
Sr-85	#A	-3.1679E-02	-4.0148E-02	8.0236E-02	8.0268E-02	6.976E-02
Kr-85	#A	-7.3135E+02	-7.3147E+02	1.4618E+03	1.4624E+03	1.610E+03
Y-88	#B	-4.4703E-03	-5.1631E-03	6.9687E-02	6.9688E-02	5.288E-02
NB-94	#B	9.5356E-04	9.5357E-04	3.7530E-02	3.7530E-02	4.621E-02
Ag-108M	#B	-1.8981E-02	-1.8987E-02	6.8195E-02	6.8203E-02	7.724E-02
CD-109	#A	-1.5588E-01	-1.6126E-01	1.6730E+00	1.6730E+00	1.804E+00
SN-113	#B	1.7929E-02	2.0489E-02	6.9183E-02	6.9193E-02	6.843E-02
SB-125	#B	1.1672E-01	1.1851E-01	1.4796E-01	1.4811E-01	1.618E-01
I-131	#B	0.0000E+00	0.0000E+00	3.4732E-01	3.4732E-01	5.928E-02
CS-134	#B	2.7482E-02	2.8048E-02	2.7922E-02	2.7967E-02	1.616E-01
CS-137		1.0317E-01	1.0332E-01	9.2993E-02	9.3176E-02	
CE-139	#A	-8.1051E-03	-9.0631E-03	6.4143E-02	6.4145E-02	6.293E-02
EU-152	#B	-5.0611E-02	-5.0779E-02	1.6122E-01	1.6124E-01	1.781E-01
EU-154	#B	4.1932E-02	4.2140E-02	1.1353E-01	1.1356E-01	1.250E-01
EU-155	#B	6.5370E-02	6.5926E-02	1.9210E-01	1.9213E-01	2.106E-01
HG-203	#B	-7.3662E-03	-1.0243E-02	2.4983E-01	2.4983E-01	5.851E-02
TL-208	#	3.2758E-01	3.2758E-01	8.6483E-02	8.8442E-02	
PB-212	#	7.2180E-01	7.2180E-01	1.4098E-01	1.4676E-01	1.200E-01
PB-214	#	7.2453E-01	7.2453E-01	1.4606E-01	1.5169E-01	9.758E-02
BI-212		5.9002E-01	5.9002E-01	4.9367E-01	4.9480E-01	
BI-214		8.6896E-01	8.6896E-01	1.9359E-01	1.9972E-01	
RA-224	A	1.2425E+00	1.2425E+00	1.2991E+00	1.3010E+00	
RA-226	#	1.7446E+00	1.7446E+00	1.3636E+00	1.3671E+00	1.442E+00
AC-228		9.9523E-01	9.9523E-01	2.7594E-01	2.8161E-01	
TH-227	#B	-1.2122E-01	-1.2122E-01	4.5157E-01	4.5162E-01	5.030E-01
PA-234	#B	1.0730E-02	1.0730E-02	1.9067E-01	1.9067E-01	2.137E-01
TH-234	#B	2.0813E+00	2.0813E+00	1.2205E+00	1.2260E+00	2.430E+00
AM-241	#A	-7.4598E-04	-7.4605E-04	1.6985E-01	1.6985E-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_5JAN2005_1905.An1

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

Total Activity (269.6 to 1999.1 keV) 1.9981697E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 1.9981838E+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_5JAN2005_1945.An1

Sample description
Detector 101 FSS-OOL-14-01-003-F SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_5JAN2005_1945.An1

Acquisition information

Start time:	05-Jan-2005 19:35:43
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:	1.6980E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.6980E+03) = 5.8893E+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_5JAN2005_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	14-Dec-2004 14:40:00
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. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1867

***** 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
62.26	94.	40.60	1.26	1.051E-02				
62.26	94.	40.60	1.26	1.051E-02	63.29	3.900	1.721E+00	TH234
74.40	178.	17.32	1.00	1.657E-02	74.81	9.600	8.939E-01	PB212
77.36	319.	10.23	1.01	1.740E-02	77.11	17.500	8.437E-01	PB212
					77.11	10.700	1.380E+00	PB214
84.32	74.	35.52	0.89	1.875E-02				
86.99	115.	37.81	1.50	1.910E-02	86.45	32.740	PBC<MDA	EU155
93.00	117.	35.47	1.50	1.989E-02	92.38	2.570	1.820E+00	TH234
					92.80	3.000	1.556E+00	TH234
186.12	126.	28.47	0.84	1.858E-02	185.99	3.280	1.652E+00	RA226
209.35	56.	37.11	1.43	1.721E-02				
238.66	685.	4.43	1.12	1.557E-02	238.63	43.100	8.123E-01	PB212
241.50	112.	19.08	1.12	1.542E-02	241.00	3.900	1.484E+00	RA224
269.90	73.	38.49	1.13	1.402E-02				
295.23	144.	12.68	1.11	1.292E-02	295.22	19.200	4.623E-01	PB214
300.66	62.	38.90	1.47	1.270E-02				
327.60	56.	34.05	0.98	1.171E-02				
338.22	195.	13.95	1.19	1.136E-02	338.40	12.010	1.136E+00	AC228
351.84	286.	8.79	1.15	1.093E-02				
351.84	286.	8.79	1.15	1.093E-02	351.99	37.100	5.622E-01	PB214
510.73	100.	21.88	1.52	7.590E-03	510.72	22.500	4.641E-01	TL208
583.01	216.	9.79	1.37	6.686E-03				
583.01	216.	9.79	1.37	6.686E-03	583.14	86.000	2.996E-01	TL208
609.01	200.	9.49	1.36	6.416E-03	609.32	46.090	5.396E-01	BI214
661.63	44.	22.03	1.57	5.937E-03	661.62	84.620	6.979E-02	CS137
726.94	64.	30.31	1.09	5.444E-03	727.17	11.800	7.992E-01	BI212

910.85	130.	11.81	1.29	4.447E-03	911.07	29.000	8.023E-01	AC228
968.66	109.	14.42	1.57	4.213E-03	964.00	14.580	1.414E+00	EU152
					968.90	17.460	1.182E+00	AC228
1120.02	52.	28.42	1.41	3.712E-03	1120.28	15.040	7.344E-01	BI214
1460.34	665.	3.99	1.76	2.943E-03	1460.75	10.700	1.682E+01	K40
1763.62	40.	15.81	0.82	2.481E-03	1764.51	15.920	8.059E-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	
124.07	62.26	573.	94.	0.047	121.79	1.260	PA-234	l
148.37	74.91	388.	178.	0.089	51.95	1.005	PB-214	D
154.28	77.86	374.	319.	0.160	30.70	1.007	PB-214	D
418.37	209.35	197.	56.	0.028	111.34	1.427	AC-228	s
477.02	238.67	117.	685.	0.343	13.28	1.122	PB-212	D
482.71	241.51	174.	112.	0.056	57.24	1.124	PB-214	D
539.52	269.90	247.	73.	0.036	115.46	1.129	AC-228	s
601.08	300.66	194.	62.	0.031	116.70	1.466	PB-212	s
654.98	327.60	123.	56.	0.028	102.14	0.983	AC-228	
1021.41	510.73	158.	52.	0.026	110.78	1.522	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	148.82	74.63	1012.	155.	0.078	90.24	1.499
PB-212	153.79	77.11	946.	291.	0.146	48.13	1.499D
PB-214	153.79	77.11	946.	291.	0.146	48.13	1.499D
EU-155	173.57	86.99	888.	115.	0.058	113.44	1.499
TH-234	185.63	93.02	814.	116.	0.058	107.99	1.499s
TH-234	185.57	93.00	798.	117.	0.058	106.41	1.499s
PA-234	181.59	91.00	685.	-187.	-0.094	63.25	1.499s
RA-226	371.82	186.08	437.	81.	0.041	114.17	1.499
PB-212	476.91	238.60	349.	522.	0.261	20.07	1.499
RA-224	483.08	241.69	399.	105.	0.052	86.14	1.499
PB-214	590.19	295.22	190.	131.	0.065	51.84	1.499D
AC-228	676.22	338.22	169.	195.	0.097	41.84	1.191
PB-214	703.55	351.88	96.	264.	0.132	24.30	1.499
TL-208	1021.40	510.73	110.	61.	0.030	82.50	1.499s
TL-208	1166.01	583.00	61.	189.	0.094	27.98	1.499
BI-214	1218.05	609.01	58.	200.	0.100	28.47	1.360
CS-137	1323.34	661.63	25.	44.	0.022	66.10	1.571
BI-212	1454.04	726.94	78.	64.	0.032	90.94	1.085s
AC-228	1822.06	910.85	33.	130.	0.065	35.42	1.289
AC-228	1937.73	968.66	41.	109.	0.055	43.26	1.569

Yankee Chemistry Spectrum name: 101F_5JAN2005_1945.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	2241.09	1120.25	49.	37.	0.019	94.23	1.713
K-40	2921.69	1460.34	10.	665.	0.333	11.98	1.762
BI-214	3528.68	1763.62	0.	40.	0.020	47.43	0.824s

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		-1.4749E-01					
			477.56	-1.475E-01	&(	6.531E-01 1.93E-01 G	
K-40		1.6820E+01					
			1460.75	1.682E+01	(	4.335E-01 6.71E-01 G	
MN-54		1.4259E-02					
			834.81	1.426E-02	&(	5.965E-02 1.74E-02 G	
CO-57		-5.1298E-03					
			122.07	-5.130E-03	&(P	5.425E-02 1.61E-02 G K	
			136.43	9.713E-02	&	4.498E-01 1.35E-01 G	
CO-60		-8.3188E-03					
			1332.51	-8.319E-03	&(P	6.631E-02 1.63E-02 G K	
			1173.23	1.543E-02	% P	8.270E-02 2.32E-02 G K	
Sr-85		-1.7960E-02					
			514.00	-1.796E-02	%(	7.741E-02 2.29E-02 G	
Kr-85		-3.2745E+02					
			513.99	-3.275E+02	%(	1.410E+03 4.17E+02 G	
Y-88		-1.3667E-03					
			1836.01	-1.367E-03	%(P	5.705E-02 1.39E-02 G K	
			898.02	-1.027E-02	& P	7.458E-02 2.11E-02 G	
NB-94		7.0425E-03					
			871.10	7.042E-03	&(	4.723E-02 1.34E-02 G K	
			702.50	-5.623E-03	%	5.089E-02 1.46E-02 G K	
Ag-108M		1.7555E-02					
			722.95	1.756E-02	%(	5.651E-02 1.67E-02 G K	
			614.37	-4.642E-03	%	4.577E-02 1.30E-02 G	
			433.93	3.636E-03	&	4.847E-02 1.40E-02 G	

Yankee Chemistry Spectrum name: 101F_5JAN2005_1945.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	-4.4243E-02						
		88.04	-4.424E-02	&(	1.730E+00	5.16E-01	G
SN-113	-1.5691E-02						
		391.71	-1.569E-02	%(P	8.135E-02	2.38E-02	G K
		255.04	-1.544E-01	%	2.370E+00	6.98E-01	G
SB-125	1.5579E-02						
		427.95	1.558E-02	%(	1.154E-01	3.32E-02	G K
		600.77	-6.733E-03	%	2.644E-01	7.50E-02	G
		636.15	1.127E-01	&	4.519E-01	1.33E-01	G
		463.51	3.093E-02	%	5.587E-01	1.63E-01	G
		176.29	-3.087E-02	&	6.663E-01	1.97E-01	G
I-131	5.0212E-02						
		364.48	5.021E-02	%(	3.191E-01	9.34E-02	G K
		636.97	0.000E+00	&	4.808E+00	1.36E+00	G
		284.29	7.924E-01	&	4.326E+00	1.28E+00	G
CS-134	2.3244E-02						
		604.66	2.324E-02	%(	3.231E-02	1.03E-02	G K
		795.76	-5.110E-03	&	7.218E-02	2.06E-02	G
		569.29	1.239E-01	%	2.727E-01	8.24E-02	G
		801.84	2.918E-01	&	6.045E-01	1.84E-01	G
CS-137	6.9794E-02						
		661.62	6.979E-02	(	4.126E-02	1.54E-02	G
CE-139	1.3956E-02						
		165.85	1.396E-02	&(P	5.620E-02	1.68E-02	G
EU-152	-1.7670E-02						
		121.78	-1.767E-02	&(	1.562E-01	4.66E-02	G K
		344.30	-7.396E-03	%	1.490E-01	4.33E-02	G
		1408.08	3.339E-02	%	2.088E-01	5.69E-02	G
		964.00	1.168E-01	&	5.763E-01	1.69E-01	G
		1112.07	8.323E-02	%	4.856E-01	1.39E-01	G
		778.90	2.635E-02	%	3.285E-01	9.16E-02	G
EU-154	2.8638E-02						
		123.10	2.864E-02	&(	1.041E-01	3.12E-02	G K
		1274.80	-3.678E-02	%	2.145E-01	6.16E-02	G
		723.30	-7.901E-03	%	4.854E-01	1.41E-01	G
		1004.80	-4.624E-02	&	3.640E-01	1.04E-01	G

Yankee Chemistry Spectrum name: 101F_5JAN2005_1945.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.4765E-01						
		86.45	1.476E-01	(	1.818E-01	5.58E-02	G K
		105.31	3.507E-02	%	2.098E-01	6.27E-02	G
HG-203	2.0174E-02						
		279.17	2.017E-02	&(P	6.422E-02	1.91E-02	G K
		72.87	-6.744E-01	%	1.788E+00	5.41E-01	G
		70.83	-1.725E+00	%	3.309E+00	1.01E+00	G
		82.50	-1.674E+00	%	3.991E+00	1.21E+00	G
TL-208	2.6625E-01						
		583.14	2.615E-01	(	5.404E-02	2.44E-02	G
		510.72	2.842E-01	*(	2.406E-01	7.82E-02	G
PB-212	6.1912E-01						
		238.63	6.191E-01	(	1.064E-01	4.14E-02	G K
							Energy duplication
		77.11	7.700E-01	+	3.861E-01	1.24E-01	G
		74.81	7.777E-01	&	7.565E-01	2.34E-01	G
PB-214	5.1793E-01						
		351.99	5.179E-01	(	9.515E-02	4.20E-02	G K
							Energy duplication
		295.22	4.196E-01	-	2.148E-01	7.25E-02	G
							Energy duplication
		77.11	1.259E+00	+	6.314E-01	2.02E-01	G
		241.92	1.002E-01	%	5.260E-01	1.56E-01	G
BI-212	7.9924E-01						
		727.17	7.992E-01	@(	5.419E-01	2.42E-01	G K
		1620.56	0.000E+00	%	7.953E-01	1.08E-01	G
		785.42	6.753E-01	%	2.527E+00	7.39E-01	G
BI-214	5.3716E-01						
		609.32	5.396E-01	(	1.025E-01	5.12E-02	G K
		1764.51	8.059E-01	+	1.485E-01	1.27E-01	G
		1120.28	5.296E-01	?(	5.061E-01	1.66E-01	G
RA-224	1.3827E+00						
		241.00	1.383E+00	(	1.266E+00	3.97E-01	G
RA-226	1.0602E+00						
		185.99	1.060E+00	(	1.307E+00	4.03E-01	G
AC-228	8.0234E-01						
		911.07	8.023E-01	(	1.819E-01	9.47E-02	G K
		968.90	1.182E+00	+	3.514E-01	1.70E-01	G
		338.40	1.136E+00	+	3.699E-01	1.58E-01	G

Yankee Chemistry Spectrum name: 101F_5JAN2005_1945.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-2.2106E-01						
		236.00	-2.211E-01	%(	5.072E-01	1.53E-01	G K
		256.25	-5.054E-02	%	6.198E-01	1.83E-01	G
PA-234	-2.9444E-04						
		98.44	-2.944E-04	%(	2.028E-01	6.03E-02	G K
		946.00	8.529E-03	%	2.502E-01	6.89E-02	G
		131.28	3.587E-03	&	2.123E-01	6.29E-02	G
		94.67	-4.787E-01	+	3.188E-01	1.01E-01	G
		883.24	-1.020E-01	&	4.547E-01	1.32E-01	G
		926.70	-1.181E-01	%	5.781E-01	1.68E-01	G
		569.26	1.801E-01	%	3.964E-01	1.20E-01	G
TH-234	1.6205E+00						
		63.29	1.546E+00	%(	2.309E+00	7.06E-01	G K
		92.80	1.556E+00	(	1.791E+00	5.52E-01	G
		92.38	1.809E+00	&(	2.116E+00	6.51E-01	G
AM-241	3.1236E-02						
		59.54	3.124E-02	%(P	3.258E-01	9.72E-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	-1.1056E-01	-1.4749E-01	5.7805E-01	5.7811E-01	4.896E-01
K-40		1.6820E+01	1.6820E+01	2.0145E+00	2.2274E+00	
MN-54	#A	1.3573E-02	1.4259E-02	5.2194E-02	5.2201E-02	5.678E-02
CO-57	#B	-4.8455E-03	-5.1298E-03	6.1550E-02	6.1551E-02	5.124E-02
CO-60	#B	-8.2525E-03	-8.3188E-03	1.5064E-01	1.5064E-01	6.579E-02
Sr-85	#A	-1.4165E-02	-1.7960E-02	6.8754E-02	6.8761E-02	6.105E-02
Kr-85	#A	-3.2740E+02	-3.2745E+02	1.2521E+03	1.2522E+03	1.409E+03
Y-88	#B	-1.1830E-03	-1.3667E-03	2.3524E-01	2.3524E-01	4.938E-02
NB-94	#B	7.0424E-03	7.0425E-03	4.0138E-02	4.0140E-02	4.723E-02
Ag-108M	#B	1.7549E-02	1.7555E-02	5.0086E-02	5.0096E-02	5.649E-02
CD-109	#A	-4.2766E-02	-4.4243E-02	1.5489E+00	1.5489E+00	1.672E+00
SN-113	#B	-1.3727E-02	-1.5691E-02	8.9169E-02	8.9174E-02	7.117E-02
SB-125	#B	1.5344E-02	1.5579E-02	9.9729E-02	9.9733E-02	1.136E-01
I-131	#B	7.4030E-03	5.0212E-02	2.8009E-01	2.8011E-01	4.704E-02
CS-134	#B	2.2774E-02	2.3244E-02	3.0953E-02	3.0980E-02	3.166E-02
CS-137		6.9696E-02	6.9794E-02	4.6137E-02	4.6305E-02	
CE-139	#A	1.2478E-02	1.3956E-02	5.0481E-02	5.0487E-02	5.025E-02
EU-152	#B	-1.7612E-02	-1.7670E-02	1.3980E-01	1.3980E-01	1.557E-01
EU-154	#B	2.8496E-02	2.8638E-02	9.3724E-02	9.3737E-02	1.035E-01
EU-155	#A	1.4640E-01	1.4765E-01	1.6749E-01	1.6769E-01	1.802E-01
HG-203	#B	1.4498E-02	2.0174E-02	5.7197E-02	5.7208E-02	4.615E-02
TL-208	#	2.6625E-01	2.6625E-01	7.4491E-02	7.5995E-02	5.404E-02
PB-212	#	6.1912E-01	6.1912E-01	1.2425E-01	1.2908E-01	1.064E-01
PB-214	#	5.1793E-01	5.1793E-01	1.2586E-01	1.2922E-01	9.515E-02
BI-212	#	7.9924E-01	7.9924E-01	7.2679E-01	7.2819E-01	
BI-214		5.3716E-01	5.3716E-01	1.5293E-01	1.5591E-01	
RA-224	#	1.3827E+00	1.3827E+00	1.1911E+00	1.1936E+00	1.266E+00
RA-226	#A	1.0601E+00	1.0602E+00	1.2104E+00	1.2119E+00	1.307E+00
AC-228		8.0234E-01	8.0234E-01	2.8420E-01	2.8779E-01	
TH-227	#B	-2.2106E-01	-2.2106E-01	4.6046E-01	4.6063E-01	5.072E-01
PA-234	#B	-2.9444E-04	-2.9444E-04	1.8085E-01	1.8085E-01	2.028E-01
TH-234	#B	1.6205E+00	1.6205E+00	1.1039E+00	1.1075E+00	2.309E+00
AM-241	#A	3.1233E-02	3.1236E-02	2.9153E-01	2.9153E-01	3.258E-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_5JAN2005_1945.An1

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

Total Activity (269.6 to 1999.1 keV) 1.9028154E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 1.9028252E+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_10JAN2005_1615.An1

Sample description
Detector 101 FSS-OOL-14-01-015-F SOIL

Spectrum Filename: C:\GammaVision\Spectra\101F_10JAN2005_1615.An1

Acquisition information
Start time: 10-Jan-2005 16:10:53
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: 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: 1.0490E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.0490E+03) =
9.5329E+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_10JAN2005_1615.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	14-Dec-2004 10:25:00
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: 0.1533

********** 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	87.15	148.	80.	0.040	72.31	1.014	PB-214	D
179.68	89.91	119.	88.	0.044	61.30	1.016	PB-214	D
363.62	181.90	63.	31.	0.015	121.61	1.081	MO-99	D
540.77	270.52	55.	84.	0.042	75.04	1.186	AC-228	s
600.40	300.32	36.	34.	0.017	93.92	1.144	PB-212	
816.73	408.44	36.	45.	0.023	82.46	1.760	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	79.	31.	0.015	132.77	0.994D
TH-234	126.14	63.29	128.	54.	0.027	97.44	0.997D
TA-182	135.00	67.72	69.	9.	0.004	449.07	0.500s
HG-203	145.31	72.87	176.	40.	0.020	146.97	1.003D
PB-212	149.19	74.81	210.	161.	0.081	44.76	1.005D
BI-207	149.51	74.97	240.	0.	0.000	0.00	0.000D
PB-214	153.79	77.11	213.	278.	0.139	28.61	1.006D
PB-212	153.79	77.11	352.	0.	0.000	373.98	0.000D
CE-144	159.81	80.12	102.	0.	0.000	0.00	0.412D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-155	172.48	86.45	187.	0.	0.000	0.00	1.013D
NP-237	172.56	86.49	143.	44.	0.022	122.48	1.013D
CD-109	175.66	88.04	222.	25.	0.012	260.19	1.014D
TH-234	184.34	92.38	262.	0.	0.000	0.00	1.018D
TH-234	185.18	92.80	126.	131.	0.065	44.98	1.018D
NP-237	191.32	95.87	128.	11.	0.005	449.96	1.020D
Cm-243	198.69	99.55	129.	25.	0.013	200.99	1.023D
Cm-243	207.11	103.76	137.	7.	0.003	725.81	1.026D
EU-155	210.21	105.31	121.	22.	0.011	220.39	1.027D
TE-132	222.78	111.59	58.	15.	0.007	274.95	0.600s
TE-132	232.20	116.30	96.	0.	0.000	12280.19	1.035D
Cm-243	233.60	117.00	109.	3.	0.001	1621.07	1.035D
EU-152	243.16	121.78	128.	2.	0.001	2595.57	1.039D
CO-57	243.74	122.07	131.	0.	0.000	0.00	1.039D
EU-154	245.80	123.10	102.	27.	0.013	170.76	1.040D
CE-144	266.67	133.53	135.	19.	0.010	264.89	1.047D
CO-57	272.48	136.43	128.	31.	0.015	164.62	1.049D
U-235	287.14	143.76	89.	21.	0.010	201.59	1.054D
CE-141	290.52	145.45	135.	34.	0.017	153.53	1.056D
TE-131	299.07	149.72	108.	33.	0.017	142.97	1.059D
U-235	326.34	163.35	91.	39.	0.019	115.69	1.068D
CE-139	331.34	165.85	98.	26.	0.013	172.18	1.070D
SB-125	349.94	175.15	89.	17.	0.009	250.48	1.329s
U-235	371.10	185.72	188.	209.	0.104	5.09	1.084A
RA-226	371.64	185.99	144.	0.	0.000	5091.17	2.142A
U-235	410.27	205.30	48.	20.	0.010	199.99	1.064
TE-132	456.41	228.36	34.	13.	0.007	247.47	0.890
TH-227	471.70	236.00	47.	39.	0.020	87.86	1.120D
PB-212	476.96	238.63	42.	467.	0.233	15.09	1.122D
RA-224	481.70	241.00	89.	41.	0.021	108.01	1.509A
PB-214	483.54	241.92	90.	69.	0.034	10.02	1.124A
SN-113	507.44	253.87	45.	45.	0.023	114.02	2.634s
TH-227	511.47	255.88	56.	0.	0.000	0.00	1.134
Cm-243	554.93	277.60	59.	33.	0.017	110.63	1.149D
HG-203	558.07	279.17	85.	5.	0.003	374.71	1.150D
J-131	566.89	283.58	50.	24.	0.012	219.54	0.695s
PB-214	589.86	295.06	82.	162.	0.081	38.14	1.167
CR-51	638.46	319.35	41.	11.	0.005	291.08	0.870
AC-228	676.15	338.18	52.	74.	0.037	57.76	0.993
EU-152	687.00	343.61	15.	4.	0.002	442.29	0.000s
PB-214	703.48	351.84	62.	230.	0.115	25.88	1.243
J-131	730.00	365.10	7.	0.	0.000	0.00	0.000s
SN-113	783.50	391.83	49.	14.	0.007	239.93	0.438s
SB-125	853.84	426.99	24.	19.	0.009	136.74	1.395
Ag-108M	866.86	433.49	15.	5.	0.002	354.96	0.520s
TE-131	904.68	452.40	16.	10.	0.005	194.42	0.731s
SB-125	926.64	463.37	33.	34.	0.017	104.57	1.562s
TE-131	985.00	492.54	6.	0.	0.000	0.00	0.000s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TL-208	1021.38	510.72	35.	55.	0.028	60.76	1.311D
Kr-85	1027.92	513.99	39.	9.	0.005	302.33	1.313D
CS-134	1139.55	569.78	9.	0.	0.000	0.00	1.351
BI-207	1139.00	569.50	8.	2.	0.001	781.02	0.000s
TL-208	1165.88	582.94	28.	117.	0.058	36.86	0.892
SB-125	1201.57	600.77	6.	0.	0.000	0.00	0.000D
CS-134	1209.35	604.66	11.	8.	0.004	200.91	1.374D
BI-214	1218.68	609.32	12.	193.	0.096	22.91	1.378D
Ag-108M	1228.78	614.37	29.	5.	0.003	432.69	1.381D
SB-125	1272.36	636.15	4.	0.	0.000	0.00	0.500D
J-131	1274.00	636.97	3.	0.	0.000	0.00	0.250D
AG-110M	1315.58	657.75	14.	1.	0.000	2751.47	1.410D
CS-137	1323.33	661.62	16.	46.	0.023	57.99	1.413D
NB-94	1404.73	702.30	20.	13.	0.007	187.95	0.716s
Ag-108M	1446.05	722.95	8.	3.	0.002	433.39	1.454D
EU-154	1446.75	723.30	15.	0.	0.000	0.00	1.454D
BI-212	1454.49	727.17	15.	27.	0.013	85.03	1.457D
EU-152	1557.54	778.67	6.	0.	0.000	887.41	0.617s
BI-212	1572.83	786.31	12.	10.	0.005	186.90	0.790s
CS-134	1591.75	795.76	25.	0.	0.000	0.00	1.502
CS-134	1603.92	801.85	8.	6.	0.003	231.92	1.209
CO-58	1620.75	810.25	7.	1.	0.001	828.40	0.481s
MN-54	1671.07	835.40	7.	15.	0.007	121.78	2.444s
MN-56	1691.22	845.47	7.	3.	0.002	412.31	0.904s
NB-94	1743.81	871.75	8.	10.	0.005	188.81	0.528s
AG-110M	1768.14	883.91	2.	0.	0.000	618.47	0.300s
Y-88	1795.83	897.75	8.	18.	0.009	108.48	0.654s
AC-228	1821.74	910.69	10.	69.	0.034	44.34	1.299s
AG-110M	1875.00	937.31	3.	0.	0.000	0.00	0.250s
EU-152	1928.41	964.00	16.	21.	0.011	103.95	1.612D
AC-228	1938.21	968.90	10.	54.	0.027	47.99	1.616D
EU-154	2007.00	1003.27	9.	3.	0.002	458.26	0.404s
BI-207	2127.68	1063.58	10.	20.	0.010	111.24	0.888s
FE-59	2199.50	1099.47	2.	0.	0.000	0.00	0.583s
EU-152	2224.72	1112.07	9.	0.	0.000	0.00	1.708D
ZN-65	2231.62	1115.52	13.	10.	0.005	172.30	1.710D
BI-214	2241.15	1120.28	8.	41.	0.020	55.60	1.713D
TA-182	2243.15	1121.28	52.	0.	0.000	0.00	1.713D
TE-131	2292.40	1145.89	7.	7.	0.003	235.74	0.829s
CO-60	2347.53	1173.44	16.	0.	0.000	0.00	0.458s
TA-182	2377.44	1188.39	6.	1.	0.001	994.99	0.344s
TA-182	2443.67	1221.48	6.	1.	0.001	994.99	0.394s
EU-154	2553.98	1276.60	7.	4.	0.002	325.54	0.903s
FE-59	2583.36	1291.28	3.	1.	0.001	793.73	0.350s
CO-60	2664.00	1331.58	10.	0.	0.000	0.00	0.000s
AG-110M	2768.86	1383.97	0.	10.	0.005	94.87	0.750s
EU-152	2816.00	1407.53	0.	0.	0.000	0.00	0.000s
K-40	2921.77	1460.38	3.	359.	0.180	16.07	1.640

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	3243.40	1621.08	0.	5.	0.002	134.16	0.625s
BI-214	3529.06	1763.81	0.	36.	0.018	50.00	1.624s
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		1.5416E-02	1460.75	1.542E-02	(	4.530E-04	G
CR-51		1.2247E-04	320.07	1.225E-04	&(	3.751E-04	G
MN-54		4.1255E-05	834.81	4.125E-05	(	4.312E-05	G
MN-56		0.0000E+00	846.60	0.000E+00	&	4.326E-05	G
			1811.20	0.000E+00	?	1.512E-04	G
FE-59		0.0000E+00	1099.22	0.000E+00	?	5.896E-05	G
			1291.56	0.000E+00	%	1.029E-04	G
CO-57		1.8796E-04	122.07	0.000E+00	} P	4.188E-05	G
			136.43	1.880E-04	$(	3.375E-04	G
CO-58		0.0000E+00	810.75	0.000E+00	%	4.061E-05	G
CO-60		0.0000E+00	1332.51	0.000E+00	& P	7.538E-05	G
			1173.23	0.000E+00	? P	8.157E-05	G
Cm-243		2.3565E-04	277.60	2.357E-04	(	2.719E-04	G
			117.00	0.000E+00	}	3.045E-04	G
			103.76	0.000E+00	%	1.626E-04	G
			99.55	1.160E-04	-	2.570E-04	G
ZN-65		7.4279E-05	1115.52	7.428E-05	(	1.377E-04	G
Kr-85		0.0000E+00	513.99	0.000E+00	%	1.321E+00	G
Y-88		0.0000E+00	1836.01	0.000E+00	? P	4.191E-05	G
			898.02	5.650E-05	* P	5.151E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
NB-94	2.9510E-05	871.10	2.775E-05	(	4.519E-05	G
		702.50	3.127E-05	?(	5.665E-05	G
Ag-108M	0.0000E+00	722.95	0.000E+00	}	4.333E-05	G
		614.37	0.000E+00	%	6.483E-05	G
		433.93	0.000E+00	%	3.507E-05	G
AG-110M	0.0000E+00	657.75	0.000E+00	%	4.874E-05	G
		884.67	0.000E+00	%	4.096E-05	G
		937.48	0.000E+00	?	9.794E-05	G
		1384.27	1.799E-04	?	1.326E-04	G
CD-109	4.6076E-04	88.04	4.608E-04	(	1.331E-03	G
SN-113	9.1624E-05	391.71	3.025E-05	?(P	7.552E-05	G
		255.04	1.994E-03	&(	1.505E-03	G
SB-125	2.0985E-04	427.95	9.616E-05	&(	1.293E-04	G
		600.77	0.000E+00	&	1.596E-04	G
		636.15	0.000E+00	}	2.468E-04	G
		463.51	5.562E-04	*(	4.754E-04	G
		176.29	1.942E-04	&(	5.221E-04	G
TE-131	6.7803E-05	149.72	3.169E-05	(	4.894E-05	G
		452.32	8.681E-05	?(	1.853E-04	G
		1146.96	4.995E-04	&(	1.149E-03	G
		492.66	0.000E+00	?	5.020E-04	G
TE-132	2.2714E-05	228.16	1.230E-05	?(	2.827E-05	G
		116.30	0.000E+00	}	1.585E-03	G
		111.76	5.211E-04	?(	1.327E-03	G
J-131	0.0000E+00	364.48	0.000E+00	&	2.369E-05	G
		636.97	0.000E+00	}	3.259E-04	G
		284.29	3.919E-04	&	5.919E-04	G
CS-134	3.2632E-05	604.66	1.749E-05	(	3.870E-05	G
		795.76	0.000E+00	%	8.205E-05	G
		569.29	0.000E+00	}	2.137E-04	G
		801.84	2.020E-04	(	4.807E-04	G
CS-137	1.2255E-04	661.62	1.225E-04	(	5.742E-05	G
CE-139	2.2126E-05	165.85	2.213E-05	(P	4.189E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
CE-141	4.6432E-05	145.45	4.643E-05	(	7.747E-05	G
CE-144	1.1459E-04	133.53	1.146E-04	(	3.382E-04	G
		80.12	0.000E+00	?	2.344E-03	G
EU-152	0.0000E+00	121.78	0.000E+00	}	1.212E-04	G
		344.30	0.000E+00	&	9.398E-05	G
		1408.08	0.000E+00	?	1.545E-04	G
		964.00	4.602E-04		4.676E-04	G
		1112.07	0.000E+00	!	4.429E-04	G
		778.90	0.000E+00	%	2.775E-04	G
EU-154	4.2197E-05	123.10	4.220E-05	(	7.871E-05	G
		1274.80	0.000E+00	&	1.692E-04	G
		723.30	0.000E+00	}	2.603E-04	G
		1004.80	0.000E+00	&	3.141E-04	G
EU-155	6.5900E-05	86.45	0.000E+00	}	1.436E-04	G
		105.31	6.590E-05	$(	1.608E-04	G
TA-182	0.0000E+00	67.75	0.000E+00	%	9.865E-05	G
		1121.28	0.000E+00	%	3.781E-04	G
		1221.42	0.000E+00	%	2.024E-04	G
		1189.05	0.000E+00	%	3.293E-04	G
HG-203	0.0000E+00	279.17	0.000E+00	% P	5.558E-05	G
		72.87	5.366E-04		8.563E-04	G
TL-208	2.7464E-04	583.14	2.746E-04	(	6.451E-05	G
		510.72	4.365E-04	+	2.391E-04	G
PB-212	9.3922E-04	238.63	9.392E-04	(	6.625E-05	G
		77.11	0.000E+00	}	4.049E-04	Energy duplication
		74.81	1.374E-03	}	5.971E-04	G
PB-214	8.0641E-04	351.99	7.680E-04	(	1.310E-04	G
		295.22	8.807E-04	(	2.451E-04	G
		77.11	2.042E-03	}	5.190E-04	Energy duplication
		241.92	8.064E-04	}	5.511E-04	G
BI-207	9.0409E-05	569.67	0.000E+00	}	3.122E-05	G
		1063.62	9.041E-05	@(	7.886E-05	G
		74.97	0.000E+00	}	1.581E-04	G
BI-212	7.1911E-04	727.17	5.619E-04	(	4.405E-04	G
		1620.56	9.162E-04	?(	1.350E-03	G
		785.42	1.376E-03	&(	2.480E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
BI-214	9.0747E-04	609.32	8.812E-04	(	8.593E-05	G
		1764.51	1.232E-03	+	2.521E-04	G
		1120.28	9.881E-04	(	3.886E-04	G
RA-224	9.2368E-04	241.00	9.237E-04	}(	1.789E-03	G
RA-226	0.0000E+00	185.99	0.000E+00	}	1.292E-03	G
AC-228	8.0577E-04	911.07	7.231E-04	@(	1.828E-04	G
		968.90	9.893E-04	(	3.227E-04	G
		338.40	7.386E-04	(	3.616E-04	G
TH-227	3.0196E-04	236.00	3.020E-04	(	2.652E-04	G
		256.25	0.000E+00		5.091E-04	G
TH-234	1.6776E-03	63.29	1.678E-03	(	1.715E-03	G
		92.80	2.957E-03	}	1.248E-03	G
		92.38	0.000E+00	}	2.070E-03	G
U-235	2.8064E-04	185.72	2.806E-04	}	8.966E-05	G
		143.76	1.304E-04	(	2.899E-04	G
		205.31	3.378E-04	(	5.739E-04	G
		163.35	5.591E-04	(	6.848E-04	G
NP-237	0.0000E+00	86.49	2.401E-04	}	3.151E-04	G
		95.87	0.000E+00	%	1.254E-03	G
AM-241	1.3418E-04	59.54	1.342E-04	(P	1.925E-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		1.4696E+01	1.4696E+01	2.3612E+00	2.5030E+00
CR-51	A	1.1675E-01	2.3083E-01	6.7190E-01	6.7203E-01
MN-54	A	3.9328E-02	4.1780E-02	5.0878E-02	5.0933E-02
MN-56	<	4.12E-02	>12 Halflives		
FE-59	<	5.6207E-02	8.5431E-02		
CO-57	A	1.7918E-01	1.9216E-01	3.1632E-01	3.1650E-01
CO-58	<	3.8713E-02	5.0549E-02		
CO-60	<	7.1855E-02	7.2563E-02		
Cm-243	A	2.2464E-01	2.2501E-01	2.4892E-01	2.4924E-01
ZN-65	A	7.0809E-02	7.6511E-02	1.3183E-01	1.3190E-01
Kr-85	<	1.2597E+03	1.2600E+03		
Y-88	<	3.9956E-02	4.7699E-02		
NB-94	A	2.8131E-02	2.8131E-02	3.7473E-02	3.7507E-02
Ag-108M	<	6.1806E-02	6.1831E-02		
AG-110M	<	4.6462E-02	5.0108E-02		
CD-109	A	4.3924E-01	4.5792E-01	1.1914E+00	1.1917E+00
SN-113	#C	8.7344E-02	1.0291E-01	1.1734E-01	1.1748E-01
SB-125		2.0005E-01	2.0382E-01	2.0649E-01	2.0681E-01
TE-131		6.4636E-02	>12 Halflives	7.2686E-02	7.2775E-02
TE-132	A	2.1653E-02	7.2734E+00	1.3453E+01	1.3459E+01
J-131	<	2.2584E-02	2.3644E-01		
CS-134	A	3.1108E-02	3.1897E-02	4.8937E-02	4.8970E-02
CS-137		1.1682E-01	1.1702E-01	6.7860E-02	6.8181E-02
CE-139	A	2.1092E-02	2.4197E-02	4.1889E-02	4.1911E-02
CE-141	A	4.4263E-02	7.9303E-02	1.2175E-01	1.2183E-01
CE-144	A	1.0923E-01	1.1674E-01	3.0923E-01	3.0930E-01
EU-152	<	8.9588E-02	8.9953E-02		
EU-154	A	4.0226E-02	4.0471E-02	6.9108E-02	6.9144E-02
EU-155	A	6.2822E-02	6.3480E-02	1.3990E-01	1.3995E-01
TA-182	<	9.4039E-02	1.1082E-01		
HG-203	<	5.2987E-02	7.9464E-02		
TL-208		2.6181E-01	>12 Halflives	9.6496E-02	9.7624E-02
PB-212		8.9535E-01	>12 Halflives	1.3509E-01	1.4425E-01
PB-214		7.6874E-01	>12 Halflives	1.7715E-01	1.8240E-01
BI-207	#C	8.6186E-02	8.6303E-02	9.6006E-02	9.6130E-02

BI-212		6.8552E-01	>12 Halflives	5.6048E-01	5.6182E-01
BI-214		8.6508E-01	>12 Halflives	1.9816E-01	2.0410E-01
RA-224	#	8.8054E-01	1.5319E+02	2.1094E+05	1.6568E+02
AC-228		7.6813E-01	>12 Halflives	2.2329E-01	2.2746E-01
TH-227		2.8785E-01	7.9877E-01	7.0180E-01	7.0325E-01
TH-234	A	1.5992E+00	3.5007E+00	3.4110E+00	3.4165E+00
U-235	A	2.6753E-01	2.6753E-01	2.7343E-01	2.7384E-01
NP-237	<	1.1956E+00	1.1956E+00		
AM-241	A	1.2792E-01	1.2793E-01	1.7128E-01	1.7143E-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) 1.9777760E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 1.8196806E+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_10JAN2005_1655.An1

Sample description
Detector 101 FSS-OOL-14-01-007-F SOIL

Spectrum Filename: C:\GammaVision\Spectra\101F_10JAN2005_1655.An1

Acquisition information

Start time:	10-Jan-2005 16:47:19
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:	7.9000E+02
Activity scaling factor:	1.0000E+06/(1.0000E+00* 7.9000E+02) = 1.2658E+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	14-Dec-2004 14:34:00
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: 0.1588

********** 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	
173.89	87.05	118.	72.	0.036	73.19	1.014	PB-214	D
179.40	89.80	101.	62.	0.031	77.96	1.016	PB-214	D
306.97	153.67	94.	39.	0.020	115.17	1.061	XE-138	D
418.26	209.38	47.	37.	0.018	92.88	1.101	AC-228	D
599.95	299.93	33.	21.	0.011	130.15	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	114.	9.	0.005	488.88	0.994D
TH-234	126.14	63.29	99.	37.	0.019	122.59	0.996D
TA-182	136.83	68.64	68.	12.	0.006	367.42	0.562s
HG-203	145.31	72.87	166.	4.	0.002	1249.94	1.003D
PB-212	149.19	74.81	145.	145.	0.072	43.11	1.005D
BI-207	149.51	74.97	248.	0.	0.000	0.00	0.000D
PB-214	153.79	77.11	177.	174.	0.087	39.74	1.006D
PB-212	153.79	77.11	270.	0.	0.000	0.00	0.440D
CE-144	159.81	80.12	127.	6.	0.003	864.83	1.009D
EU-155	172.48	86.45	161.	11.	0.006	492.28	1.013D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
NP-237	172.56	86.49	172.	0.	0.000	0.00	1.013D
CD-109	175.66	88.04	186.	21.	0.010	286.83	1.014D
TH-234	184.34	92.38	159.	12.	0.006	442.78	1.018D
TH-234	185.18	92.80	112.	62.	0.031	82.36	1.018D
NP-237	191.32	95.87	88.	13.	0.006	322.91	1.020D
Cm-243	198.69	99.55	85.	26.	0.013	164.40	1.023D
Cm-243	207.11	103.76	90.	27.	0.013	160.26	1.026D
EU-155	210.21	105.31	65.	31.	0.015	124.82	1.027D
TE-132	222.50	111.45	36.	0.	0.000	0.00	0.583s
TE-132	232.20	116.30	128.	0.	0.000	0.00	1.257D
Cm-243	236.87	118.63	70.	23.	0.012	239.80	1.083
EU-152	243.16	121.78	71.	14.	0.007	268.82	1.038D
CO-57	243.74	122.07	86.	0.	0.000	0.00	1.039D
EU-154	245.80	123.10	98.	10.	0.005	418.00	1.039D
CE-144	265.79	133.09	76.	64.	0.032	103.96	1.105s
CO-57	272.48	136.43	56.	0.	0.000	0.00	0.000D
U-235	287.14	143.76	94.	23.	0.011	191.46	1.054D
CE-141	290.52	145.45	83.	17.	0.008	243.33	1.055D
TE-131	299.07	149.72	93.	9.	0.004	476.24	1.058D
U-235	326.34	163.35	88.	16.	0.008	251.93	1.068D
CE-139	331.34	165.85	64.	1.	0.000	3232.55	1.070D
SB-125	352.00	176.18	32.	0.	0.000	0.00	0.000s
U-235	371.10	185.72	83.	128.	0.064	7.88	1.084A
RA-226	371.64	185.99	68.	0.	0.000	3485.69	0.968A
U-235	410.29	205.31	71.	11.	0.005	343.97	1.098D
TE-132	458.88	229.59	50.	44.	0.022	126.46	0.888s
TH-227	471.70	236.00	62.	10.	0.005	357.99	1.120D
PB-212	476.96	238.63	62.	360.	0.180	18.33	1.121D
RA-224	481.70	241.00	44.	4.	0.002	686.57	1.313A
PB-214	483.54	241.92	71.	52.	0.026	9.79	1.124A
SN-113	508.33	254.31	41.	8.	0.004	361.12	0.780
TH-227	511.66	255.97	49.	0.	0.000	0.00	1.134
Cm-243	554.93	277.60	39.	24.	0.012	124.02	1.149D
HG-203	558.07	279.17	65.	2.	0.001	480.01	1.150D
J-131	569.00	284.63	29.	8.	0.004	304.65	1.455s
PB-214	590.19	295.22	26.	103.	0.052	36.07	1.161D
CR-51	639.43	319.83	32.	18.	0.009	168.18	0.683s
AC-228	676.10	338.16	28.	68.	0.034	50.94	1.081
EU-152	689.29	344.75	23.	9.	0.005	253.55	0.818
PB-214	703.68	351.94	35.	188.	0.094	27.00	1.044
J-131	729.00	364.60	5.	0.	0.000	0.00	0.000s
SN-113	783.00	391.58	17.	0.	0.000	0.00	0.000s
SB-125	855.00	427.57	28.	8.	0.004	315.19	0.000s
Ag-108M	867.09	433.61	23.	3.	0.002	674.83	0.446s
TE-131	906.38	453.25	14.	10.	0.005	190.06	1.222s
SB-125	925.73	462.92	28.	28.	0.014	113.39	1.382s
TE-131	984.07	492.07	11.	9.	0.005	188.03	0.916
TL-208	1021.38	510.72	35.	46.	0.023	70.83	1.311D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Kr-85	1027.92	513.99	37.	3.	0.002	836.35	1.313D
CS-134	1140.00	570.00	5.	0.	0.000	0.00	0.000s
BI-207	1140.00	570.00	5.	0.	0.000	0.00	0.000s
TL-208	1166.09	583.04	22.	105.	0.052	36.96	1.060
SB-125	1201.57	600.77	9.	0.	0.000	0.00	1.671D
CS-134	1209.35	604.66	17.	1.	0.001	1252.25	1.374D
BI-214	1218.68	609.32	25.	114.	0.057	33.65	1.378D
Ag-108M	1228.78	614.37	18.	0.	0.000	0.00	1.381D
SB-125	1272.36	636.15	15.	0.	0.000	0.00	1.387D
J-131	1275.25	637.59	2.	1.	0.001	600.00	0.375s
AG-110M	1315.58	657.75	13.	1.	0.000	1903.07	1.410D
CS-137	1323.33	661.62	17.	57.	0.029	50.06	1.413D
NB-94	1405.33	702.60	6.	0.	0.000	960.47	0.428s
Ag-108M	1446.05	722.95	10.	1.	0.001	1317.32	1.454D
EU-154	1446.75	723.30	13.	0.	0.000	0.00	1.454D
BI-212	1454.49	727.17	16.	17.	0.008	125.97	1.457D
EU-152	1560.36	780.07	10.	4.	0.002	415.33	1.452
BI-212	1573.07	786.43	4.	19.	0.009	87.91	0.793s
CS-134	1591.75	795.76	13.	1.	0.001	1517.52	1.502D
CS-134	1603.91	801.84	11.	1.	0.001	1097.51	1.506D
CO-58	1621.82	810.79	2.	16.	0.008	90.26	0.718s
MN-54	1670.02	834.88	6.	20.	0.010	97.40	1.460s
MN-56	1692.00	845.86	2.	0.	0.000	497.49	0.143s
NB-94	1741.70	870.70	12.	12.	0.006	174.09	2.537s
AG-110M	1770.00	884.84	3.	1.	0.000	748.33	0.000s
Y-88	1791.60	895.63	4.	8.	0.004	145.04	0.805s
AC-228	1821.57	910.61	8.	75.	0.038	40.86	0.812s
AG-110M	1878.10	938.86	9.	5.	0.002	320.71	0.641s
EU-152	1928.41	964.00	16.	16.	0.008	127.71	1.612D
AC-228	1938.21	968.90	15.	44.	0.022	59.42	1.616D
EU-154	2010.73	1005.14	8.	11.	0.005	161.35	1.874s
BI-207	2128.13	1063.80	13.	16.	0.008	141.77	0.814s
FE-59	2199.00	1099.22	5.	2.	0.001	519.62	0.451s
EU-152	2224.72	1112.07	13.	4.	0.002	372.65	1.707D
ZN-65	2231.62	1115.52	15.	0.	0.000	0.00	1.709D
BI-214	2241.15	1120.28	16.	20.	0.010	111.38	1.712D
TA-182	2243.15	1121.28	9.	0.	0.000	0.00	0.637D
TE-131	2293.83	1146.60	11.	13.	0.007	156.99	0.440s
CO-60	2347.39	1173.37	15.	5.	0.003	150.00	2.128s
TA-182	2379.32	1189.33	12.	12.	0.006	174.09	0.844s
TA-182	2443.47	1221.38	7.	10.	0.005	147.72	0.508s
EU-154	2550.00	1274.61	3.	1.	0.000	748.33	0.562s
FE-59	2584.00	1291.60	0.	3.	0.002	173.21	1.499
CO-60	2664.49	1331.82	9.	11.	0.006	87.83	0.934s
AG-110M	2770.00	1384.54	0.	5.	0.002	134.16	0.500s
EU-152	2816.00	1407.53	0.	0.	0.000	0.00	0.000s
K-40	2921.97	1460.47	10.	277.	0.139	19.13	2.121
BI-212	3241.33	1620.05	1.	0.	0.000	360.56	0.394s

YAEC Chemistry Lab Spectrum name: 101F_10JAN2005_1655.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3530.23	1764.40	0.	13.	0.007	83.21	1.499
MN-56	3622.00	1810.25	0.	0.	0.000	0.00	0.000s
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		1.1889E-02	1460.75	1.189E-02	(	7.488E-04	G
CR-51		2.0093E-04	320.07	2.009E-04	(	3.314E-04	G
MN-54		5.4850E-05	834.81	5.485E-05	*(	4.104E-05	G
MN-56		0.0000E+00	846.60	0.000E+00	%	2.421E-05	G
			1811.20	0.000E+00	?	1.512E-04	G
FE-59		0.0000E+00	1099.22	0.000E+00	%	8.324E-05	G
			1291.56	2.862E-05	?	7.032E-05	G
CO-57		0.0000E+00	122.07	0.000E+00	} P	3.434E-05	G
			136.43	0.000E+00	&	2.288E-04	G
CO-58		4.3617E-05	810.75	4.362E-05	(	2.636E-05	G
CO-60		4.6717E-05	1332.51	4.672E-05	(P	7.062E-05	G
			1173.23	0.000E+00	% P	7.858E-05	G
Cm-243		1.4508E-04	277.60	1.726E-04	(	2.242E-04	G
			117.00	1.362E-04	}	2.469E-04	G
			103.76	7.648E-05	-	1.332E-04	G
			99.55	1.182E-04	(	2.115E-04	G
ZN-65		0.0000E+00	1115.52	0.000E+00	%	1.484E-04	G
Kr-85		0.0000E+00	513.99	0.000E+00	%	1.291E+00	G
Y-88		0.0000E+00	1836.01	0.000E+00	% P	4.191E-05	G
			898.02	2.511E-05	& P	3.889E-05	G
NB-94		3.6023E-05	871.10	3.602E-05	@(	5.441E-05	G
			702.50	0.000E+00	%	3.510E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	0.0000E+00	722.95	0.000E+00	}		4.705E-05	G
		614.37	0.000E+00	!		5.261E-05	G
		433.93	0.000E+00	%		4.206E-05	G
AG-110M	0.0000E+00	657.75	0.000E+00	%		4.697E-05	G
		884.67	0.000E+00	%		4.559E-05	G
		937.48	0.000E+00	&		1.539E-04	G
		1384.27	8.994E-05	?		1.326E-04	G
CD-109	3.8272E-04	88.04	3.827E-04	(		1.223E-03	G
SN-113	0.0000E+00	391.71	0.000E+00	%	P	4.635E-05	G
		255.04	0.000E+00	&		1.440E-03	G
SB-125	0.0000E+00	427.95	0.000E+00	%		1.396E-04	G
		600.77	0.000E+00	&		1.915E-04	G
		636.15	0.000E+00	}		4.067E-04	G
		463.51	4.536E-04	*		4.434E-04	G
		176.29	0.000E+00	?		3.258E-04	G
TE-131	0.0000E+00	149.72	0.000E+00	%		4.566E-05	G
		452.32	9.115E-05	&		1.722E-04	G
		1146.96	9.865E-04	?		1.352E-03	G
		492.66	3.317E-04			6.373E-04	G
TE-132	4.1620E-05	228.16	4.162E-05	&(		3.373E-05	G
		116.30	0.000E+00	}		1.819E-03	G
		111.76	0.000E+00	?		1.065E-03	G
J-131	0.0000E+00	364.48	0.000E+00	?		2.068E-05	G
		636.97	0.000E+00	}		2.811E-04	G
		284.29	0.000E+00	%		4.637E-04	G
CS-134	0.0000E+00	604.66	0.000E+00	%		4.665E-05	G
		795.76	0.000E+00	%		6.058E-05	G
		569.29	0.000E+00	}		1.636E-04	G
		801.84	0.000E+00	%		5.661E-04	G
CS-137	1.5360E-04	661.62	1.536E-04	(		5.873E-05	G
CE-139	0.0000E+00	165.85	0.000E+00	%	P	3.429E-05	G
CE-141	2.2751E-05	145.45	2.275E-05	(		6.167E-05	G
CE-144	3.7809E-04	133.53	3.781E-04	*(		2.588E-04	G
		80.12	0.000E+00	%		2.604E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-152	1.5189E-04	121.78	3.046E-05	}		9.176E-05	G
		344.30	4.185E-05	(		1.116E-04	G
		1408.08	0.000E+00	?		1.545E-04	G
		964.00	3.557E-04	(		4.647E-04	G
		1112.07	0.000E+00	%		5.133E-04	G
		778.90	0.000E+00	&		3.549E-04	G
EU-154	0.0000E+00	123.10	0.000E+00	%		7.703E-05	G
		1274.80	0.000E+00	%		1.288E-04	G
		723.30	0.000E+00	}		2.481E-04	G
		1004.80	2.070E-04	*		2.990E-04	G
EU-155	9.1016E-05	86.45	0.000E+00	}		1.336E-04	G
		105.31	9.102E-05	(		1.204E-04	G
TA-182	0.0000E+00	67.75	0.000E+00	&		9.798E-05	G
		1121.28	0.000E+00	%		1.711E-04	G
		1221.42	1.481E-04	?		2.112E-04	G
		1189.05	2.876E-04	?		4.343E-04	G
HG-203	0.0000E+00	279.17	0.000E+00	%	P	4.913E-05	G
		72.87	0.000E+00	%		8.326E-04	G
TL-208	2.4683E-04	583.14	2.468E-04	(		5.775E-05	G
		510.72	3.614E-04	+		2.406E-04	G
PB-212	7.2529E-04	238.63	7.253E-04	(		7.947E-05	G
		77.11	0.000E+00	}		3.559E-04	Energy duplication
		74.81	1.234E-03	}		4.999E-04	G
PB-214	6.0568E-04	351.99	6.274E-04	(		1.007E-04	G
		295.22	5.637E-04	(		1.434E-04	G
		77.11	1.274E-03	}		4.756E-04	Energy duplication
		241.92	6.057E-04	}		4.920E-04	G
BI-207	7.2327E-05	569.67	0.000E+00	}		2.578E-05	G
		1063.62	7.233E-05	(		8.820E-05	G
		74.97	0.000E+00	}		1.606E-04	G
BI-212	3.4932E-04	727.17	3.493E-04	(		4.492E-04	G
		1620.56	0.000E+00	%		1.350E-03	G
		785.42	2.529E-03	&		1.601E-03	G
BI-214	4.9628E-04	609.32	5.219E-04	(		1.186E-04	G
		1764.51	4.447E-04	(		2.521E-04	G
		1120.28	4.725E-04	(		5.238E-04	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
RA-224	0.0000E+00	241.00	0.000E+00	}		1.476E-03	G
RA-226	0.0000E+00	185.99	0.000E+00	}		9.089E-04	G
AC-228	7.6732E-04	911.07	7.860E-04	*(		1.665E-04	G
		968.90	8.004E-04	(		3.862E-04	G
		338.40	6.741E-04	(		2.713E-04	G
TH-227	0.0000E+00	236.00	0.000E+00	%		3.032E-04	G
		256.25	0.000E+00	%		4.786E-04	G
TH-234	1.1601E-03	63.29	1.160E-03	(		1.516E-03	G
		92.80	1.396E-03	}		1.180E-03	G
		92.38	0.000E+00	}		1.627E-03	G
U-235	1.7156E-04	185.72	1.716E-04	}		6.077E-05	G
		143.76	1.415E-04	(		2.978E-04	G
		205.31	0.000E+00	%		6.927E-04	G
		163.35	2.388E-04	(		6.709E-04	G
NP-237	0.0000E+00	86.49	0.000E+00	}		3.447E-04	G
		95.87	0.000E+00	%		1.051E-03	G
AM-241	0.0000E+00	59.54	0.000E+00	%	P	2.284E-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		1.5050E+01	1.5050E+01	2.8790E+00	3.0020E+00
CR-51	A	2.5434E-01	5.0101E-01	8.4262E-01	8.4310E-01
MN-54	#	6.9431E-02	7.3735E-02	7.1820E-02	7.1941E-02
MN-56	<	3.06E-02	>12 Halflives		
FE-59	<	1.0537E-01	1.5979E-01		
CO-57	<	2.8956E-01	3.1041E-01		
CO-58	#	5.5211E-02	7.1986E-02	6.4977E-02	6.5104E-02
CO-60	#A	5.9136E-02	5.9715E-02	8.3239E-02	8.3308E-02
Cm-243	A	1.8365E-01	1.8394E-01	1.8940E-01	1.8969E-01
ZN-65	<	1.8785E-01	2.0289E-01		
Kr-85	<	1.6347E+03	1.6351E+03		
Y-88	<	5.3056E-02	6.3276E-02		
NB-94	#A	4.5599E-02	4.5599E-02	7.9383E-02	7.9425E-02
Ag-108M	<	6.6601E-02	6.6628E-02		
AG-110M	<	5.9461E-02	6.4101E-02		
CD-109	A	4.8445E-01	5.0494E-01	1.4483E+00	1.4486E+00
SN-113	<	5.8674E-02	6.9072E-02		
SB-125	<	1.7674E-01	1.8005E-01		
TE-131	<	5.78E-02	>12 Halflives		
TE-132	#	5.2683E-02	1.7148E+01	2.1685E+01	2.1706E+01
J-131	<	2.6181E-02	2.7063E-01		
CS-134	<	5.9049E-02	6.0540E-02		
CS-137		1.9443E-01	1.9476E-01	9.7493E-02	9.8112E-02
CE-139	<	4.3401E-02	4.9752E-02		
CE-141	A	2.8799E-02	5.1434E-02	1.2516E-01	1.2519E-01
CE-144	#	4.7859E-01	5.1128E-01	5.3155E-01	5.3230E-01
EU-152	C	1.9226E-01	1.9304E-01	2.4653E-01	2.4678E-01
EU-154	<	9.7503E-02	9.8094E-02		
EU-155	A	1.1521E-01	1.1641E-01	1.4530E-01	1.4545E-01
TA-182	<	1.2402E-01	1.4602E-01		
HG-203	<	6.2188E-02	9.3060E-02		
TL-208		3.1244E-01	>12 Halflives	1.1548E-01	1.1682E-01
PB-212		9.1809E-01	>12 Halflives	1.6832E-01	1.7613E-01
PB-214		7.6668E-01	>12 Halflives	1.7273E-01	1.7808E-01
BI-207	A	9.1553E-02	9.1677E-02	1.2997E-01	1.3007E-01
BI-212	A	4.4218E-01	>12 Halflives	5.5703E-01	5.5759E-01
BI-214		6.2820E-01	>12 Halflives	2.1136E-01	2.1432E-01
AC-228		9.7130E-01	>12 Halflives	2.8585E-01	2.9107E-01
TH-227	<	3.8377E-01	1.0591E+00		

TH-234	A	1.4685E+00	3.2010E+00	3.9240E+00	3.9280E+00
U-235	A	2.1716E-01	2.1716E-01	3.4357E-01	3.4378E-01
NP-237	<	1.3307E+00	1.3307E+00		
AM-241	<	2.8911E-01	2.8914E-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) 1.9040682E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 3.8215115E+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_10JAN2005_1730.An1

Sample description
Detector 101 FSS-OOL-14-01-012-F SOIL

Spectrum Filename: C:\GammaVision\Spectra\101F_10JAN2005_1730.An1

Acquisition information

Start time:	10-Jan-2005 17:23:25
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:	1.6300E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.6300E+03) = 6.1350E+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_10JAN2005_1730.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	14-Dec-2004 14:55:00
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: 0.1536

********** 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	87.12	304.	95.	0.047	83.73	1.014	PB-214	D
179.50	89.82	263.	93.	0.046	80.68	1.016	PB-214	D
258.40	129.38	198.	61.	0.031	104.47	1.044	AC-228	D
418.06	209.16	82.	95.	0.047	50.92	1.101	AC-228	D
540.95	270.61	94.	74.	0.037	106.53	1.315	AC-228	s
600.21	300.14	71.	46.	0.023	88.51	1.165	PB-212	D
655.48	327.85	67.	47.	0.024	95.09	0.777	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	217.	13.	0.007	463.99	0.994D
TH-234	126.14	63.29	228.	49.	0.025	137.07	0.996D
TA-182	134.01	67.22	274.	78.	0.039	154.22	0.693s
HG-203	145.31	72.87	243.	66.	0.033	107.14	1.003D
PB-212	149.19	74.81	290.	218.	0.109	38.85	1.005D
BI-207	149.51	74.97	340.	0.	0.000	0.00	0.000D
PB-214	153.79	77.11	292.	362.	0.181	25.50	1.006D
PB-212	153.79	77.11	362.	0.	0.000	125.03	0.503D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CE-144	159.81	80.12	148.	0.	0.000	0.00	0.668D
EU-155	172.48	86.45	284.	47.	0.023	159.15	1.013D
NP-237	172.56	86.49	331.	0.	0.000	0.00	1.013D
CD-109	175.66	88.04	414.	0.	0.000	0.00	1.014D
TH-234	184.34	92.38	388.	0.	0.000	0.00	1.018D
TH-234	185.18	92.80	268.	124.	0.062	62.16	1.018D
NP-237	191.32	95.87	259.	7.	0.003	1033.02	1.020D
Cm-243	198.69	99.55	272.	11.	0.006	617.63	1.023D
Cm-243	207.11	103.76	268.	2.	0.001	3005.40	1.026D
EU-155	210.21	105.31	257.	27.	0.014	254.88	1.027D
TE-132	222.13	111.27	159.	31.	0.015	249.93	1.290s
TE-132	232.20	116.30	239.	0.	0.000	0.00	0.771D
Cm-243	234.71	117.56	189.	35.	0.018	255.06	0.708s
EU-152	243.16	121.78	225.	24.	0.012	271.16	1.038D
CO-57	243.74	122.07	250.	0.	0.000	0.00	1.039D
EU-154	245.80	123.10	196.	11.	0.005	554.63	1.039D
CE-144	266.67	133.53	216.	7.	0.004	856.70	1.047D
CO-57	272.48	136.43	178.	0.	0.000	0.00	1.512D
U-235	287.14	143.76	165.	48.	0.024	122.13	1.054D
CE-141	290.52	145.45	196.	31.	0.016	198.29	1.055D
TE-131	299.07	149.72	211.	30.	0.015	212.93	1.058D
U-235	326.34	163.35	92.	10.	0.005	415.92	1.068D
CE-139	331.34	165.85	149.	30.	0.015	178.63	1.070D
SB-125	354.62	177.48	119.	47.	0.023	154.05	0.725s
U-235	371.10	185.72	272.	256.	0.128	5.58	1.084A
RA-226	371.64	185.99	200.	0.	0.000	6000.00	1.279A
U-235	410.29	205.31	134.	27.	0.014	188.12	1.098D
TE-132	454.46	227.38	53.	6.	0.003	459.53	0.615s
TH-227	471.70	236.00	142.	19.	0.010	268.73	1.120D
PB-212	476.96	238.63	110.	628.	0.314	13.91	1.122D
RA-224	481.70	241.00	126.	58.	0.029	91.32	1.766A
PB-214	483.54	241.92	146.	73.	0.036	9.55	1.124A
SN-113	509.56	254.92	44.	12.	0.006	300.00	1.050
TH-227	511.43	255.86	101.	0.	0.000	0.00	1.134
Cm-243	554.93	277.60	95.	45.	0.022	102.33	1.149D
HG-203	558.07	279.17	83.	14.	0.007	211.92	1.150D
J-131	567.50	283.88	19.	0.	0.000	0.00	0.583s
PB-214	590.19	295.22	81.	151.	0.076	35.10	1.161D
CR-51	638.53	319.38	46.	5.	0.002	590.93	0.684s
AC-228	676.52	338.37	68.	102.	0.051	48.59	1.100
EU-152	684.54	342.38	74.	24.	0.012	196.05	0.396s
PB-214	703.84	352.02	90.	262.	0.131	26.41	1.130
J-131	725.73	362.96	48.	8.	0.004	410.79	1.814s
SN-113	784.33	392.25	52.	16.	0.008	201.51	0.577s
SB-125	856.60	428.37	45.	15.	0.007	225.83	0.675s
Ag-108M	869.69	434.91	22.	4.	0.002	459.51	0.770s
TE-131	907.22	453.67	40.	14.	0.007	248.30	0.555s
SB-125	925.78	462.94	35.	39.	0.020	88.49	1.479

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TE-131	983.54	491.81	32.	4.	0.002	726.05	0.617s
TL-208	1021.38	510.72	58.	68.	0.034	59.38	1.311D
Kr-85	1027.92	513.99	58.	3.	0.002	1069.74	1.313D
CS-134	1142.73	571.37	20.	5.	0.002	402.49	0.837s
BI-207	1139.22	569.61	42.	0.	0.000	0.00	1.351
TL-208	1166.13	583.06	54.	161.	0.081	34.30	1.323
SB-125	1201.57	600.77	30.	7.	0.004	330.34	1.372D
CS-134	1209.35	604.66	22.	14.	0.007	164.52	1.374D
BI-214	1218.68	609.32	18.	214.	0.107	22.18	1.378D
Ag-108M	1228.78	614.37	17.	6.	0.003	337.04	1.381D
SB-125	1270.42	635.18	17.	14.	0.007	160.47	1.339
J-131	1274.00	636.97	4.	0.	0.000	0.00	0.362D
AG-110M	1315.16	657.54	16.	0.	0.000	0.00	1.410
CS-137	1323.27	661.59	22.	44.	0.022	68.38	1.150s
NB-94	1400.33	700.10	40.	13.	0.007	285.45	0.833s
Ag-108M	1446.05	722.95	18.	2.	0.001	958.88	1.454D
EU-154	1446.75	723.30	22.	0.	0.000	0.00	1.454D
BI-212	1454.49	727.17	24.	47.	0.023	62.43	1.457D
EU-152	1557.40	778.59	10.	10.	0.005	164.75	0.592s
BI-212	1569.26	784.52	12.	6.	0.003	249.40	0.521s
CS-134	1592.00	795.89	8.	0.	0.000	0.00	0.000s
CS-134	1604.61	802.19	18.	0.	0.000	0.00	1.507
CO-58	1619.67	809.71	11.	3.	0.002	500.00	0.344s
MN-54	1670.82	835.28	26.	15.	0.007	192.87	0.919s
MN-56	1693.62	846.67	7.	2.	0.001	471.43	0.678s
NB-94	1742.89	871.29	13.	6.	0.003	282.84	0.529s
AG-110M	1771.76	885.72	10.	8.	0.004	208.06	0.590s
Y-88	1794.38	897.03	19.	4.	0.002	479.09	0.600s
AC-228	1822.35	911.00	22.	92.	0.046	39.81	1.261
AG-110M	1874.32	936.97	11.	8.	0.004	207.50	1.550
EU-152	1928.41	964.00	15.	30.	0.015	77.43	1.612D
AC-228	1938.21	968.90	22.	58.	0.029	51.96	1.616D
EU-154	2008.00	1003.77	18.	8.	0.004	273.00	0.416s
BI-207	2129.13	1064.30	30.	17.	0.009	194.92	0.528s
FE-59	2200.36	1099.90	12.	8.	0.004	208.71	1.006s
EU-152	2224.72	1112.07	12.	2.	0.001	1020.77	1.708D
ZN-65	2231.62	1115.52	27.	3.	0.002	681.69	1.710D
BI-214	2241.15	1120.28	23.	45.	0.022	64.06	1.713D
TA-182	2243.15	1121.28	54.	0.	0.000	0.00	0.378D
TE-131	2294.10	1146.74	20.	13.	0.007	197.17	0.657s
CO-60	2344.96	1172.15	23.	5.	0.002	189.47	1.564
TA-182	2377.21	1188.27	20.	28.	0.014	106.07	0.583s
TA-182	2444.00	1221.64	4.	0.	0.000	0.00	0.000s
EU-154	2550.00	1274.61	5.	0.	0.000	854.40	0.000s
FE-59	2582.64	1290.92	7.	5.	0.003	257.09	0.742s
CO-60	2665.56	1332.35	14.	20.	0.010	85.83	0.733s
AG-110M	2768.00	1383.54	2.	0.	0.000	618.47	0.154s
EU-152	2814.80	1406.93	5.	16.	0.008	113.65	0.958s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
K-40	2921.74	1460.36	7.	510.	0.255	13.69	2.010
BI-212	3243.14	1620.95	1.	1.	0.001	422.09	0.880s
BI-214	3530.18	1764.37	0.	29.	0.014	55.71	1.249s
MN-56	3624.00	1811.25	0.	0.	0.000	335.41	0.000s
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	Peak Code	Peak MDA Value microCi	Comments
K-40		2.1890E-02	1460.75	2.189E-02	(	6.455E-04	G
CR-51		0.0000E+00	320.07	0.000E+00	&	3.940E-04	G
MN-54		4.2193E-05	834.81	4.219E-05	?(	7.446E-05	G
MN-56		0.0000E+00	846.60	0.000E+00	%	4.240E-05	G
			1811.20	0.000E+00	%	1.512E-04	G
FE-59		5.1989E-05	1099.22	5.283E-05	?(	1.181E-04	G
			1291.56	5.089E-05	?(	1.407E-04	G
CO-57		0.0000E+00	122.07	0.000E+00	} P	5.706E-05	G
			136.43	0.000E+00	!	3.954E-04	G
CO-58		0.0000E+00	810.75	0.000E+00	&	5.004E-05	G
CO-60		8.2730E-05	1332.51	8.273E-05	@(P	8.659E-05	G
			1173.23	0.000E+00	& P	9.587E-05	G
Cm-243		3.1816E-04	277.60	3.182E-04	(	3.408E-04	G
			117.00	2.072E-04	}	3.954E-04	G
			103.76	0.000E+00	%	2.241E-04	G
			99.55	0.000E+00	%	3.674E-04	G
ZN-65		0.0000E+00	1115.52	0.000E+00	%	1.915E-04	G
Kr-85		0.0000E+00	513.99	0.000E+00	%	1.591E+00	G
Y-88		9.9714E-06	1836.01	9.971E-06	?(P	4.191E-05	G
			898.02	0.000E+00	& P	7.428E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
NB-94	2.4398E-05	871.10	1.752E-05	?(	5.699E-05	G
		702.50	3.127E-05	&(	7.742E-05	G
Ag-108M	0.0000E+00	722.95	0.000E+00	}	6.184E-05	G
		614.37	0.000E+00	%	5.197E-05	G
		433.93	0.000E+00	&	4.123E-05	G
AG-110M	0.0000E+00	657.75	0.000E+00		5.087E-05	G
		884.67	3.455E-05	&	7.238E-05	G
		937.48	7.570E-05	$	1.629E-04	G
		1384.27	0.000E+00	%	1.813E-04	G
CD-109	0.0000E+00	88.04	0.000E+00	!	1.800E-03	G
SN-113	3.4528E-05	391.71	3.453E-05	(P	7.763E-05	G
		255.04	0.000E+00	%	1.490E-03	G
SB-125	2.5890E-04	427.95	7.592E-05	(	1.719E-04	G
		600.77	0.000E+00	%	3.171E-04	G
		636.15	2.808E-04	}	4.258E-04	G
		463.51	6.318E-04	(	4.905E-04	G
		176.29	5.267E-04	&(	6.000E-04	G
TE-131	9.7411E-05	149.72	2.868E-05	(	6.741E-05	G
		452.32	1.186E-04	&(	2.804E-04	G
		1146.96	9.740E-04	$(	1.764E-03	G
		492.66	0.000E+00	&	1.026E-03	G
TE-132	0.0000E+00	228.16	0.000E+00	&	3.455E-05	G
		116.30	0.000E+00	}	2.454E-03	G
		111.76	1.077E-03		2.135E-03	G
J-131	0.0000E+00	364.48	0.000E+00	&	5.513E-05	G
		636.97	0.000E+00	}	3.636E-04	G
		284.29	0.000E+00	?	3.839E-04	G
CS-134	2.9978E-05	604.66	2.998E-05	(	5.310E-05	G
		795.76	0.000E+00	%	5.013E-05	G
		569.29	0.000E+00	}	3.016E-04	G
		801.84	0.000E+00	%	6.919E-04	G
CS-137	1.1924E-04	661.62	1.192E-04	(	6.563E-05	G
CE-139	2.5926E-05	165.85	2.593E-05	(P	5.102E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
CE-141	4.2405E-05	145.45	4.240E-05	(	9.259E-05	G
CE-144	0.0000E+00	133.53	0.000E+00	%	4.236E-04	G
		80.12	0.000E+00	&	2.793E-03	G
EU-152	2.9337E-04	121.78	5.263E-05	}	1.586E-04	G
		344.30	1.076E-04	&(	1.919E-04	G
		1408.08	3.284E-04	&(	2.824E-04	G
		964.00	6.574E-04	$(	4.546E-04	G
		1112.07	0.000E+00	%	5.110E-04	G
		778.90	2.136E-04	?(	3.623E-04	G
EU-154	0.0000E+00	123.10	0.000E+00	%	1.074E-04	G
		1274.80	0.000E+00	%	1.467E-04	G
		723.30	0.000E+00	}	3.081E-04	G
		1004.80	1.506E-04	&	4.231E-04	G
EU-155	8.1561E-05	86.45	1.011E-04	}	1.757E-04	G
		105.31	8.156E-05	$(	2.306E-04	G
TA-182	3.1796E-04	67.75	1.846E-04	&(	1.903E-04	G
		1121.28	0.000E+00	&	3.848E-04	G
		1221.42	0.000E+00	?	1.724E-04	G
		1189.05	6.528E-04	*(	5.491E-04	G
HG-203	7.9055E-05	279.17	1.663E-05	(P	5.518E-05	G
		72.87	8.740E-04	(	1.001E-03	G
TL-208	3.7925E-04	583.14	3.793E-04	(	8.662E-05	G
		510.72	5.416E-04	+	3.012E-04	G
PB-212	1.2642E-03	238.63	1.264E-03	(	1.038E-04	G
		77.11	0.000E+00	}	4.101E-04	Energy duplication
		74.81	1.857E-03	}	6.983E-04	G
PB-214	8.5649E-04	351.99	8.736E-04	(	1.564E-04	G
		295.22	8.235E-04	(	2.430E-04	G
		77.11	2.657E-03	}	6.046E-04	Energy duplication
		241.92	8.565E-04	}	6.928E-04	G
BI-207	7.6847E-05	569.67	0.000E+00	}	6.640E-05	G
		1063.62	7.685E-05	?(	1.276E-04	G
		74.97	0.000E+00	}	1.871E-04	G
BI-212	9.6539E-04	727.17	9.861E-04	(	5.387E-04	G
		1620.56	0.000E+00	%	1.350E-03	G
		785.42	8.431E-04	&(	2.480E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-214	1.0015E-03	609.32	9.781E-04	(	1.029E-04		G
		1764.51	9.921E-04	(	2.521E-04		G
		1120.28	1.083E-03	(	6.098E-04		G
RA-224	1.2992E-03	241.00	1.299E-03	}(	2.045E-03		G
RA-226	0.0000E+00	185.99	0.000E+00	}	1.514E-03		G
AC-228	1.0062E-03	911.07	9.676E-04	(	2.557E-04		G
		968.90	1.070E-03	(	4.492E-04		G
		338.40	1.006E-03	(	4.064E-04		G
TH-227	1.4909E-04	236.00	1.491E-04	(	4.465E-04		G
		256.25	0.000E+00		6.711E-04		G
TH-234	1.5223E-03	63.29	1.522E-03	(	2.261E-03		G
		92.80	2.807E-03	}	1.789E-03		G
		92.38	0.000E+00	}	2.503E-03		G
U-235	3.4448E-04	185.72	3.445E-04	}	1.071E-04		G
		143.76	2.968E-04	(	3.889E-04		G
		205.31	4.511E-04	(	9.324E-04		G
		163.35	0.000E+00	%	6.867E-04		G
NP-237	0.0000E+00	86.49	0.000E+00	}	4.725E-04		G
		95.87	0.000E+00	%	1.759E-03		G
AM-241	0.0000E+00	59.54	0.000E+00	%	P	3.106E-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		1.3429E+01	1.3429E+01	1.8383E+00	1.9887E+00
CR-51	<	2.4172E-01	4.7627E-01		
MN-54	#A	2.5885E-02	2.7490E-02	5.3022E-02	5.3044E-02
MN-56	<	2.60E-02	>12 Halflives		
FE-59	#A	3.1895E-02	4.8376E-02	8.0096E-02	8.0143E-02
CO-57	<	2.4261E-01	2.6009E-01		
CO-58	<	3.0700E-02	4.0032E-02		
CO-60	#A	5.0754E-02	5.1252E-02	5.8573E-02	5.8645E-02
Cm-243	A	1.9519E-01	1.9551E-01	2.0005E-01	2.0036E-01
ZN-65	<	1.1747E-01	1.2688E-01		
Kr-85	<	9.7584E+02	9.7604E+02		
Y-88	#A	6.1174E-03	7.2963E-03	1.7655E-02	1.7660E-02
NB-94	#A	1.4968E-02	1.4968E-02	3.0075E-02	3.0087E-02
Ag-108M	<	3.1881E-02	3.1894E-02		
AG-110M	<	3.1208E-02	3.3644E-02		
CD-109	<	1.1040E+00	1.1507E+00		
SN-113	A	2.1183E-02	2.4939E-02	5.3992E-02	5.4010E-02
SB-125	C	1.5883E-01	1.6181E-01	1.4318E-01	1.4347E-01
TE-131	C	5.9762E-02	>12 Halflives	7.6081E-02	7.6153E-02
TE-132	<	2.1198E-02	6.9151E+00		
J-131	<	3.3820E-02	3.4991E-01		
CS-134	A	1.8392E-02	1.8856E-02	3.1021E-02	3.1040E-02
CS-137	#	7.3154E-02	7.3279E-02	5.0108E-02	5.0279E-02
CE-139	A	1.5905E-02	1.8234E-02	3.2722E-02	3.2739E-02
CE-141	A	2.6015E-02	4.6473E-02	9.2153E-02	9.2189E-02
CE-144	<	2.5988E-01	2.7764E-01		
EU-152	C	1.7998E-01	1.8071E-01	1.3132E-01	1.3171E-01
EU-154	<	6.5860E-02	6.6259E-02		
EU-155	A	5.0037E-02	5.0559E-02	1.2886E-01	1.2890E-01
TA-182	#	1.9507E-01	2.2968E-01	2.1495E-01	2.1533E-01
HG-203	C	4.8500E-02	7.2587E-02	7.7773E-02	7.7881E-02
TL-208		2.3267E-01	>12 Halflives	7.9803E-02	8.0878E-02
PB-212		7.7556E-01	>12 Halflives	1.0787E-01	1.1643E-01
PB-214		5.2545E-01	>12 Halflives	1.1541E-01	1.1916E-01
BI-207	#A	4.7146E-02	4.7210E-02	9.2020E-02	9.2059E-02

BI-212		5.9226E-01	>12 Halflives	3.6977E-01	3.7128E-01
BI-214		6.1444E-01	>12 Halflives	1.3625E-01	1.4061E-01
RA-224	#	7.9709E-01	1.3511E+02	1.5740E+05	1.2362E+02
AC-228		6.1729E-01	>12 Halflives	1.6774E-01	1.7133E-01
TH-227	A	9.1467E-02	2.5251E-01	6.7859E-01	6.7874E-01
TH-234	A	9.3390E-01	2.0363E+00	2.7911E+00	2.7934E+00
U-235	A	2.1134E-01	2.1134E-01	2.3700E-01	2.3729E-01
NP-237	<	1.0792E+00	1.0792E+00		
AM-241	<	1.9055E-01	1.9057E-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) 1.6622208E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 1.5231120E+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_10JAN2005_1810.An1

Sample description
Detector 101 FSS-OOL-14-01-005-F SOIL

Spectrum Filename: C:\GammaVision\Spectra\101F_10JAN2005_1810.An1

Acquisition information
Start time: 10-Jan-2005 18:00:33
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: 1.7190E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7190E+03) =
5.8173E+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	14-Dec-2004 15:18:00
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: 0.1501

********** 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	
174.06	87.13	425.	119.	0.060	78.38	1.014	PB-214	D
179.67	89.93	362.	71.	0.035	119.39	1.016	PB-214	D
299.99	150.17	232.	57.	0.029	119.95	1.059	TE-131	D
307.82	154.08	199.	67.	0.033	97.09	1.062	XE-138	D
380.44	190.29	169.	47.	0.024	124.10	1.087	FE-59	D
417.93	209.13	158.	154.	0.077	62.41	1.362	AC-228	s
540.73	270.50	108.	48.	0.024	151.55	1.072	AC-228	s
599.85	300.05	56.	82.	0.041	51.07	1.165	PB-212	D
655.74	327.98	63.	59.	0.030	71.10	1.004	AC-228	
926.14	463.12	68.	39.	0.020	116.51	1.295	AC-228	s
954.22	477.16	21.	14.	0.007	165.29	0.847	BE-7	
1720.47	860.09	37.	30.	0.015	125.54	0.611	TL-208	s
1929.23	964.46	28.	36.	0.018	80.64	1.613	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	135.	25.	0.012	207.25	0.994D
TH-234	126.14	63.29	310.	45.	0.022	171.98	0.997D
TA-182	136.53	68.48	522.	25.	0.013	445.69	0.442s
HG-203	145.31	72.87	377.	0.	0.000	0.00	0.000D
PB-212	149.19	74.81	357.	305.	0.153	31.37	1.005D
BI-207	149.51	74.97	536.	0.	0.000	0.00	0.000D
PB-214	153.79	77.11	373.	418.	0.209	24.51	1.006D
PB-212	153.79	77.11	458.	0.	0.000	109.88	0.488D
CE-144	159.81	80.12	144.	0.	0.000	0.00	0.000D
EU-155	172.48	86.45	439.	16.	0.008	562.92	1.013D
NP-237	172.56	86.49	455.	0.	0.000	0.00	1.013D
CD-109	175.66	88.04	491.	0.	0.000	0.00	1.014D
TH-234	184.34	92.38	442.	9.	0.005	983.70	1.018D
TH-234	185.18	92.80	366.	89.	0.045	96.31	1.018D
NP-237	191.32	95.87	341.	0.	0.000	0.00	1.020D
Cm-243	198.69	99.55	329.	0.	0.000	0.00	1.023D
Cm-243	207.11	103.76	313.	0.	0.000	0.00	1.026D
EU-155	210.21	105.31	317.	1.	0.000	10482.30	1.027D
TE-132	221.87	111.14	172.	20.	0.010	384.08	0.586s
TE-132	232.20	116.30	213.	0.	0.000	0.00	0.625D
Cm-243	235.83	118.12	158.	50.	0.025	145.73	1.333s
EU-152	243.16	121.78	193.	0.	0.000	0.00	1.038D
CO-57	243.74	122.07	159.	34.	0.017	159.24	1.039D
EU-154	245.80	123.10	222.	5.	0.002	1289.64	1.039D
CE-144	266.67	133.53	278.	20.	0.010	353.56	1.047D
CO-57	272.48	136.43	212.	11.	0.006	562.81	1.049D
U-235	287.14	143.76	222.	6.	0.003	1036.12	1.054D
CE-141	290.52	145.45	241.	21.	0.011	318.69	1.055D
TE-131	299.07	149.72	294.	0.	0.000	0.00	1.058D
U-235	326.34	163.35	219.	14.	0.007	458.07	1.068D
CE-139	331.34	165.85	148.	28.	0.014	191.14	1.069D
SB-125	354.83	177.59	147.	30.	0.015	248.60	0.551s
U-235	371.10	185.72	304.	0.	0.000	0.00	1.084A
RA-226	371.64	185.99	171.	134.	0.067	48.73	1.148A
U-235	410.29	205.31	102.	0.	0.000	0.00	1.000D
TE-132	454.14	227.23	102.	0.	0.000	5686.17	0.421s
TH-227	471.70	236.00	142.	6.	0.003	875.29	1.120D
PB-212	476.96	238.63	161.	747.	0.374	13.13	1.122D
RA-224	481.70	241.00	171.	86.	0.043	71.95	1.982A
PB-214	483.54	241.92	215.	99.	0.049	7.75	1.124A
SN-113	509.79	255.04	93.	7.	0.004	567.20	1.133D
TH-227	512.21	256.25	125.	10.	0.005	473.13	1.134D
Cm-243	554.93	277.60	78.	40.	0.020	104.19	1.149D
HG-203	558.07	279.17	114.	3.	0.002	550.79	1.150D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
J-131	566.74	283.50	113.	21.	0.010	260.84	0.441s
PB-214	590.19	295.22	79.	200.	0.100	28.41	1.161D
CR-51	641.93	321.08	55.	5.	0.002	617.25	0.562s
AC-228	676.23	338.23	114.	133.	0.067	48.01	1.461s
EU-152	688.76	344.48	38.	8.	0.004	349.28	0.764
PB-214	703.66	351.93	108.	359.	0.179	21.56	1.118
J-131	728.53	364.36	66.	38.	0.019	176.53	0.622s
SN-113	782.60	391.38	40.	51.	0.026	99.43	0.792s
SB-125	859.87	430.00	45.	8.	0.004	416.78	0.717s
Ag-108M	868.36	434.24	48.	19.	0.009	195.22	0.792s
TE-131	906.67	453.39	28.	5.	0.002	468.61	0.834
SB-125	926.92	463.51	68.	0.	0.000	0.00	1.295D
TE-131	985.00	492.54	28.	1.	0.001	2355.84	0.000s
TL-208	1021.38	510.72	62.	74.	0.037	56.85	1.311D
Kr-85	1027.92	513.99	46.	2.	0.001	1216.45	1.313D
CS-134	1139.00	569.50	9.	0.	0.000	0.00	0.000s
BI-207	1139.00	569.50	9.	0.	0.000	0.00	0.000s
TL-208	1166.18	583.08	42.	221.	0.111	25.29	1.289
SB-125	1201.57	600.77	28.	0.	0.000	0.00	0.458D
CS-134	1209.35	604.66	33.	12.	0.006	217.55	1.374D
BI-214	1218.68	609.32	33.	278.	0.139	20.03	1.378D
Ag-108M	1228.78	614.37	26.	1.	0.001	1522.17	1.381D
SB-125	1269.92	634.93	24.	10.	0.005	251.00	0.517s
J-131	1274.00	636.97	33.	0.	0.000	0.00	1.396
AG-110M	1315.58	657.75	40.	3.	0.001	917.06	1.410D
CS-137	1323.33	661.62	36.	30.	0.015	99.31	1.413D
NB-94	1404.08	701.98	24.	25.	0.013	118.19	0.729s
Ag-108M	1446.05	722.95	22.	0.	0.000	0.00	1.454D
EU-154	1446.75	723.30	20.	4.	0.002	543.40	1.454D
BI-212	1454.49	727.17	31.	46.	0.023	67.80	1.457D
EU-152	1557.59	778.69	9.	3.	0.001	480.23	0.684s
BI-212	1570.98	785.38	26.	22.	0.011	123.83	1.196
CS-134	1591.67	795.72	28.	0.	0.000	0.00	1.502
CS-134	1603.07	801.42	21.	10.	0.005	239.28	0.551s
CO-58	1620.33	810.05	24.	12.	0.006	212.13	0.687s
MN-54	1669.83	834.78	11.	1.	0.000	1326.65	0.701s
MN-56	1691.67	845.69	9.	1.	0.001	893.73	0.382s
NB-94	1741.00	870.35	4.	1.	0.001	793.73	0.000s
AG-110M	1768.00	883.84	6.	0.	0.000	960.47	0.200s
Y-88	1798.27	898.97	14.	3.	0.001	433.80	0.583s
AC-228	1822.10	910.88	34.	150.	0.075	33.49	1.304s
AG-110M	1873.08	936.35	10.	2.	0.001	648.07	0.273s
EU-152	1928.41	964.00	38.	0.	0.000	0.00	0.980D
AC-228	1938.21	968.90	30.	84.	0.042	43.06	1.616D
EU-154	2011.21	1005.38	10.	8.	0.004	198.43	1.211
BI-207	2128.09	1063.78	8.	4.	0.002	356.12	0.445s
FE-59	2200.79	1100.11	24.	16.	0.008	169.77	0.697s
EU-152	2224.72	1112.07	22.	0.	0.000	0.00	1.339D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
ZN-65	2231.62	1115.52	27.	6.	0.003	361.59	1.710D
BI-214	2241.15	1120.28	23.	54.	0.027	56.04	1.713D
TA-182	2243.15	1121.28	47.	0.	0.000	0.00	0.213D
TE-131	2292.50	1145.94	14.	2.	0.001	821.58	0.703s
CO-60	2347.00	1173.17	14.	0.	0.000	0.00	0.000s
TA-182	2378.71	1189.02	24.	8.	0.004	280.62	0.631s
TA-182	2442.40	1220.84	8.	1.	0.001	1081.67	0.545s
EU-154	2546.79	1273.01	15.	4.	0.002	483.15	0.459s
FE-59	2583.88	1291.54	20.	28.	0.014	114.73	1.582s
CO-60	2667.16	1333.15	15.	7.	0.003	143.68	3.175s
AG-110M	2764.17	1381.63	3.	10.	0.005	130.20	0.613s
EU-152	2816.42	1407.73	3.	12.	0.006	110.40	0.661s
K-40	2921.78	1460.38	15.	626.	0.313	12.68	1.682
BI-212	3233.88	1616.32	6.	3.	0.002	458.26	0.455s
BI-214	3529.47	1764.02	0.	34.	0.017	51.45	0.857s
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		2.6854E-02	1460.75	2.685E-02	(	8.995E-04	G
CR-51		0.0000E+00	320.07	0.000E+00	&	4.279E-04	G
MN-54		0.0000E+00	834.81	0.000E+00	%	5.175E-05	G
MN-56		0.0000E+00	846.60	0.000E+00	&	4.726E-05	G
			1811.20	0.000E+00	?	1.512E-04	G
FE-59		1.7384E-04	1099.22	1.025E-04	&(	1.614E-04	G
			1291.56	2.672E-04	(	2.247E-04	G
CO-57		0.0000E+00	122.07	2.535E-05	} P	4.589E-05	G
			136.43	0.000E+00	%	4.296E-04	G
CO-58		3.3057E-05	810.75	3.306E-05	(	7.035E-05	G
CO-60		2.9064E-05	1332.51	2.906E-05	*(P	8.830E-05	G
			1173.23	0.000E+00	? P	7.625E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
Cm-243	2.8513E-04	277.60	2.851E-04	(	3.100E-04	G
		117.00	2.990E-04	}	3.623E-04	G
		103.76	0.000E+00	!	2.417E-04	G
		99.55	0.000E+00	!	4.029E-04	G
ZN-65	0.0000E+00	1115.52	0.000E+00	%	1.912E-04	G
Kr-85	0.0000E+00	513.99	0.000E+00	%	1.424E+00	G
Y-88	0.0000E+00	1836.01	0.000E+00	? P	4.191E-05	G
		898.02	0.000E+00	& P	6.457E-05	G
NB-94	0.0000E+00	871.10	0.000E+00	%	3.514E-05	G
		702.50	6.014E-05		6.144E-05	G
Ag-108M	0.0000E+00	722.95	0.000E+00	}	6.704E-05	G
		614.37	0.000E+00	%	6.183E-05	G
		433.93	3.154E-05		5.932E-05	G
AG-110M	0.0000E+00	657.75	0.000E+00	%	7.691E-05	G
		884.67	0.000E+00	&	5.930E-05	G
		937.48	0.000E+00	&	1.585E-04	G
		1384.27	1.859E-04	&	1.856E-04	G
CD-109	0.0000E+00	88.04	0.000E+00	%	1.955E-03	G
SN-113	1.0979E-04	391.71	1.098E-04	*(P	6.864E-05	G
		255.04	0.000E+00	%	2.108E-03	G
SB-125	0.0000E+00	427.95	0.000E+00	&	1.725E-04	G
		600.77	0.000E+00	!	3.118E-04	G
		636.15	1.959E-04	}	5.004E-04	G
		463.51	0.000E+00	!	6.657E-04	G
		176.29	3.362E-04	&	6.635E-04	G
TE-131	0.0000E+00	149.72	0.000E+00	!	7.909E-05	G
		452.32	0.000E+00	&	2.376E-04	G
		1146.96	0.000E+00	&	1.509E-03	G
		492.66	0.000E+00	%	9.728E-04	G
TE-132	0.0000E+00	228.16	0.000E+00	&	4.719E-05	G
		116.30	0.000E+00	}	2.321E-03	G
		111.76	0.000E+00	&	2.220E-03	G
J-131	7.9621E-05	364.48	5.986E-05	*(	6.391E-05	G
		636.97	0.000E+00	}	8.911E-04	G
		284.29	3.446E-04	&(	8.724E-04	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-134	4.8652E-05	604.66	2.614E-05	(	6.319E-05		G
		795.76	0.000E+00	%	8.634E-05		G
		569.29	0.000E+00	}	2.137E-04		G
		801.84	3.004E-04	(	7.530E-04		G
CS-137	8.1881E-05	661.62	8.188E-05	(	8.203E-05		G
CE-139	2.4078E-05	165.85	2.408E-05	(P	5.088E-05		G
CE-141	0.0000E+00	145.45	0.000E+00	%	1.023E-04		G
CE-144	0.0000E+00	133.53	0.000E+00	%	4.785E-04		G
		80.12	0.000E+00	&	2.756E-03		G
EU-152	0.0000E+00	121.78	0.000E+00	}	1.474E-04		G
		344.30	0.000E+00	%	1.401E-04		G
		1408.08	2.515E-04		2.260E-04		G
		964.00	0.000E+00	?	6.887E-04		G
		1112.07	0.000E+00	&	6.546E-04		G
		778.90	0.000E+00	%	3.447E-04		G
EU-154	0.0000E+00	123.10	0.000E+00	%	1.140E-04		G
		1274.80	0.000E+00	&	2.383E-04		G
		723.30	0.000E+00	}	2.932E-04		G
		1004.80	1.506E-04	?	3.283E-04		G
EU-155	0.0000E+00	86.45	0.000E+00	}	2.169E-04		G
		105.31	0.000E+00	%	2.554E-04		G
TA-182	0.0000E+00	67.75	0.000E+00	&	2.599E-04		G
		1121.28	0.000E+00	&	3.597E-04		G
		1221.42	0.000E+00	%	2.277E-04		G
		1189.05	1.865E-04	?	5.955E-04		G
HG-203	0.0000E+00	279.17	0.000E+00	% P	6.394E-05		G
		72.87	0.000E+00	&	1.238E-03		G
TL-208	5.3355E-04	583.14	5.195E-04	(	7.736E-05		G
		510.72	5.872E-04	(	3.113E-04		G
PB-212	1.5043E-03	238.63	1.504E-03	(	1.246E-04		G
		77.11	0.000E+00	}	4.598E-04		Energy duplication
		74.81	2.599E-03	}	7.728E-04		G
PB-214	1.1593E-03	351.99	1.196E-03	(	1.706E-04		G
		295.22	1.088E-03	(	2.402E-04		G
		77.11	3.066E-03	}	6.809E-04		Energy duplication

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
		241.92	1.159E-03	}	8.336E-04	G
BI-207	0.0000E+00	569.67	0.000E+00	}	3.367E-05	G
		1063.62	0.000E+00	%	7.306E-05	G
		74.97	0.000E+00	}	2.334E-04	G
BI-212	9.7251E-04	727.17	9.725E-04	(	6.068E-04	G
		1620.56	0.000E+00	&	2.588E-03	G
		785.42	2.995E-03	+	3.493E-03	G
BI-214	1.2532E-03	609.32	1.269E-03	(	1.348E-04	G
		1764.51	1.163E-03	(	2.521E-04	G
		1120.28	1.299E-03	(	6.113E-04	G
RA-224	1.9354E-03	241.00	1.935E-03	}(	2.268E-03	G
RA-226	2.9790E-03	185.99	2.979E-03	}(	1.393E-03	G
AC-228	1.5104E-03	911.07	1.572E-03	@(	3.132E-04	G
		968.90	1.538E-03	(	5.212E-04	G
		338.40	1.322E-03	@(	5.194E-04	G
TH-227	0.0000E+00	236.00	0.000E+00	%	4.474E-04	G
		256.25	0.000E+00	%	7.418E-04	G
TH-234	1.3925E-03	63.29	1.393E-03	(	2.624E-03	G
		92.80	2.021E-03	}	2.079E-03	G
		92.38	0.000E+00	}	2.667E-03	G
U-235	0.0000E+00	185.72	0.000E+00	}	1.130E-04	G
		143.76	0.000E+00	%	4.480E-04	G
		205.31	0.000E+00	!	8.221E-04	G
		163.35	0.000E+00	%	1.039E-03	G
NP-237	0.0000E+00	86.49	0.000E+00	}	5.515E-04	G
		95.87	0.000E+00	!	2.007E-03	G
AM-241	1.0721E-04	59.54	1.072E-04	(P	2.480E-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	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
K-40		1.5622E+01	1.5622E+01	1.9815E+00	2.1692E+00
CR-51	<	2.4893E-01	4.9061E-01		
MN-54	<	3.0105E-02	3.1973E-02		
MN-56	<	2.75E-02	>12 Halflives		
FE-59		1.0113E-01	1.5341E-01	1.5717E-01	1.5741E-01
CO-57	<	2.4989E-01	2.6790E-01		
CO-58	A	1.9230E-02	2.5078E-02	5.3199E-02	5.3218E-02
CO-60	#A	1.6908E-02	1.7073E-02	4.7679E-02	4.7689E-02
Cm-243	A	1.6587E-01	1.6614E-01	1.7310E-01	1.7335E-01
ZN-65	<	1.1122E-01	1.2013E-01		
Kr-85	<	8.2841E+02	8.2857E+02		
Y-88	<	2.4383E-02	2.9084E-02		
NB-94	<	2.0441E-02	2.0441E-02		
Ag-108M	<	3.5971E-02	3.5986E-02		
AG-110M	<	4.4741E-02	4.8236E-02		
CD-109	<	1.1375E+00	1.1856E+00		
SN-113	#	6.3869E-02	7.5197E-02	7.6515E-02	7.6633E-02
SB-125	<	1.0036E-01	1.0224E-01		
TE-131	<	4.60E-02	>12 Halflives		
TE-132	<	2.7452E-02	8.9741E+00		
J-131	#	4.6318E-02	4.7962E-01	7.5532E-01	7.5580E-01
CS-134	A	2.8303E-02	2.9018E-02	4.6921E-02	4.6950E-02
CS-137	A	4.7633E-02	4.7714E-02	4.7385E-02	4.7461E-02
CE-139	A	1.4007E-02	1.6058E-02	3.0847E-02	3.0861E-02
CE-141	<	5.9496E-02	1.0630E-01		

CE-144	<	2.7834E-01	2.9736E-01

EU-152	<	8.1510E-02	8.1841E-02		
EU-154	<	6.6290E-02	6.6693E-02		
EU-155	<	1.4860E-01	1.5015E-01		
TA-182	<	1.5122E-01	1.7807E-01		
HG-203	<	3.7197E-02	5.5679E-02		
TL-208		3.1038E-01	>12 Halflives	7.8486E-02	8.0422E-02
PB-212		8.7512E-01	>12 Halflives	1.1491E-01	1.2510E-01
PB-214		6.7441E-01	>12 Halflives	1.2026E-01	1.2615E-01
BI-207	<	4.2502E-02	4.2559E-02		
BI-212		5.6574E-01	>12 Halflives	3.8356E-01	3.8489E-01
BI-214		7.2903E-01	>12 Halflives	1.4603E-01	1.5173E-01
RA-224	#	1.1259E+00	1.9120E+02	1.7385E+05	1.3799E+02
RA-226	#	1.7330E+00	1.7331E+00	1.0120E+03	8.5019E-01
AC-228		8.7866E-01	>12 Halflives	2.1284E-01	2.1855E-01
TH-227	<	2.6026E-01	7.1877E-01		
TH-234	A	8.1007E-01	1.7668E+00	3.0385E+00	3.0401E+00
U-235	<	2.6063E-01	2.6063E-01		
NP-237	<	1.1678E+00	1.1678E+00		
AM-241	A	6.2369E-02	6.2376E-02	1.3063E-01	1.3068E-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) 1.9856752E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 2.1139703E+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_10JAN2005_1845.An1

Sample description
Detector 101 FSS-OOL-14-01-008-F SOIL

Spectrum Filename: C:\GammaVision\Spectra\101F_10JAN2005_1845.An1

Acquisition information
Start time: 10-Jan-2005 18:36:52
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: 1.5390E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5390E+03) =
6.4977E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	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	14-Dec-2004 14:58:00
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	

Energy Calibration
Normalized diff: 0.1899

********** 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	
168.44	84.40	287.	55.	0.027	137.00	1.012	TA-182	D
174.21	87.28	290.	121.	0.061	65.63	1.014	PB-214	D
179.60	89.98	270.	90.	0.045	83.52	1.016	PB-214	D
230.14	115.26	214.	43.	0.022	150.17	1.034	PA-234	D
257.07	128.73	206.	72.	0.036	132.73	1.145	AC-228	s
401.79	200.98	136.	37.	0.019	141.22	1.095	PA-234	D
418.42	209.29	133.	71.	0.035	78.05	1.101	AC-228	D
539.53	269.90	114.	83.	0.041	74.51	1.774	AC-228	s
600.64	300.45	51.	53.	0.026	90.74	0.844	PB-212	
1536.13	767.97	18.	33.	0.016	84.79	1.453	BI-214	sM

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	197.	25.	0.012	243.94	0.994D
TH-234	126.14	63.29	234.	48.	0.024	140.99	0.997D
TA-182	132.31	66.38	272.	45.	0.023	249.89	0.728s
HG-203	145.31	72.87	259.	0.	0.000	0.00	1.430D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PB-212	149.19	74.81	313.	204.	0.102	42.39	1.005D
BI-207	149.51	74.97	489.	28.	0.014	344.52	1.005D
PB-214	153.79	77.11	326.	351.	0.176	27.03	1.006D
PB-212	153.79	77.11	460.	0.	0.000	290.32	0.450D
CE-144	159.81	80.12	287.	27.	0.014	272.15	1.009D
EU-155	172.48	86.45	410.	0.	0.000	0.00	1.013D
NP-237	172.56	86.49	399.	11.	0.006	752.68	1.013D
CD-109	175.66	88.04	403.	7.	0.003	1226.79	1.014D
TH-234	184.34	92.38	392.	9.	0.004	986.22	1.017D
TH-234	185.18	92.80	283.	118.	0.059	66.50	1.018D
NP-237	191.32	95.87	257.	5.	0.003	1250.50	1.020D
Cm-243	198.69	99.55	229.	32.	0.016	206.37	1.023D
Cm-243	207.11	103.76	239.	26.	0.013	264.20	1.026D
EU-155	210.21	105.31	241.	25.	0.013	268.77	1.027D
TE-132	223.12	111.76	204.	20.	0.010	307.64	1.031D
TE-132	232.20	116.30	241.	0.	0.000	0.00	1.035D
Cm-243	233.60	117.00	233.	0.	0.000	0.00	1.035D
EU-152	243.16	121.78	162.	0.	0.000	0.00	1.038D
CO-57	243.74	122.07	163.	0.	0.000	0.00	1.039
EU-154	244.65	122.52	106.	21.	0.010	263.03	0.784
CE-144	267.00	133.69	81.	5.	0.002	864.29	0.500s
CO-57	273.63	137.00	210.	0.	0.000	0.00	1.049
U-235	287.14	143.76	193.	42.	0.021	148.20	1.054D
CE-141	290.52	145.45	222.	11.	0.005	601.56	1.055D
TE-131	299.07	149.72	267.	12.	0.006	574.13	1.058D
U-235	326.34	163.35	168.	48.	0.024	122.64	1.068D
CE-139	331.34	165.85	189.	26.	0.013	231.41	1.070D
SB-125	353.24	176.80	126.	37.	0.019	188.59	1.666s
U-235	371.10	185.72	245.	306.	0.153	4.51	1.084A
RA-226	371.64	185.99	200.	0.	0.000	6000.00	1.344A
U-235	410.29	205.31	151.	28.	0.014	191.57	1.098D
TE-132	458.33	229.32	127.	21.	0.010	247.90	1.243
TH-227	471.70	236.00	143.	21.	0.011	246.68	1.120D
PB-212	476.96	238.63	103.	679.	0.340	13.14	1.122D
RA-224	481.70	241.00	136.	80.	0.040	70.03	1.897A
PB-214	483.54	241.92	191.	77.	0.038	10.44	1.124A
SN-113	509.79	255.04	111.	16.	0.008	285.30	1.133D
TH-227	512.21	256.25	121.	11.	0.006	423.87	1.134D
Cm-243	554.93	277.60	74.	43.	0.022	96.36	1.149D
HG-203	558.07	279.17	116.	8.	0.004	340.27	1.150D
J-131	570.16	285.21	66.	16.	0.008	323.08	0.523s
PB-214	590.19	295.22	121.	169.	0.084	40.16	1.066
CR-51	637.04	318.64	61.	16.	0.008	241.29	0.930
AC-228	676.46	338.34	61.	117.	0.058	41.45	1.156
EU-152	686.62	343.42	34.	7.	0.003	365.93	0.353s
PB-214	703.69	351.95	101.	267.	0.134	26.40	1.130
J-131	727.25	363.72	40.	20.	0.010	222.49	1.624s
SN-113	783.83	392.00	45.	3.	0.001	719.37	0.500s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-125	857.00	428.57	36.	10.	0.005	300.00	1.002s
Ag-108M	866.48	433.30	40.	23.	0.012	148.53	1.687s
TE-131	904.00	452.06	23.	10.	0.005	240.84	1.291
SB-125	925.85	462.98	28.	56.	0.028	61.73	1.424
TE-131	984.84	492.46	27.	16.	0.008	162.79	0.797s
TL-208	1021.38	510.72	52.	73.	0.036	54.82	1.311D
Kr-85	1027.92	513.99	56.	6.	0.003	550.45	1.313D
CS-134	1138.58	569.29	19.	0.	0.000	0.00	0.567D
BI-207	1138.92	569.46	19.	11.	0.006	190.47	0.567s
TL-208	1166.34	583.17	29.	203.	0.101	25.02	1.210
SB-125	1201.57	600.77	35.	9.	0.005	286.03	1.372D
CS-134	1209.35	604.66	35.	3.	0.001	880.59	1.374D
BI-214	1218.68	609.32	28.	231.	0.116	22.01	1.378D
Ag-108M	1228.78	614.37	18.	0.	0.000	0.00	0.817D
SB-125	1273.12	636.53	25.	12.	0.006	221.74	0.659s
J-131	1274.00	636.97	32.	0.	0.000	0.00	0.000D
AG-110M	1315.58	657.75	24.	5.	0.003	404.50	1.410D
CS-137	1323.33	661.62	31.	38.	0.019	79.17	1.413D
NB-94	1409.82	704.84	26.	19.	0.010	148.88	0.499s
Ag-108M	1446.05	722.95	36.	7.	0.004	378.08	1.454D
EU-154	1446.75	723.30	12.	0.	0.000	0.00	0.000D
BI-212	1454.49	727.17	21.	38.	0.019	71.04	1.457D
EU-152	1563.10	781.45	35.	13.	0.007	262.78	0.673s
BI-212	1570.03	784.91	28.	10.	0.005	286.50	0.897s
CS-134	1591.75	795.76	32.	15.	0.008	175.41	1.502D
CS-134	1603.91	801.84	22.	0.	0.000	6171.40	1.506D
CO-58	1621.67	810.71	7.	1.	0.000	1077.03	0.511s
MN-54	1670.00	834.87	16.	4.	0.002	482.18	0.500s
MN-56	1691.65	845.69	18.	6.	0.003	357.07	0.543s
NB-94	1743.94	871.82	8.	8.	0.004	193.50	1.043
AG-110M	1770.19	884.94	12.	6.	0.003	289.86	1.177
Y-88	1796.47	898.07	5.	2.	0.001	342.64	0.639s
AC-228	1822.06	910.86	24.	123.	0.062	34.33	1.789
AG-110M	1874.40	937.01	3.	2.	0.001	483.74	0.402s
EU-152	1928.41	964.00	20.	0.	0.000	0.00	1.184D
AC-228	1938.22	968.90	28.	74.	0.037	50.96	1.916
EU-154	2010.74	1005.14	12.	7.	0.004	233.62	0.918s
BI-207	2129.27	1064.37	13.	13.	0.006	164.47	0.747s
FE-59	2198.67	1099.05	4.	1.	0.001	793.73	0.875s
EU-152	2224.72	1112.07	8.	0.	0.000	0.00	1.218D
ZN-65	2231.62	1115.52	26.	1.	0.000	2990.02	1.709D
BI-214	2241.15	1120.28	26.	47.	0.023	63.75	1.713D
TA-182	2243.15	1121.28	46.	0.	0.000	0.00	0.199D
TE-131	2289.00	1144.19	18.	6.	0.003	357.07	0.000s
CO-60	2346.20	1172.78	24.	21.	0.010	98.52	0.519s
TA-182	2382.00	1190.66	22.	15.	0.007	175.88	0.410s
TA-182	2440.49	1219.89	32.	25.	0.013	143.16	0.512s
EU-154	2547.91	1273.57	20.	18.	0.009	156.35	1.125s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
FE-59	2581.63	1290.41	6.	4.	0.002	295.16	2.264s
CO-60	2667.08	1333.12	14.	9.	0.005	125.06	0.711s
AG-110M	2771.40	1385.24	5.	8.	0.004	175.95	1.246s
EU-152	2819.00	1409.03	2.	1.	0.001	600.00	0.000s
K-40	2921.72	1460.35	17.	545.	0.273	13.67	1.972
BI-212	3236.00	1617.39	0.	6.	0.003	122.47	0.500s
BI-214	3529.41	1763.98	0.	37.	0.019	49.32	0.611s
MN-56	3622.00	1810.25	0.	0.	0.000	0.00	0.000s
Y-88	3674.50	1836.48	0.	2.	0.001	212.13	0.999s

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

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

- Nuclide - Name	Code	Average Activity microCi	Peak Energy keV	Peak Activity microCi	Code	MDA Value microCi	Comments
K-40		2.3406E-02	1460.75	2.341E-02	(	9.329E-04	G
CR-51		1.7988E-04	320.07	1.799E-04	&(	4.501E-04	G
MN-54		0.0000E+00	834.81	0.000E+00	%	6.005E-05	G
MN-56		0.0000E+00	846.60	0.000E+00	&	6.466E-05	G
			1811.20	0.000E+00	?	1.512E-04	G
FE-59		0.0000E+00	1099.22	0.000E+00	%	7.627E-05	G
			1291.56	3.976E-05	&	1.332E-04	G
CO-57		0.0000E+00	122.07	0.000E+00	} P	4.647E-05	G
			136.43	0.000E+00	%	4.275E-04	G
CO-58		0.0000E+00	810.75	0.000E+00	%	4.223E-05	G
CO-60		5.8521E-05	1332.51	3.824E-05	?(P	8.528E-05	G
			1173.23	7.882E-05	(P	9.738E-05	G
Cm-243		3.0453E-04	277.60	3.045E-04	(	3.029E-04	G
			117.00	0.000E+00	}	4.372E-04	G
			103.76	7.241E-05	-	2.124E-04	G
			99.55	1.487E-04	-	3.383E-04	G
ZN-65		0.0000E+00	1115.52	0.000E+00	%	1.882E-04	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Kr-85	0.0000E+00	513.99	0.000E+00	%		1.567E+00	G
Y-88	9.9714E-06	1836.01	9.971E-06	?(P		4.191E-05	G
		898.02	0.000E+00	% P		4.180E-05	G
NB-94	3.4693E-05	871.10	2.288E-05	?(		4.681E-05	G
		702.50	4.651E-05	&(		6.331E-05	G
Ag-108M	0.0000E+00	722.95	0.000E+00	}		8.364E-05	G
		614.37	0.000E+00	?		5.282E-05	G
		433.93	3.886E-05			5.438E-05	G
AG-110M	0.0000E+00	657.75	0.000E+00	%		6.059E-05	G
		884.67	2.574E-05			7.570E-05	G
		937.48	0.000E+00	%		1.019E-04	G
		1384.27	1.499E-04	&		2.298E-04	G
CD-109	0.0000E+00	88.04	0.000E+00	%		1.776E-03	G
SN-113	0.0000E+00	391.71	0.000E+00	% P		7.285E-05	G
		255.04	7.186E-04			2.294E-03	G
SB-125	0.0000E+00	427.95	0.000E+00	%		1.552E-04	G
		600.77	1.051E-04			3.408E-04	G
		636.15	2.351E-04	}		5.096E-04	G
		463.51	9.018E-04			4.457E-04	G
		176.29	4.146E-04			6.165E-04	G
TE-131	0.0000E+00	149.72	0.000E+00	%		7.547E-05	G
		452.32	8.392E-05	?		2.189E-04	G
		1146.96	0.000E+00	&		1.684E-03	G
		492.66	5.805E-04			9.516E-04	G
TE-132	1.9706E-05	228.16	1.971E-05	&(		5.227E-05	G
		116.30	0.000E+00	}		2.463E-03	G
		111.76	0.000E+00	%		2.405E-03	G
J-131	3.1505E-05	364.48	3.151E-05	&(		5.070E-05	G
		636.97	0.000E+00	}		8.746E-04	G
		284.29	0.000E+00	&		6.789E-04	G
CS-134	0.0000E+00	604.66	0.000E+00	%		6.498E-05	G
		795.76	4.790E-05			9.147E-05	G
		569.29	0.000E+00	}		2.925E-04	G
		801.84	0.000E+00	%		7.664E-04	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-137	1.0134E-04	661.62	1.013E-04	(	7.662E-05		G
CE-139	2.2206E-05	165.85	2.221E-05	(P	5.723E-05		G
CE-141	0.0000E+00	145.45	0.000E+00	%	9.841E-05		G
CE-144	0.0000E+00	133.53	0.000E+00	%	2.659E-04		G
		80.12	1.272E-03		3.845E-03		G
EU-152	0.0000E+00	121.78	0.000E+00	}	1.355E-04		G
		344.30	0.000E+00	&	1.343E-04		G
		1408.08	0.000E+00	%	1.950E-04		G
		964.00	0.000E+00	!	5.102E-04		G
		1112.07	0.000E+00	%	4.234E-04		G
		778.90	2.645E-04	&	6.160E-04		G
EU-154	1.1871E-04	123.10	3.317E-05	&(	8.005E-05		G
		1274.80	2.066E-04	&(	2.703E-04		G
		723.30	0.000E+00	}	2.406E-04		G
		1004.80	1.380E-04	?(	3.505E-04		G
EU-155	7.4891E-05	86.45	0.000E+00	}	2.098E-04		G
		105.31	7.489E-05	$(	2.236E-04		G
TA-182	2.3482E-04	67.75	1.072E-04	&(	1.895E-04		G
		1121.28	0.000E+00	&	3.591E-04		G
		1221.42	3.582E-04	&(	4.165E-04		G
		1189.05	3.497E-04	&(	5.728E-04		G
HG-203	0.0000E+00	279.17	0.000E+00	% P	6.439E-05		G
		72.87	0.000E+00	&	1.032E-03		G
TL-208	4.9714E-04	583.14	4.764E-04	(	6.570E-05		G
		510.72	5.764E-04	(	2.877E-04		G
PB-212	1.3677E-03	238.63	1.368E-03	(	1.007E-04		G
		77.11	0.000E+00	}	4.608E-04		Energy duplication
		74.81	1.736E-03	}	7.248E-04		G
PB-214	9.0096E-04	351.99	8.908E-04	(	1.651E-04		G
		295.22	9.206E-04	(	2.940E-04		G
		77.11	2.580E-03	}	6.372E-04		Energy duplication
		241.92	9.010E-04	}	7.888E-04		G
BI-207	5.7259E-05	569.67	2.287E-05	}	4.609E-05		G
		1063.62	5.726E-05	(	8.917E-05		G
		74.97	0.000E+00	}	2.233E-04		G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-212	9.0549E-04	727.17	7.956E-04	(	5.083E-04		G
		1620.56	1.099E-03	&(	1.350E-03		G
		785.42	1.287E-03	(	3.663E-03		G
BI-214	1.1137E-03	609.32	1.057E-03	(	1.254E-04		G
		1764.51	1.266E-03	(	2.521E-04		G
		1120.28	1.127E-03	(	6.373E-04		G
RA-224	1.8036E-03	241.00	1.804E-03	}(	2.081E-03		G
RA-226	0.0000E+00	185.99	0.000E+00	}	1.321E-03		G
AC-228	1.2838E-03	911.07	1.291E-03	(	2.668E-04		G
		968.90	1.360E-03	(	5.029E-04		G
		338.40	1.157E-03	(	3.887E-04		G
TH-227	1.6353E-04	236.00	1.635E-04	(	4.482E-04		G
		256.25	0.000E+00	%	7.303E-04		G
TH-234	1.4957E-03	63.29	1.496E-03	(	2.289E-03		G
		92.80	2.671E-03	}	1.836E-03		G
		92.38	0.000E+00	}	2.517E-03		G
U-235	4.1199E-04	185.72	4.120E-04	}	1.018E-04		G
		143.76	2.602E-04	(	4.191E-04		G
		205.31	4.685E-04	(	9.870E-04		G
		163.35	6.946E-04	(	9.145E-04		G
NP-237	0.0000E+00	86.49	0.000E+00	}	5.171E-04		G
		95.87	0.000E+00	%	1.749E-03		G
AM-241	1.0852E-04	59.54	1.085E-04	(P	2.968E-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		1.5209E+01	1.5209E+01	2.0792E+00	2.2498E+00
CR-51	A	1.1688E-01	2.3058E-01	5.5637E-01	5.5652E-01
MN-54	<	3.9022E-02	4.1446E-02		
MN-56	<	4.20E-02	>12 Halflives		
FE-59	<	4.9557E-02	7.5220E-02		
CO-57	<	2.7779E-01	2.9785E-01		
CO-58	<	2.7439E-02	3.5797E-02		
CO-60	A	3.8025E-02	3.8399E-02	4.8324E-02	4.8372E-02
Cm-243		1.9788E-01	1.9820E-01	1.9099E-01	1.9132E-01
ZN-65	<	1.2226E-01	1.3207E-01		
Kr-85	<	1.0180E+03	1.0182E+03		
Y-88	#A	6.4791E-03	7.7302E-03	1.8705E-02	1.8710E-02
NB-94	#A	2.2543E-02	2.2543E-02	2.7519E-02	2.7548E-02
Ag-108M	<	3.4319E-02	3.4333E-02		
AG-110M	<	3.9368E-02	4.2447E-02		
CD-109	<	1.1541E+00	1.2031E+00		
SN-113	<	4.7337E-02	5.5745E-02		
SB-125	<	1.0086E-01	1.0275E-01		
TE-131	<	4.90E-02	>12 Halflives		
TE-132	A	1.2805E-02	4.2210E+00	1.0464E+01	1.0466E+01
J-131	#A	2.0471E-02	2.1270E-01	4.7322E-01	4.7337E-01
CS-134	<	4.2221E-02	4.3290E-02		
CS-137		6.5850E-02	6.5963E-02	5.2224E-02	5.2357E-02
CE-139	A	1.4429E-02	1.6545E-02	3.8494E-02	3.8505E-02
CE-141	<	6.3941E-02	1.1434E-01		
CE-144	<	1.7274E-01	1.8457E-01		
EU-152	<	8.7262E-02	8.7617E-02		
EU-154	C	7.7131E-02	7.7600E-02	9.9580E-02	9.9673E-02
EU-155	A	4.8662E-02	4.9171E-02	1.3216E-01	1.3218E-01
TA-182	#	1.5258E-01	1.7971E-01	2.0214E-01	2.0239E-01

HG-203	<	4.1838E-02	6.2662E-02

TL-208		3.2303E-01	>12 Halflives	8.0834E-02	8.2869E-02
PB-212		8.8869E-01	>12 Halflives	1.1679E-01	1.2713E-01
PB-214		5.8542E-01	>12 Halflives	1.4068E-01	1.4452E-01
BI-207	A	3.7205E-02	3.7256E-02	6.1274E-02	6.1310E-02
BI-212		5.8836E-01	>12 Halflives	4.1797E-01	4.1929E-01
BI-214		7.2365E-01	>12 Halflives	1.5924E-01	1.6440E-01
RA-224	#	1.1719E+00	2.0050E+02	1.7446E+05	1.4088E+02
AC-228		8.3418E-01	>12 Halflives	2.0608E-01	2.1140E-01
TH-227	A	1.0625E-01	2.9387E-01	7.2491E-01	7.2510E-01
TH-234	A	9.7188E-01	2.1221E+00	2.9920E+00	2.9943E+00
U-235	A	2.6770E-01	2.6770E-01	2.4225E-01	2.4271E-01
NP-237	<	1.1367E+00	1.1367E+00		
AM-241	A	7.0514E-02	7.0523E-02	1.7382E-01	1.7386E-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) 1.8608099E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 2.2382146E+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_10jan2005_1920.An1

Sample description
Detector 101 FSS-OOL-14-01-001-F SOIL

Spectrum Filename: C:\GammaVision\Spectra\101f_10jan2005_1920.An1

Acquisition information
Start time: 10-Jan-2005 19:13:07
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: 1.6930E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6930E+03) =
5.9067E+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	14-Dec-2004 14:43:00
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: 0.1574

********** 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	
173.63	87.05	281.	115.	0.058	67.70	1.014	PB-214	D
418.48	209.30	171.	67.	0.034	89.85	1.101	AC-228	D
539.54	269.91	90.	85.	0.043	88.24	0.852	AC-228	s
600.28	300.26	42.	61.	0.031	74.42	1.197	PB-212	
655.85	328.04	45.	48.	0.024	94.37	0.919	AC-228	
925.33	462.72	34.	44.	0.022	77.09	1.131	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	175.	36.	0.018	163.20	0.994D
TH-234	126.14	63.29	254.	92.	0.046	79.50	0.996D
TA-182	134.58	67.51	170.	33.	0.016	211.84	0.910
HG-203	145.31	72.87	277.	0.	0.000	0.00	0.490D
PB-212	149.19	74.81	330.	260.	0.130	34.97	1.005D
BI-207	149.51	74.97	466.	0.	0.000	0.00	0.000D
PB-214	153.79	77.11	371.	378.	0.189	26.59	1.006D
PB-212	153.79	77.11	490.	0.	0.000	194.72	0.506D
CE-144	159.81	80.12	386.	0.	0.000	0.00	0.745D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-155	172.48	86.45	346.	4.	0.002	1972.99	1.013D
NP-237	172.56	86.49	350.	0.	0.000	0.00	1.013D
CD-109	175.66	88.04	342.	12.	0.006	634.64	1.014D
TH-234	184.34	92.38	368.	19.	0.010	432.20	1.018D
TH-234	185.18	92.80	324.	101.	0.050	81.57	1.018D
NP-237	191.32	95.87	290.	6.	0.003	1205.64	1.020D
Cm-243	198.69	99.55	290.	39.	0.020	189.90	1.023D
Cm-243	207.11	103.76	275.	19.	0.009	383.11	1.026D
EU-155	210.21	105.31	256.	38.	0.019	187.24	1.027D
TE-132	223.51	111.96	94.	50.	0.025	109.33	0.993
TE-132	232.20	116.30	330.	0.	0.000	0.00	1.845D
Cm-243	234.18	117.29	158.	24.	0.012	293.81	0.594s
EU-152	243.16	121.78	167.	0.	0.000	0.00	1.039D
CO-57	243.74	122.07	154.	14.	0.007	351.72	1.039D
EU-154	245.80	123.10	192.	2.	0.001	3001.42	1.040D
CE-144	267.86	134.12	180.	0.	0.000	0.00	1.047
CO-57	271.78	136.08	240.	37.	0.019	285.17	1.098s
U-235	287.14	143.76	191.	42.	0.021	147.06	1.054D
CE-141	290.52	145.45	218.	31.	0.016	207.24	1.055D
TE-131	299.07	149.72	250.	26.	0.013	267.16	1.058D
U-235	326.34	163.35	103.	48.	0.024	100.65	1.068D
CE-139	331.34	165.85	162.	41.	0.020	140.67	1.070D
SB-125	353.00	176.68	60.	21.	0.010	186.81	0.250s
U-235	371.10	185.72	301.	329.	0.164	3.87	1.084A
RA-226	371.64	185.99	189.	0.	0.000	5832.67	0.880A
U-235	410.29	205.31	149.	36.	0.018	150.27	1.098D
TE-132	457.44	228.88	100.	52.	0.026	135.55	2.695s
TH-227	471.70	236.00	170.	30.	0.015	193.38	1.120D
PB-212	476.96	238.63	121.	690.	0.345	13.26	1.121D
RA-224	481.70	241.00	148.	51.	0.026	109.01	1.658A
PB-214	483.54	241.92	165.	93.	0.047	8.84	1.124A
SN-113	509.79	255.04	94.	8.	0.004	505.34	1.133D
TH-227	512.21	256.25	106.	23.	0.012	199.30	1.134D
Cm-243	554.93	277.60	94.	30.	0.015	146.52	1.149D
HG-203	558.07	279.17	132.	4.	0.002	518.45	1.150D
J-131	567.27	283.77	89.	19.	0.009	242.20	0.539s
PB-214	590.41	295.33	116.	202.	0.101	34.24	1.003
CR-51	639.56	319.90	44.	34.	0.017	140.62	2.925s
AC-228	676.51	338.36	68.	128.	0.064	39.68	1.156
EU-152	689.00	344.61	20.	0.	0.000	0.00	0.000s
PB-214	703.62	351.91	93.	329.	0.164	21.94	1.184
J-131	727.33	363.76	40.	5.	0.002	553.17	0.500s
SN-113	782.78	391.47	28.	17.	0.008	187.08	0.649s
SB-125	854.26	427.20	32.	31.	0.015	133.74	0.636s
Ag-108M	868.22	434.18	50.	14.	0.007	275.55	1.269s
TE-131	905.64	452.88	47.	7.	0.004	441.03	0.450s
SB-125	926.92	463.51	34.	0.	0.000	0.00	1.131D
TE-131	982.33	491.21	17.	7.	0.004	274.42	0.525s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TL-208	1021.38	510.72	57.	91.	0.045	47.39	1.311D
Kr-85	1027.92	513.99	40.	2.	0.001	1336.40	1.313D
CS-134	1137.00	568.50	17.	6.	0.003	316.23	0.574s
BI-207	1139.34	569.67	23.	0.	0.000	0.00	1.351
TL-208	1165.97	582.98	50.	199.	0.100	27.48	1.134
SB-125	1201.57	600.77	37.	0.	0.000	0.00	0.657D
CS-134	1209.35	604.66	32.	13.	0.007	195.50	1.374D
BI-214	1218.68	609.32	37.	196.	0.098	25.18	1.378D
Ag-108M	1228.78	614.37	22.	6.	0.003	377.67	1.381D
SB-125	1272.36	636.15	20.	0.	0.000	0.00	0.388D
J-131	1270.50	635.22	13.	1.	0.001	1065.95	0.373s
AG-110M	1315.58	657.75	18.	2.	0.001	1024.55	1.410D
CS-137	1323.33	661.62	25.	31.	0.015	87.59	1.413D
NB-94	1403.31	701.59	26.	29.	0.014	109.15	1.166s
Ag-108M	1446.05	722.95	22.	0.	0.000	0.00	1.454D
EU-154	1446.75	723.30	16.	6.	0.003	302.77	1.454D
BI-212	1454.49	727.17	24.	52.	0.026	57.93	1.457D
EU-152	1557.50	778.65	6.	0.	0.000	0.00	0.583s
BI-212	1571.13	785.46	13.	8.	0.004	218.66	0.740s
CS-134	1591.75	795.76	41.	0.	0.000	0.00	1.502
CS-134	1603.67	801.72	5.	2.	0.001	584.81	0.394s
CO-58	1623.44	811.60	12.	6.	0.003	273.86	0.581s
MN-54	1672.39	836.06	14.	16.	0.008	135.83	1.508
MN-56	1688.00	843.86	12.	2.	0.001	675.59	0.666s
NB-94	1740.65	870.17	26.	16.	0.008	185.40	0.692s
AG-110M	1764.40	882.04	18.	7.	0.003	335.41	0.412s
Y-88	1799.34	899.50	14.	12.	0.006	164.47	0.636s
AC-228	1822.04	910.85	32.	142.	0.071	34.91	1.536
AG-110M	1874.23	936.93	26.	20.	0.010	166.59	0.562s
EU-152	1928.41	964.00	32.	0.	0.000	0.00	1.149D
AC-228	1937.65	968.62	26.	72.	0.036	49.95	1.600
EU-154	2013.00	1006.27	12.	2.	0.001	821.58	0.392s
BI-207	2124.22	1061.85	10.	2.	0.001	602.99	0.526s
FE-59	2197.12	1098.28	13.	3.	0.001	585.77	0.417s
EU-152	2224.72	1112.07	24.	0.	0.000	0.00	0.539D
ZN-65	2231.62	1115.52	24.	1.	0.001	1539.94	1.710D
BI-214	2241.15	1120.28	32.	40.	0.020	75.68	1.713D
TA-182	2243.15	1121.28	65.	5.	0.003	695.63	1.713D
TE-131	2295.00	1147.19	20.	11.	0.005	218.75	0.500s
CO-60	2348.00	1173.67	16.	0.	0.000	0.00	0.000s
TA-182	2376.76	1188.04	13.	5.	0.003	333.41	0.557s
TA-182	2443.00	1221.14	6.	0.	0.000	0.00	0.000s
EU-154	2550.04	1274.63	8.	12.	0.006	134.16	0.916s
FE-59	2577.60	1288.40	22.	5.	0.002	492.34	0.392s
CO-60	2664.14	1331.64	12.	13.	0.007	95.53	0.637s
AG-110M	2768.00	1383.54	0.	12.	0.006	86.60	0.500s
EU-152	2816.38	1407.71	4.	9.	0.005	142.75	2.368s
K-40	2921.74	1460.36	19.	550.	0.275	13.49	1.946

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	3241.46	1620.11	2.	7.	0.004	154.52	0.479s
BI-214	3529.77	1764.17	0.	30.	0.015	54.77	1.166s
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		2.3621E-02	1460.75	2.362E-02	(	9.805E-04	G
CR-51		3.9038E-04	320.07	3.904E-04	*(	3.860E-04	G
MN-54		4.3599E-05	834.81	4.360E-05	&(	5.578E-05	G
MN-56		0.0000E+00	846.60	0.000E+00	&	5.358E-05	G
			1811.20	0.000E+00	?	1.512E-04	G
FE-59		0.0000E+00	1099.22	0.000E+00	&	1.251E-04	G
			1291.56	0.000E+00	&	2.344E-04	G
CO-57		2.2521E-04	122.07	0.000E+00	} P	4.523E-05	G
			136.43	2.252E-04	*(	4.559E-04	G
CO-58		1.6528E-05	810.75	1.653E-05	&(	5.193E-05	G
CO-60		5.5897E-05	1332.51	5.590E-05	*(P	7.932E-05	G
			1173.23	0.000E+00	% P	8.084E-05	G
Cm-243		1.9755E-04	277.60	2.139E-04	(	3.386E-04	G
			117.00	1.451E-04	}	3.623E-04	G
			103.76	0.000E+00	%	2.272E-04	G
			99.55	1.816E-04	(	3.790E-04	G
ZN-65		0.0000E+00	1115.52	0.000E+00	%	1.814E-04	G
Kr-85		0.0000E+00	513.99	0.000E+00	%	1.340E+00	G
Y-88		0.0000E+00	1836.01	0.000E+00	? P	4.191E-05	G
			898.02	3.788E-05	& P	6.457E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
NB-94	5.8733E-05	871.10	4.771E-05	&(	7.687E-05	G
		702.50	6.976E-05	&(	6.368E-05	G
Ag-108M	0.0000E+00	722.95	0.000E+00	}	6.704E-05	G
		614.37	0.000E+00	%	5.814E-05	G
		433.93	2.281E-05	*	5.997E-05	G
AG-110M	0.0000E+00	657.75	0.000E+00	%	5.396E-05	G
		884.67	0.000E+00	&	9.210E-05	G
		937.48	1.771E-04	@	2.384E-04	G
		1384.27	2.158E-04	?	1.326E-04	G
CD-109	0.0000E+00	88.04	0.000E+00	%	1.639E-03	G
SN-113	3.5955E-05	391.71	3.596E-05	(P	5.876E-05	G
		255.04	0.000E+00	%	2.119E-03	G
SB-125	1.7066E-04	427.95	1.569E-04	&(	1.471E-04	G
		600.77	0.000E+00	!	3.495E-04	G
		636.15	0.000E+00	}	4.614E-04	G
		463.51	0.000E+00	&	4.873E-04	G
		176.29	2.353E-04	?(	4.349E-04	G
TE-131	8.8838E-05	149.72	2.466E-05	(	7.317E-05	G
		452.32	0.000E+00	%	2.999E-04	G
		1146.96	8.242E-04	?(	1.764E-03	G
		492.66	2.488E-04	&(	7.792E-04	G
TE-132	4.9187E-05	228.16	4.919E-05	&(	4.664E-05	G
		116.30	0.000E+00	}	2.867E-03	G
		111.76	1.737E-03	+	1.664E-03	G
J-131	0.0000E+00	364.48	0.000E+00	&	5.070E-05	G
		636.97	0.000E+00	}	5.832E-04	G
		284.29	3.113E-04	?	7.796E-04	G
CS-134	2.8784E-05	604.66	2.878E-05	(	6.194E-05	G
		795.76	0.000E+00	%	1.022E-04	G
		569.29	0.000E+00	}	2.808E-04	G
		801.84	0.000E+00	%	4.186E-04	G
CS-137	8.2981E-05	661.62	8.298E-05	(	7.014E-05	G
CE-139	3.4802E-05	165.85	3.480E-05	(P	5.320E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-141	4.2626E-05	145.45	4.263E-05	(	9.741E-05		G
CE-144	0.0000E+00	133.53	0.000E+00		3.879E-04		G
		80.12	0.000E+00	&	4.436E-03		G
EU-152	0.0000E+00	121.78	0.000E+00	}	1.375E-04		G
		344.30	0.000E+00	?	1.056E-04		G
		1408.08	1.956E-04	?	2.439E-04		G
		964.00	0.000E+00	?	6.368E-04		G
		1112.07	0.000E+00	&	6.784E-04		G
		778.90	0.000E+00	?	2.873E-04		G
EU-154	0.0000E+00	123.10	0.000E+00	%	1.063E-04		G
		1274.80	1.435E-04	?	1.776E-04		G
		723.30	0.000E+00	}	2.670E-04		G
		1004.80	0.000E+00	&	3.548E-04		G
EU-155	1.1203E-04	86.45	0.000E+00	}	1.932E-04		G
		105.31	1.120E-04	$(	2.305E-04		G
TA-182	7.8596E-05	67.75	7.860E-05	?(	1.512E-04		G
		1121.28	0.000E+00	%	4.194E-04		G
		1221.42	0.000E+00	?	2.024E-04		G
		1189.05	0.000E+00	&	4.524E-04		G
HG-203	0.0000E+00	279.17	0.000E+00	% P	6.851E-05		G
		72.87	0.000E+00	&	1.066E-03		G
TL-208	4.6780E-04	583.14	4.678E-04	(	8.383E-05		G
		510.72	7.177E-04	+	3.006E-04		G
PB-212	1.3898E-03	238.63	1.390E-03	(	1.085E-04		G
		77.11	0.000E+00	}	4.752E-04		Energy duplication
		74.81	2.214E-03	}	7.433E-04		G
PB-214	1.0965E-03	351.99	1.096E-03	(	1.591E-04		G
		295.22	1.098E-03	(	2.876E-04		G
		77.11	2.772E-03	}	6.791E-04		Energy duplication
		241.92	1.096E-03	}	7.341E-04		G
BI-207	0.0000E+00	569.67	0.000E+00	}	5.056E-05		G
		1063.62	0.000E+00	&	8.051E-05		G
		74.97	0.000E+00	}	2.180E-04		G
BI-212	1.1194E-03	727.17	1.091E-03	(	5.391E-04		G
		1620.56	1.283E-03	?(	1.704E-03		G
		785.42	1.065E-03	?(	2.598E-03		G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-214	9.3846E-04	609.32	8.955E-04	(	1.422E-04		G
		1764.51	1.026E-03	?(	2.521E-04		G
		1120.28	9.772E-04	(	7.003E-04		G
RA-224	1.1521E-03	241.00	1.152E-03	}(	2.066E-03		G
RA-226	0.0000E+00	185.99	0.000E+00	}	1.480E-03		G
AC-228	1.3974E-03	911.07	1.492E-03	(	3.032E-04		G
		968.90	1.329E-03	(	4.836E-04		G
		338.40	1.269E-03	(	4.078E-04		G
TH-227	2.6065E-04	236.00	2.292E-04	(	4.875E-04		G
		256.25	3.125E-04	$(	6.864E-04		G
TH-234	2.8604E-03	63.29	2.860E-03	(	2.381E-03		G
		92.80	2.280E-03	}	1.962E-03		G
		92.38	0.000E+00	}	2.440E-03		G
U-235	4.4230E-04	185.72	4.423E-04	}	1.124E-04		G
		143.76	2.610E-04	(	4.169E-04		G
		205.31	6.008E-04	(	9.806E-04		G
		163.35	6.889E-04	(	7.260E-04		G
NP-237	0.0000E+00	86.49	0.000E+00	}	4.855E-04		G
		95.87	0.000E+00	%	1.856E-03		G
AM-241	1.5619E-04	59.54	1.562E-04	(P	2.805E-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		1.3952E+01	1.3952E+01	1.8824E+00	2.0408E+00
CR-51	#	2.3058E-01	4.5529E-01	6.4025E-01	6.4077E-01
MN-54	A	2.5753E-02	2.7355E-02	3.7156E-02	3.7188E-02
MN-56	<	3.16E-02	>12 Halflives		
FE-59	<	7.3868E-02	1.1218E-01		
CO-57	#A	1.3302E-01	1.4264E-01	4.0676E-01	4.0684E-01
CO-58	#A	9.7628E-03	1.2741E-02	3.4893E-02	3.4900E-02
CO-60	#A	3.3016E-02	3.3341E-02	4.7480E-02	4.7518E-02
Cm-243	A	1.1668E-01	1.1687E-01	1.4016E-01	1.4032E-01
ZN-65	<	1.0715E-01	1.1576E-01		
Kr-85	<	7.9161E+02	7.9177E+02		
Y-88	<	2.4757E-02	2.9545E-02		
NB-94	#A	3.4692E-02	3.4692E-02	3.7319E-02	3.7370E-02
Ag-108M	<	3.4342E-02	3.4356E-02		
AG-110M	<	3.1874E-02	3.4370E-02		
CD-109	<	9.6814E-01	1.0092E+00		
SN-113	A	2.1237E-02	2.5015E-02	5.0142E-02	5.0162E-02
SB-125	#	1.0080E-01	1.0270E-01	1.1797E-01	1.1812E-01
TE-131	C	5.2474E-02	>12 Halflives	7.7146E-02	7.7201E-02
TE-132		2.9053E-02	9.6502E+00	1.3081E+01	1.3092E+01
J-131	<	2.9944E-02	3.1208E-01		
CS-134	A	1.7002E-02	1.7432E-02	3.4080E-02	3.4095E-02
CS-137		4.9014E-02	4.9098E-02	4.3007E-02	4.3097E-02
CE-139	A	2.0556E-02	2.3576E-02	3.3280E-02	3.3306E-02
CE-141	A	2.5178E-02	4.5058E-02	9.3378E-02	9.3411E-02
CE-144	<	2.2913E-01	2.4484E-01		
EU-152	<	6.2377E-02	6.2630E-02		
EU-154	<	6.2769E-02	6.3151E-02		
EU-155	A	6.6170E-02	6.6862E-02	1.2519E-01	1.2525E-01
TA-182	A	4.6424E-02	5.4690E-02	1.1586E-01	1.1590E-01
HG-203	<	4.0466E-02	6.0640E-02		
TL-208		2.7631E-01	>12 Halflives	7.5937E-02	7.7525E-02
PB-212		8.2094E-01	>12 Halflives	1.0890E-01	1.1836E-01
PB-214		6.4764E-01	>12 Halflives	1.3167E-01	1.3666E-01
BI-207	<	4.7554E-02	4.7619E-02		

BI-212		6.6117E-01	>12 Halflives	3.8302E-01	3.8484E-01
BI-214		5.5432E-01	>12 Halflives	1.3955E-01	1.4302E-01
RA-224	#	6.8048E-01	1.1721E+02	1.6684E+05	1.2794E+02
AC-228		8.2537E-01	>12 Halflives	2.0007E-01	2.0544E-01
TH-227	A	1.5396E-01	4.2638E-01	5.9202E-01	5.9251E-01
TH-234		1.6895E+00	3.6929E+00	2.9358E+00	2.9429E+00
U-235		2.6125E-01	2.6125E-01	2.0299E-01	2.0351E-01
NP-237	<	1.0963E+00	1.0963E+00		
AM-241	A	9.2253E-02	9.2264E-02	1.5167E-01	1.5175E-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) 1.7788618E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 1.4649065E+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_10jan2005_1955.An1

Sample description
Detector 101 FSS-OOL-14-01-002-F SOIL

Spectrum Filename: C:\GammaVision\Spectra\101f_10jan2005_1955.An1

Acquisition information
Start time: 10-Jan-2005 19:49:24
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: 1.4330E+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:	best method (based on spectrum).

YAEC Chemistry Lab Spectrum name: 101f_10jan2005_1955.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	14-Dec-2004 14:38:00
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: 0.1790

********** 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	
173.58	86.85	283.	115.	0.057	68.31	1.014	TB-160	D
179.55	89.84	251.	92.	0.046	79.54	1.016	PB-214	D
218.16	109.14	199.	40.	0.020	155.26	1.030	U-235	D
257.44	129.32	171.	70.	0.035	87.43	1.044	AC-228	D
405.10	202.70	92.	45.	0.022	100.70	1.096	PA-234	D
418.44	209.37	139.	55.	0.027	99.80	1.101	AC-228	D
540.71	270.49	60.	83.	0.041	70.74	2.103	AC-228	s
599.65	299.89	66.	60.	0.030	69.72	1.165	TH-227	D
655.14	327.68	36.	50.	0.025	90.99	1.803	AC-228	s
758.96	379.57	26.	15.	0.007	163.71	0.717	SB-125	s
1868.18	933.83	6.	19.	0.009	90.91	1.593	BI-214	D
2475.63	1237.45	26.	34.	0.017	93.38	1.167	J-133	sM

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	175.	49.	0.024	122.71	0.994D
TH-234	126.14	63.29	224.	76.	0.038	90.69	0.996D
TA-182	135.98	68.21	224.	56.	0.028	174.74	1.541s
HG-203	145.31	72.87	335.	25.	0.012	316.91	1.003D
PB-212	149.19	74.81	267.	224.	0.112	36.93	1.005D
BI-207	149.51	74.97	350.	0.	0.000	0.00	0.000D
PB-214	153.79	77.11	260.	341.	0.171	25.80	1.006D
PB-212	153.79	77.11	435.	0.	0.000	263.94	0.000D
CE-144	159.81	80.12	86.	0.	0.000	0.00	0.333D
EU-155	172.48	86.45	393.	0.	0.000	0.00	1.013D
NP-237	172.56	86.49	393.	0.	0.000	0.00	1.013D
CD-109	175.66	88.04	372.	25.	0.013	330.96	1.014D
TH-234	184.34	92.38	365.	0.	0.000	0.00	1.017D
TH-234	185.18	92.80	237.	123.	0.061	59.67	1.018D
NP-237	191.32	95.87	223.	0.	0.000	0.00	1.020D
Cm-243	198.69	99.55	130.	0.	0.000	0.00	1.309D
Cm-243	207.11	103.76	159.	0.	0.000	0.00	1.477D
EU-155	210.21	105.31	204.	9.	0.005	647.51	1.027D
TE-132	223.12	111.76	165.	0.	0.000	0.00	0.689D
TE-132	232.20	116.30	138.	0.	0.000	0.00	0.625D
Cm-243	231.13	115.77	138.	52.	0.026	141.79	0.625s
EU-152	243.16	121.78	195.	31.	0.016	198.28	1.038D
CO-57	243.74	122.07	227.	0.	0.000	0.00	1.039D
EU-154	245.80	123.10	220.	7.	0.003	910.99	1.039D
CE-144	266.67	133.53	209.	0.	0.000	20321.35	1.047D
CO-57	272.48	136.43	227.	4.	0.002	1486.69	1.049D
U-235	287.14	143.76	165.	24.	0.012	233.65	1.054D
CE-141	290.52	145.45	195.	29.	0.014	214.68	1.055D
TE-131	299.07	149.72	145.	21.	0.010	253.10	1.058D
U-235	326.34	163.35	90.	47.	0.023	97.23	1.068D
CE-139	331.34	165.85	160.	20.	0.010	277.38	1.070D
SB-125	353.81	177.08	60.	36.	0.018	130.70	0.840
U-235	371.10	185.72	269.	238.	0.119	4.84	1.084A
RA-226	371.64	185.99	148.	0.	0.000	5161.40	1.321A
U-235	410.29	205.31	137.	21.	0.010	246.15	1.098D
TE-132	458.63	229.47	112.	27.	0.014	269.20	0.588s
TH-227	471.70	236.00	108.	23.	0.012	198.25	1.120D
PB-212	476.96	238.63	91.	626.	0.313	13.61	1.121D
RA-224	481.70	241.00	116.	57.	0.028	89.85	1.554A
PB-214	483.54	241.92	143.	75.	0.038	8.74	1.124A
SN-113	509.79	255.04	39.	0.	0.000	0.00	0.450D
TH-227	513.25	256.77	48.	20.	0.010	218.40	0.613s
Cm-243	554.93	277.60	83.	48.	0.024	92.27	1.149D
HG-203	558.07	279.17	93.	18.	0.009	183.42	1.150D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
J-131	568.94	284.60	42.	16.	0.008	254.34	0.721s
PB-214	590.19	295.22	71.	166.	0.083	31.76	1.161D
CR-51	636.00	318.12	50.	7.	0.004	443.32	0.142s
AC-228	676.31	338.26	59.	101.	0.051	45.69	1.241
EU-152	689.82	345.02	34.	3.	0.002	828.46	0.411s
PB-214	703.64	351.92	72.	262.	0.131	24.65	1.128
J-131	729.00	364.60	15.	0.	0.000	0.00	0.000s
SN-113	782.00	391.08	18.	0.	0.000	0.00	0.167s
SB-125	855.10	427.62	33.	20.	0.010	158.93	1.799s
Ag-108M	867.00	433.57	12.	0.	0.000	0.00	0.000s
TE-131	902.16	451.14	33.	32.	0.016	147.19	0.678s
SB-125	925.26	462.68	48.	43.	0.022	92.47	1.011s
TE-131	983.00	491.54	28.	8.	0.004	321.13	0.181s
TL-208	1021.38	510.72	52.	66.	0.033	59.51	1.311D
Kr-85	1027.92	513.99	43.	7.	0.003	441.32	1.313D
CS-134	1138.39	569.20	32.	0.	0.000	0.00	1.350
BI-207	1141.00	570.50	30.	9.	0.004	314.47	0.367s
TL-208	1166.02	583.01	54.	166.	0.083	32.73	0.943
SB-125	1201.57	600.77	33.	6.	0.003	452.19	1.372D
CS-134	1209.35	604.66	28.	6.	0.003	388.26	1.374D
BI-214	1218.68	609.32	38.	186.	0.093	26.09	1.378D
Ag-108M	1228.78	614.37	29.	11.	0.006	225.49	1.381D
SB-125	1269.00	634.47	7.	0.	0.000	0.00	0.000s
J-131	1274.00	636.97	12.	0.	0.000	0.00	0.929D
AG-110M	1315.58	657.75	18.	0.	0.000	6801.00	1.410D
CS-137	1323.33	661.62	28.	31.	0.016	90.24	1.413D
NB-94	1404.00	701.94	7.	0.	0.000	0.00	0.167s
Ag-108M	1446.05	722.95	17.	0.	0.000	0.00	1.454D
EU-154	1446.75	723.30	17.	3.	0.001	622.35	1.454D
BI-212	1454.49	727.17	21.	46.	0.023	61.67	1.457D
EU-152	1557.00	778.40	4.	0.	0.000	0.00	0.083s
BI-212	1570.18	784.98	26.	24.	0.012	135.39	1.357s
CS-134	1591.75	795.76	31.	10.	0.005	244.07	1.502D
CS-134	1603.91	801.84	18.	2.	0.001	922.89	1.506D
CO-58	1624.95	812.35	15.	5.	0.002	391.15	0.822s
MN-54	1670.58	835.16	9.	12.	0.006	146.84	0.833s
MN-56	1694.26	846.99	13.	10.	0.005	208.70	0.587s
NB-94	1742.67	871.18	5.	0.	0.000	854.40	0.875s
AG-110M	1769.21	884.45	21.	16.	0.008	185.55	0.680s
Y-88	1795.00	897.33	10.	0.	0.000	0.00	0.000s
AC-228	1821.37	910.51	12.	108.	0.054	34.32	1.674
AG-110M	1875.34	937.48	22.	10.	0.005	222.00	1.595D
EU-152	1928.41	964.00	25.	16.	0.008	152.92	1.612D
AC-228	1938.21	968.90	22.	62.	0.031	50.18	1.615D
EU-154	2007.80	1003.67	12.	6.	0.003	318.54	1.495
BI-207	2124.73	1062.10	18.	11.	0.005	204.09	0.886s
FE-59	2199.43	1099.43	15.	13.	0.007	168.00	2.648s
EU-152	2224.72	1112.07	30.	5.	0.002	507.50	1.707D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
ZN-65	2231.62	1115.52	26.	9.	0.004	266.21	1.709D
BI-214	2241.15	1120.28	30.	41.	0.020	73.98	1.713D
TA-182	2243.15	1121.28	61.	6.	0.003	528.34	1.713D
TE-131	2292.97	1146.17	15.	6.	0.003	329.77	0.926s
CO-60	2346.26	1172.80	39.	19.	0.010	138.14	1.214
TA-182	2381.28	1190.30	15.	8.	0.004	234.84	0.600s
TA-182	2447.68	1223.48	20.	9.	0.004	263.17	0.552s
EU-154	2547.14	1273.18	12.	10.	0.005	186.90	0.570s
FE-59	2582.50	1290.85	5.	0.	0.000	0.00	0.583s
CO-60	2665.42	1332.28	9.	0.	0.000	0.00	1.019s
AG-110M	2768.00	1383.54	1.	0.	0.000	0.00	0.167s
EU-152	2817.44	1408.25	2.	1.	0.001	624.50	1.156s
K-40	2921.44	1460.21	21.	542.	0.271	13.96	1.966
BI-212	3241.60	1620.18	0.	8.	0.004	106.07	0.750s
BI-214	3528.23	1763.40	0.	23.	0.012	62.55	1.207s
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	Code	MDA Value microCi	Comments
K-40		2.3263E-02	1460.75	2.326E-02	(	1.033E-03	G
CR-51		0.0000E+00	320.07	0.000E+00	&	4.095E-04	G
MN-54		3.3754E-05	834.81	3.375E-05	(	4.695E-05	G
MN-56		2.7805E-05	846.60	2.781E-05	(	5.674E-05	G
			1811.20	0.000E+00	?	1.512E-04	G
FE-59		8.2417E-05	1099.22	8.242E-05	(	1.316E-04	G
			1291.56	0.000E+00	?	1.253E-04	G
CO-57		0.0000E+00	122.07	0.000E+00	} P	5.447E-05	G
			136.43	0.000E+00	%	4.435E-04	G
CO-58		0.0000E+00	810.75	0.000E+00	&	5.718E-05	G
CO-60		0.0000E+00	1332.51	0.000E+00	? P	7.225E-05	G
			1173.23	7.250E-05	? P	1.206E-04	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Cm-243	3.3699E-04	277.60	3.370E-04	(		3.204E-04	G
		117.00	3.079E-04	}		3.402E-04	G
		103.76	0.000E+00	&		1.745E-04	G
		99.55	0.000E+00	!		2.580E-04	G
ZN-65	6.3020E-05	1115.52	6.302E-05	(		1.899E-04	G
Kr-85	0.0000E+00	513.99	0.000E+00	%		1.392E+00	G
Y-88	0.0000E+00	1836.01	0.000E+00	?	P	4.191E-05	G
		898.02	0.000E+00	%	P	5.561E-05	G
NB-94	0.0000E+00	871.10	0.000E+00	%		3.732E-05	G
		702.50	0.000E+00	?		3.618E-05	G
Ag-108M	2.5956E-05	722.95	0.000E+00	}		5.983E-05	G
		614.37	2.596E-05	(		6.528E-05	G
		433.93	0.000E+00	?		3.185E-05	G
AG-110M	0.0000E+00	657.75	0.000E+00	%		5.337E-05	G
		884.67	6.367E-05	*		9.849E-05	G
		937.48	9.026E-05			2.235E-04	G
		1384.27	0.000E+00	?		1.326E-04	G
CD-109	0.0000E+00	88.04	0.000E+00	%		1.708E-03	G
SN-113	0.0000E+00	391.71	0.000E+00	&	P	4.835E-05	G
		255.04	0.000E+00	&		1.415E-03	G
SB-125	2.7250E-04	427.95	9.954E-05	*(		1.499E-04	G
		600.77	0.000E+00	%		3.348E-04	G
		636.15	0.000E+00	}		2.946E-04	G
		463.51	7.020E-04	&(		5.651E-04	G
		176.29	4.034E-04	&(		4.349E-04	G
TE-131	7.3928E-05	149.72	2.002E-05	(		5.633E-05	G
		452.32	2.778E-04	&(		2.559E-04	G
		1146.96	0.000E+00	%		1.555E-03	G
		492.66	0.000E+00	&		9.728E-04	G
TE-132	2.5540E-05	228.16	2.554E-05	&(		4.921E-05	G
		116.30	0.000E+00	}		1.886E-03	G
		111.76	0.000E+00	&		2.173E-03	G
J-131	0.0000E+00	364.48	0.000E+00	?		3.270E-05	G
		636.97	0.000E+00	}		5.699E-04	G
		284.29	2.668E-04	$		5.488E-04	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-134	0.0000E+00	604.66	0.000E+00	%		5.852E-05	G
		795.76	3.281E-05			8.987E-05	G
		569.29	0.000E+00	}		3.723E-04	G
		801.84	0.000E+00	%		6.984E-04	G
CS-137	8.3920E-05	661.62	8.392E-05	(		7.414E-05	G
CE-139	1.6969E-05	165.85	1.697E-05	(P		5.286E-05	G
CE-141	3.9005E-05	145.45	3.901E-05	(		9.247E-05	G
CE-144	0.0000E+00	133.53	0.000E+00	%		4.170E-04	G
		80.12	0.000E+00	&		2.163E-03	G
EU-152	0.0000E+00	121.78	6.783E-05	}		1.481E-04	G
		344.30	0.000E+00	&		1.337E-04	G
		1408.08	0.000E+00	%		1.950E-04	G
		964.00	3.493E-04			5.704E-04	G
		1112.07	0.000E+00	%		7.548E-04	G
		778.90	0.000E+00	?		2.447E-04	G
EU-154	0.0000E+00	123.10	0.000E+00	%		1.134E-04	G
		1274.80	1.186E-04	&		2.138E-04	G
		723.30	0.000E+00	}		2.754E-04	G
		1004.80	0.000E+00	&		3.505E-04	G
EU-155	0.0000E+00	86.45	0.000E+00	}		2.055E-04	G
		105.31	0.000E+00	%		2.064E-04	G
TA-182	1.4372E-04	67.75	1.334E-04	*(		1.726E-04	G
		1121.28	0.000E+00	%		4.059E-04	G
		1221.42	1.290E-04	&(		3.374E-04	G
		1189.05	1.943E-04	&(		4.793E-04	G
HG-203	2.1907E-05	279.17	2.191E-05	(P		5.810E-05	G
		72.87	0.000E+00	%		1.169E-03	G
TL-208	3.9022E-04	583.14	3.902E-04	(		8.687E-05	G
		510.72	5.204E-04	+		2.879E-04	G
PB-212	1.2609E-03	238.63	1.261E-03	(		9.479E-05	G
		77.11	0.000E+00	}		4.484E-04	Energy duplication
		74.81	1.904E-03	}		6.715E-04	G
PB-214	8.8513E-04	351.99	8.752E-04	(		1.404E-04	G
		295.22	9.043E-04	(		2.293E-04	G
		77.11	2.504E-03	}		5.714E-04	Energy duplication

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		241.92	8.851E-04	}		6.865E-04	G
BI-207	4.9725E-05	569.67	0.000E+00	}		5.696E-05	G
		1063.62	4.972E-05	&(		1.016E-04	G
		74.97	0.000E+00	}		1.897E-04	G
BI-212	1.0535E-03	727.17	9.574E-04	(		5.063E-04	G
		1620.56	1.466E-03	?(		1.350E-03	G
		785.42	3.262E-03	+		3.493E-03	G
BI-214	8.6433E-04	609.32	8.508E-04	(		1.436E-04	G
		1764.51	7.868E-04	&(		2.521E-04	G
		1120.28	9.878E-04	(		6.857E-04	G
RA-224	1.2701E-03	241.00	1.270E-03	}(		1.975E-03	G
RA-226	0.0000E+00	185.99	0.000E+00	}		1.308E-03	G
AC-228	1.1034E-03	911.07	1.127E-03	(		2.011E-04	G
		968.90	1.133E-03	(		4.546E-04	G
		338.40	1.005E-03	(		3.807E-04	G
TH-227	2.1402E-04	236.00	1.795E-04	(		3.920E-04	G
		256.25	2.709E-04	(		4.740E-04	G
TH-234	2.3445E-03	63.29	2.345E-03	(		2.244E-03	G
		92.80	2.782E-03	}		1.686E-03	G
		92.38	0.000E+00	}		2.430E-03	G
U-235	3.1988E-04	185.72	3.199E-04	}		1.064E-04	G
		143.76	1.500E-04	(		3.885E-04	G
		205.31	3.450E-04	(		9.437E-04	G
		163.35	6.742E-04	(		6.814E-04	G
NP-237	0.0000E+00	86.49	0.000E+00	}		5.135E-04	G
		95.87	0.000E+00	%		1.635E-03	G
AM-241	2.1167E-04	59.54	2.117E-04	(P		2.807E-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	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
K-40		1.6234E+01	1.6234E+01	2.2670E+00	2.4455E+00
CR-51	<	2.8573E-01	5.6459E-01		
MN-54	A	2.3555E-02	2.5022E-02	3.6743E-02	3.6770E-02
MN-56	#A	1.9403E-02	>12 Halflives	4.0495E-02	4.0510E-02
FE-59	#A	5.7514E-02	8.7384E-02	1.4681E-01	1.4689E-01
CO-57	<	3.0952E-01	3.3192E-01		
CO-58	<	3.9904E-02	5.2092E-02		
CO-60	<	5.0418E-02	5.0914E-02		
Cm-243		2.3516E-01	2.3554E-01	2.1733E-01	2.1774E-01
ZN-65	A	4.3977E-02	4.7515E-02	1.2649E-01	1.2652E-01
Kr-85	<	9.7156E+02	9.7176E+02		
Y-88	<	2.9249E-02	3.4912E-02		
NB-94	<	2.6042E-02	2.6042E-02		
Ag-108M	A	1.8113E-02	1.8120E-02	4.0860E-02	4.0872E-02
AG-110M	<	3.7240E-02	4.0161E-02		
CD-109	<	1.1920E+00	1.2426E+00		
SN-113	<	3.3738E-02	3.9747E-02		
SB-125		1.9016E-01	1.9374E-01	1.4569E-01	1.4610E-01
TE-131	C	5.1590E-02	>12 Halflives	7.5524E-02	7.5578E-02
TE-132	#A	1.7822E-02	5.9562E+00	1.6034E+01	1.6038E+01
J-131	<	2.2819E-02	2.3840E-01		
CS-134	<	4.0838E-02	4.1874E-02		
CS-137		5.8562E-02	5.8663E-02	5.2939E-02	5.3043E-02
CE-139	A	1.1842E-02	1.3583E-02	3.7943E-02	3.7951E-02
CE-141	A	2.7219E-02	4.8742E-02	1.0464E-01	1.0467E-01

CE-144	<	2.9098E-01	3.1095E-01

EU-152	<	9.3300E-02	9.3680E-02		
EU-154	<	7.9169E-02	7.9652E-02		
EU-155	<	1.4406E-01	1.4556E-01		
TA-182	A	1.0029E-01	1.1817E-01	1.5506E-01	1.5519E-01
HG-203	A	1.5288E-02	2.2919E-02	5.3969E-02	5.3984E-02
TL-208		2.7231E-01	>12 Halflives	8.9128E-02	9.0446E-02
PB-212		8.7988E-01	>12 Halflives	1.1978E-01	1.2968E-01
PB-214		6.1768E-01	>12 Halflives	1.2416E-01	1.2897E-01
BI-207	#A	3.4700E-02	3.4747E-02	7.0915E-02	7.0942E-02
BI-212		7.3517E-01	>12 Halflives	4.5100E-01	4.5291E-01
BI-214		6.0316E-01	>12 Halflives	1.5737E-01	1.6101E-01
RA-224	#	8.8632E-01	1.5349E+02	1.7478E+05	1.3818E+02
AC-228		7.7000E-01	>12 Halflives	1.9520E-01	1.9999E-01
TH-227	A	1.4935E-01	4.1406E-01	6.1066E-01	6.1111E-01
TH-234		1.6361E+00	3.5790E+00	3.2459E+00	3.2520E+00
U-235	A	2.2323E-01	2.2323E-01	2.1705E-01	2.1740E-01
NP-237	<	1.1411E+00	1.1411E+00		
AM-241	A	1.4771E-01	1.4773E-01	1.8224E-01	1.8242E-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) 2.0110947E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 1.8095134E+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_11JAN2004_1650.An1

Sample description
Detector 101 FSS-OOL-14-01-013-F SOIL

Spectrum Filename: C:\GammaVision\Spectra\101F_11JAN2004_1650.An1

Acquisition information

Start time:	11-Jan-2005 16:43:13
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:	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:	1.4580E+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%
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	14-Dec-2004 10:45:00
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: 0.1172

********** 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	
173.72	87.10	216.	106.	0.053	65.46	1.014	PB-214	D
179.70	90.08	229.	121.	0.061	59.39	1.016	PB-214	D
186.54	93.50	322.	72.	0.036	112.09	1.018	U-235	D
418.34	209.44	106.	94.	0.047	56.17	1.101	AC-228	D
600.32	300.28	76.	66.	0.033	101.00	1.715	PB-212	s
655.97	328.10	36.	31.	0.015	128.02	0.798	AC-228	
729.08	364.64	38.	34.	0.017	104.20	1.133	J-131	s
924.79	462.45	33.	26.	0.013	118.88	0.960	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	212.	29.	0.015	215.98	0.994D
TH-234	126.14	63.29	268.	25.	0.013	278.97	0.996D
TA-182	134.18	67.31	192.	38.	0.019	224.13	1.232s
HG-203	145.31	72.87	162.	0.	0.000	0.00	0.908D
PB-212	149.19	74.81	285.	229.	0.115	36.96	1.005D
BI-207	149.51	74.97	402.	0.	0.000	0.00	0.000D
PB-214	153.79	77.11	294.	367.	0.184	25.25	1.006D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PB-212	153.79	77.11	344.	0.	0.000	89.09	0.515D
CE-144	159.81	80.12	195.	0.	0.000	0.00	0.807D
EU-155	172.48	86.45	275.	0.	0.000	0.00	1.013D
NP-237	172.56	86.49	245.	30.	0.015	224.66	1.013D
CD-109	175.66	88.04	340.	41.	0.020	196.67	1.014D
TH-234	184.34	92.38	390.	0.	0.000	0.00	1.017D
TH-234	185.18	92.80	257.	124.	0.062	61.15	1.018D
NP-237	191.32	95.87	214.	19.	0.009	341.76	1.020D
Cm-243	198.69	99.55	207.	38.	0.019	167.17	1.023D
Cm-243	207.11	103.76	250.	30.	0.015	232.86	1.026D
EU-155	210.21	105.31	197.	56.	0.028	112.90	1.027D
TE-132	224.49	112.44	104.	24.	0.012	229.13	0.985
TE-132	229.98	115.19	138.	18.	0.009	362.51	0.256s
Cm-243	233.60	117.00	157.	0.	0.000	0.00	1.035
EU-152	244.15	122.27	216.	0.	0.000	0.00	1.039
CO-57	243.74	122.07	217.	0.	0.000	0.00	1.039D
EU-154	246.61	123.50	104.	19.	0.009	287.26	0.852
CE-144	266.50	133.44	162.	30.	0.015	260.38	0.523s
CO-57	272.48	136.43	192.	0.	0.000	0.00	0.749D
U-235	287.14	143.76	141.	24.	0.012	220.59	1.054D
CE-141	290.52	145.45	180.	26.	0.013	224.52	1.056D
TE-131	299.07	149.72	193.	20.	0.010	305.59	1.059D
U-235	326.34	163.35	127.	32.	0.016	157.29	1.068D
CE-139	331.34	165.85	185.	14.	0.007	414.49	1.070D
SB-125	348.32	174.34	169.	38.	0.019	165.69	1.425s
U-235	371.10	185.72	241.	183.	0.092	6.74	1.084A
RA-226	371.64	185.99	170.	0.	0.000	5531.73	1.266A
U-235	410.29	205.31	145.	14.	0.007	363.22	1.098D
TE-132	456.43	228.37	74.	36.	0.018	157.51	1.554s
TH-227	471.70	236.00	109.	23.	0.011	205.60	1.120D
PB-212	476.96	238.63	93.	687.	0.344	12.90	1.122D
RA-224	481.70	241.00	108.	67.	0.033	75.70	1.733A
PB-214	483.54	241.92	154.	79.	0.039	9.29	1.124A
SN-113	509.79	255.04	51.	0.	0.000	0.00	1.323D
TH-227	511.50	255.89	28.	0.	0.000	0.00	0.583s
Cm-243	554.93	277.60	81.	34.	0.017	124.72	1.149D
HG-203	558.07	279.17	89.	0.	0.000	0.00	1.150D
J-131	568.00	284.13	32.	2.	0.001	1396.42	0.222s
PB-214	590.18	295.22	82.	167.	0.084	35.18	1.204
CR-51	637.76	319.00	32.	9.	0.004	284.80	0.775
AC-228	676.56	338.39	77.	135.	0.068	41.76	1.292
EU-152	687.59	343.90	36.	2.	0.001	1140.62	0.677s
PB-214	703.52	351.86	78.	280.	0.140	24.29	1.305s
J-131	729.07	364.63	62.	0.	0.000	0.00	1.210
SN-113	779.17	389.67	66.	14.	0.007	297.21	0.562s
SB-125	856.33	428.23	31.	13.	0.007	207.30	0.732s
Ag-108M	867.54	433.84	26.	8.	0.004	290.47	1.254
TE-131	904.00	452.06	18.	0.	0.000	1712.45	0.000s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-125	927.31	463.70	50.	0.	0.000	0.00	1.278
TE-131	985.00	492.54	14.	2.	0.001	754.98	0.000s
TL-208	1021.38	510.72	45.	68.	0.034	55.33	1.311D
Kr-85	1027.92	513.99	51.	10.	0.005	319.41	1.313D
CS-134	1139.00	569.50	11.	0.	0.000	0.00	0.083s
BI-207	1138.77	569.39	41.	0.	0.000	0.00	1.351
TL-208	1166.29	583.14	50.	142.	0.071	36.10	1.319
SB-125	1201.57	600.77	13.	1.	0.000	1651.73	1.372D
CS-134	1209.35	604.66	20.	10.	0.005	201.90	1.374D
BI-214	1218.68	609.32	21.	220.	0.110	22.10	1.378D
Ag-108M	1228.78	614.37	34.	1.	0.000	2964.55	1.381D
SB-125	1273.87	636.91	21.	21.	0.010	136.28	0.852s
J-131	1274.00	636.97	22.	0.	0.000	0.00	0.564D
AG-110M	1315.23	657.57	17.	0.	0.000	0.00	1.410
CS-137	1322.70	661.31	23.	27.	0.013	106.07	1.531
NB-94	1398.00	698.94	22.	12.	0.006	203.67	0.202s
Ag-108M	1446.05	722.95	24.	5.	0.003	404.92	1.454D
EU-154	1446.75	723.30	33.	0.	0.000	0.00	1.454D
BI-212	1454.49	727.17	24.	38.	0.019	73.74	1.457D
EU-152	1558.17	778.98	4.	2.	0.001	441.59	0.481s
BI-212	1571.22	785.50	15.	18.	0.009	126.63	0.567s
CS-134	1591.75	795.76	15.	0.	0.000	0.00	1.502
CS-134	1601.20	800.48	10.	5.	0.002	300.00	0.986s
CO-58	1623.69	811.73	15.	8.	0.004	259.81	0.979s
MN-54	1670.12	834.92	20.	26.	0.013	107.00	0.645s
MN-56	1691.32	845.52	16.	6.	0.003	372.95	0.846s
NB-94	1744.23	871.96	17.	8.	0.004	261.53	0.843s
AG-110M	1767.22	883.45	28.	22.	0.011	165.25	0.441s
Y-88	1791.52	895.60	25.	18.	0.009	163.33	0.943s
AC-228	1822.20	910.92	28.	114.	0.057	39.35	1.166
AG-110M	1874.00	936.81	5.	2.	0.001	584.81	0.000s
EU-152	1928.41	964.00	29.	0.	0.000	0.00	1.066D
AC-228	1939.05	969.32	32.	62.	0.031	62.55	1.683s
EU-154	2009.67	1004.61	3.	1.	0.000	748.33	0.401s
BI-207	2132.65	1066.06	18.	7.	0.003	335.41	0.446s
FE-59	2203.12	1101.27	16.	11.	0.005	209.49	0.888s
EU-152	2224.72	1112.07	23.	0.	0.000	0.00	0.000D
ZN-65	2231.62	1115.52	26.	3.	0.002	714.58	1.710D
BI-214	2241.15	1120.28	24.	38.	0.019	72.11	1.713D
TA-182	2243.15	1121.28	50.	0.	0.000	0.00	1.713D
TE-131	2296.00	1147.69	7.	2.	0.001	670.82	0.650s
CO-60	2347.08	1173.21	24.	12.	0.006	123.92	1.078s
TA-182	2379.49	1189.41	16.	6.	0.003	329.14	0.697s
TA-182	2445.00	1222.14	10.	0.	0.000	0.00	0.000s
EU-154	2549.00	1274.11	8.	2.	0.001	723.11	0.000s
FE-59	2582.47	1290.83	8.	4.	0.002	321.46	0.893s
CO-60	2665.04	1332.09	11.	7.	0.004	110.55	0.916s
AG-110M	2765.00	1382.04	3.	6.	0.003	201.98	0.625s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-152	2819.89	1409.47	5.	8.	0.004	175.95	0.512s
K-40	2921.96	1460.47	13.	519.	0.259	13.78	1.769
BI-212	3240.50	1619.63	0.	5.	0.002	134.16	0.999s
BI-214	3530.04	1764.30	0.	24.	0.012	61.24	1.312s
MN-56	3622.00	1810.25	0.	0.	0.000	0.00	0.000s
Y-88	3676.50	1837.48	0.	7.	0.003	113.39	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		2.2262E-02	1460.75	2.226E-02	(	8.467E-04	G
CR-51		1.0334E-04	320.07	1.033E-04	&(	3.338E-04	G
MN-54		7.3134E-05	834.81	7.313E-05	*(	6.624E-05	G
MN-56		0.0000E+00	846.60	0.000E+00	&	6.224E-05	G
			1811.20	0.000E+00	?	1.512E-04	G
FE-59		6.9738E-05	1099.22	6.974E-05	&(	1.354E-04	G
			1291.56	0.000E+00	%	1.476E-04	G
CO-57		0.0000E+00	122.07	0.000E+00	} P	5.330E-05	G
			136.43	0.000E+00	!	4.100E-04	G
CO-58		2.2038E-05	810.75	2.204E-05	&(	5.718E-05	G
CO-60		3.8473E-05	1332.51	2.977E-05	(P	7.688E-05	G
			1173.23	4.719E-05	(P	9.617E-05	G
Cm-243		2.0706E-04	277.60	2.386E-04	(	3.166E-04	G
			117.00	0.000E+00	}	3.618E-04	G
			103.76	8.423E-05	-	2.170E-04	G
			99.55	1.763E-04	(	3.222E-04	G
ZN-65		0.0000E+00	1115.52	0.000E+00	%	1.889E-04	G
Kr-85		0.0000E+00	513.99	0.000E+00	%	1.500E+00	G
Y-88		4.7979E-05	1836.01	3.841E-05	&(P	4.191E-05	G
			898.02	5.810E-05	&(P	8.273E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
NB-94	2.7004E-05	871.10	2.434E-05	&(	6.348E-05	G
		702.50	2.967E-05	&(	5.870E-05	G
Ag-108M	0.0000E+00	722.95	0.000E+00	}	6.921E-05	G
		614.37	0.000E+00	%	7.036E-05	G
		433.93	1.352E-05	?	4.473E-05	G
AG-110M	0.0000E+00	657.75	0.000E+00		5.261E-05	G
		884.67	8.738E-05	&	1.121E-04	G
		937.48	0.000E+00	%	1.224E-04	G
		1384.27	1.019E-04	&	2.018E-04	G
CD-109	7.5581E-04	88.04	7.558E-04	(	1.636E-03	G
SN-113	0.0000E+00	391.71	0.000E+00	& P	8.695E-05	G
		255.04	0.000E+00	&	1.593E-03	G
SB-125	1.2971E-04	427.95	6.748E-05	(	1.443E-04	G
		600.77	0.000E+00	%	2.209E-04	G
		636.15	4.114E-04	}	4.715E-04	G
		463.51	0.000E+00		5.777E-04	G
		176.29	4.221E-04	&(	7.099E-04	G
TE-131	0.0000E+00	149.72	0.000E+00	%	6.461E-05	G
		452.32	0.000E+00	%	1.928E-04	G
		1146.96	0.000E+00	%	1.149E-03	G
		492.66	0.000E+00	%	7.161E-04	G
TE-132	5.0889E-05	228.16	3.453E-05	(	4.035E-05	G
		116.30	0.000E+00	}	1.882E-03	G
		111.76	8.337E-04	&(	1.745E-03	G
J-131	0.0000E+00	364.48	0.000E+00		6.207E-05	G
		636.97	0.000E+00	}	7.501E-04	G
		284.29	0.000E+00	%	4.813E-04	G
CS-134	2.2448E-05	604.66	2.245E-05	(	5.003E-05	G
		795.76	0.000E+00	%	6.535E-05	G
		569.29	0.000E+00	}	2.326E-04	G
		801.84	0.000E+00	&	5.421E-04	G
CS-137	7.1724E-05	661.62	7.172E-05	(	6.783E-05	G
CE-139	0.0000E+00	165.85	0.000E+00	% P	5.663E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
CE-141	3.5769E-05	145.45	3.577E-05	(	8.885E-05	G
CE-144	1.7862E-04	133.53	1.786E-04	(	3.693E-04	G
		80.12	0.000E+00	!	3.192E-03	G
EU-152	0.0000E+00	121.78	0.000E+00	}	1.556E-04	G
		344.30	0.000E+00	%	1.372E-04	G
		1408.08	1.747E-04	&	2.678E-04	G
		964.00	0.000E+00	!	6.123E-04	G
		1112.07	0.000E+00	&	6.720E-04	G
		778.90	0.000E+00	%	2.447E-04	G
EU-154	3.0007E-05	123.10	3.001E-05	?(	7.933E-05	G
		1274.80	0.000E+00	%	1.840E-04	G
		723.30	0.000E+00	}	3.697E-04	G
		1004.80	0.000E+00	%	2.111E-04	G
EU-155	1.6793E-04	86.45	0.000E+00	}	1.729E-04	G
		105.31	1.679E-04	$(	2.028E-04	G
TA-182	9.0504E-05	67.75	9.050E-05	(	1.602E-04	G
		1121.28	0.000E+00	!	3.713E-04	G
		1221.42	0.000E+00	?	2.500E-04	G
		1189.05	0.000E+00	%	4.978E-04	G
HG-203	0.0000E+00	279.17	0.000E+00	% P	5.704E-05	G
		72.87	0.000E+00	!	8.239E-04	G
TL-208	3.3380E-04	583.14	3.338E-04	(	8.383E-05	G
		510.72	5.390E-04	+	2.685E-04	G
PB-212	1.3837E-03	238.63	1.384E-03	(	9.587E-05	G
		77.11	0.000E+00	}	4.001E-04	Energy duplication
		74.81	1.952E-03	}	6.922E-04	G
PB-214	9.2606E-04	351.99	9.336E-04	@(	1.463E-04	G
		295.22	9.116E-04	(	2.442E-04	G
		77.11	2.695E-03	}	6.063E-04	Energy duplication
		241.92	9.261E-04	}	7.115E-04	G
BI-207	0.0000E+00	569.67	0.000E+00	}	6.567E-05	G
		1063.62	0.000E+00	&	1.024E-04	G
		74.97	0.000E+00	}	2.029E-04	G
BI-212	8.1776E-04	727.17	7.948E-04	(	5.396E-04	G
		1620.56	9.162E-04	?(	1.350E-03	G
		785.42	2.441E-03	+	2.737E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-214	9.8776E-04	609.32	1.006E-03	(	1.110E-04		G
		1764.51	8.210E-04	-	2.521E-04		G
		1120.28	9.316E-04	(	6.129E-04		G
RA-224	1.4943E-03	241.00	1.494E-03	}(	2.073E-03		G
RA-226	0.0000E+00	185.99	0.000E+00	}	1.374E-03		G
AC-228	1.2032E-03	911.07	1.191E-03	(	2.883E-04		G
		968.90	1.130E-03	*(	5.379E-04		G
		338.40	1.338E-03	(	4.323E-04		G
TH-227	1.7403E-04	236.00	1.740E-04	(	3.949E-04		G
		256.25	0.000E+00	?	3.707E-04		G
TH-234	7.8814E-04	63.29	7.881E-04	(	2.443E-03		G
		92.80	2.806E-03	}	1.753E-03		G
		92.38	0.000E+00	}	2.510E-03		G
U-235	2.4657E-04	185.72	2.466E-04	}	1.009E-04		G
		143.76	1.478E-04	(	3.608E-04		G
		205.31	0.000E+00	%	9.681E-04		G
		163.35	4.672E-04	(	7.994E-04		G
NP-237	0.0000E+00	86.49	1.644E-04	}	4.082E-04		G
		95.87	0.000E+00	%	1.605E-03		G
AM-241	1.2759E-04	59.54	1.276E-04	(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

- -

***** 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		1.5269E+01	1.5269E+01	2.1040E+00	2.2740E+00
CR-51	#A	7.0875E-02	1.4371E-01	4.0929E-01	4.0937E-01
MN-54	#	5.0160E-02	5.3407E-02	5.7147E-02	5.7227E-02
MN-56	<	4.27E-02	>12 Halflives		
FE-59	#A	4.7831E-02	7.3835E-02	1.5467E-01	1.5473E-01
CO-57	<	2.8123E-01	3.0238E-01		
CO-58	#A	1.5115E-02	1.9932E-02	5.1785E-02	5.1798E-02
CO-60	A	2.6388E-02	2.6658E-02	3.8230E-02	3.8259E-02
Cm-243	A	1.4202E-01	1.4226E-01	1.4835E-01	1.4857E-01
ZN-65	<	1.2955E-01	1.4039E-01		
Kr-85	<	1.0288E+03	1.0291E+03		
Y-88	#	3.2908E-02	3.9543E-02	4.0945E-02	4.1006E-02
NB-94	A	1.8521E-02	1.8521E-02	3.0698E-02	3.0716E-02
Ag-108M	<	4.8255E-02	4.8275E-02		
AG-110M	<	3.6081E-02	3.9022E-02		
CD-109	A	5.1839E-01	5.4127E-01	1.0645E+00	1.0649E+00
SN-113	<	5.9633E-02	7.0692E-02		
SB-125	A	8.8966E-02	9.0704E-02	1.2036E-01	1.2047E-01
TE-131	<	4.43E-02	>12 Halflives		
TE-132		3.4903E-02	1.4542E+01	2.0217E+01	2.0233E+01
J-131	<	4.2572E-02	4.8618E-01		
CS-134	A	1.5396E-02	1.5802E-02	3.1904E-02	3.1917E-02
CS-137		4.9193E-02	4.9281E-02	5.2270E-02	5.2344E-02
CE-139	<	3.8838E-02	4.4782E-02		
CE-141	A	2.4533E-02	4.4913E-02	1.0084E-01	1.0087E-01
CE-144	A	1.2251E-01	1.3125E-01	3.4176E-01	3.4183E-01
EU-152	<	9.4129E-02	9.4527E-02		
EU-154	A	2.0581E-02	2.0711E-02	5.9496E-02	5.9507E-02
EU-155	A	1.1518E-01	1.1643E-01	1.3144E-01	1.3160E-01
TA-182	A	6.2074E-02	7.3596E-02	1.6495E-01	1.6500E-01
HG-203	<	3.9119E-02	5.9554E-02		
TL-208		2.2895E-01	>12 Halflives	8.2653E-02	8.3659E-02
PB-212		9.4905E-01	>12 Halflives	1.2240E-01	1.3363E-01
PB-214		6.3516E-01	>12 Halflives	1.3578E-01	1.4044E-01
BI-207	<	7.0265E-02	7.0364E-02		

BI-212		5.6088E-01	>12 Halflives	4.1361E-01	4.1482E-01
BI-214		6.7747E-01	>12 Halflives	1.4975E-01	1.5456E-01
RA-224	#	1.0249E+00	2.1583E+02	2.0199E+05	1.6383E+02
AC-228		8.2522E-01	>12 Halflives	2.3348E-01	2.3809E-01
TH-227	A	1.1936E-01	3.4398E-01	7.0724E-01	7.0750E-01
TH-234	A	5.4057E-01	1.2181E+00	3.3982E+00	3.3989E+00
U-235	A	1.6912E-01	1.6912E-01	2.2909E-01	2.2928E-01
NP-237	<	1.1006E+00	1.1006E+00		
AM-241	A	8.7511E-02	8.7522E-02	1.9070E-01	1.9076E-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) 1.8665791E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 2.4905923E+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_11JAN2005_1615.An1

Sample description
Detector 101 FSS-OOL-14-01-021-FB SOIL

Spectrum Filename: C:\GammaVision\Spectra\101F_11JAN2005_1615.An1

Acquisition information
Start time: 11-Jan-2005 16:07:06
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: 1.1550E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.1550E+03) =
8.6580E+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_11JAN2005_1615.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	14-Dec-2004 10:40:00
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: 0.1612

********** 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	
167.84	84.16	209.	42.	0.021	154.27	1.012	TA-182	D
173.75	87.11	202.	103.	0.051	65.77	1.014	PB-214	D
179.38	89.93	195.	75.	0.037	86.53	1.016	PB-214	D
418.52	209.12	102.	52.	0.026	92.30	1.101	AC-228	D
600.23	300.24	47.	33.	0.017	107.33	1.163	PB-212	
1929.51	964.68	12.	29.	0.015	74.52	1.613	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	165.	29.	0.014	195.49	0.994D
TH-234	126.14	63.29	151.	27.	0.013	202.89	0.996D
TA-182	134.78	67.61	161.	42.	0.021	197.76	1.295s
HG-203	145.31	72.87	201.	0.	0.000	0.00	0.518D
PB-212	149.19	74.81	312.	120.	0.060	68.11	1.005D
BI-207	149.51	74.97	370.	62.	0.031	137.71	1.005D
PB-214	153.79	77.11	265.	280.	0.140	30.44	1.006D
PB-212	153.79	77.11	192.	0.	0.000	41.18	0.883D
CE-144	159.81	80.12	186.	0.	0.000	0.00	0.716D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-155	172.48	86.45	302.	0.	0.000	0.00	1.013D
NP-237	172.56	86.49	302.	0.	0.000	0.00	1.013D
CD-109	175.66	88.04	266.	21.	0.010	338.74	1.014D
TH-234	184.34	92.38	273.	0.	0.000	0.00	1.017D
TH-234	185.18	92.80	189.	97.	0.048	67.58	1.018D
NP-237	191.32	95.87	182.	2.	0.001	3612.64	1.020D
Cm-243	198.69	99.55	80.	0.	0.000	0.00	1.016D
Cm-243	207.11	103.76	66.	0.	0.000	0.00	0.000D
EU-155	210.21	105.31	166.	35.	0.017	165.81	1.027D
TE-132	222.60	111.50	136.	30.	0.015	249.76	1.357s
TE-132	232.20	116.30	209.	0.	0.000	0.00	2.900D
Cm-243	232.07	116.24	190.	79.	0.040	132.59	2.911s
EU-152	243.48	121.94	95.	0.	0.000	0.00	1.039
CO-57	244.33	122.36	74.	21.	0.011	221.61	1.000
EU-154	246.12	123.26	111.	0.	0.000	0.00	1.040
CE-144	266.67	133.53	91.	9.	0.005	436.01	1.047D
CO-57	272.48	136.43	99.	5.	0.003	788.45	1.049D
U-235	285.52	142.95	180.	53.	0.026	190.53	0.967s
CE-141	291.10	145.74	163.	0.	0.000	0.00	1.056
TE-131	299.64	150.01	144.	0.	0.000	0.00	1.059
U-235	326.34	163.35	69.	19.	0.009	202.10	1.068D
CE-139	331.34	165.85	75.	4.	0.002	883.00	1.070D
SB-125	352.73	176.54	65.	26.	0.013	183.71	0.639s
U-235	371.10	185.72	159.	229.	0.115	5.63	1.084A
RA-226	371.64	185.99	112.	0.	0.000	4500.00	1.210A
U-235	410.29	205.31	62.	18.	0.009	194.86	1.098D
TE-132	459.03	229.67	130.	20.	0.010	303.73	0.411s
TH-227	471.70	236.00	102.	25.	0.013	180.89	1.120D
PB-212	476.96	238.63	72.	558.	0.279	14.25	1.122D
RA-224	481.70	241.00	100.	44.	0.022	107.09	1.583A
PB-214	483.54	241.92	117.	64.	0.032	11.37	1.124A
SN-113	509.79	255.04	42.	0.	0.000	0.00	0.702D
TH-227	514.00	257.14	21.	9.	0.004	261.41	0.250s
Cm-243	554.93	277.60	72.	28.	0.014	140.76	1.149D
HG-203	558.07	279.17	101.	2.	0.001	604.64	1.150D
J-131	567.59	283.93	38.	18.	0.009	236.76	0.652s
PB-214	590.34	295.30	94.	141.	0.071	43.76	1.097
CR-51	640.00	320.12	18.	0.	0.000	1594.52	0.000s
AC-228	676.37	338.29	43.	127.	0.063	36.86	1.021
EU-152	687.69	343.95	41.	12.	0.006	267.37	0.524s
PB-214	703.60	351.90	76.	222.	0.111	28.67	1.234
J-131	727.64	363.92	39.	11.	0.005	284.08	0.514s
SN-113	782.00	391.08	18.	1.	0.001	737.34	0.000s
SB-125	856.45	428.29	38.	11.	0.005	298.83	0.537s
Ag-108M	866.72	433.43	14.	2.	0.001	754.98	0.520s
TE-131	900.38	450.25	24.	8.	0.004	309.23	0.400s
SB-125	925.45	462.78	24.	31.	0.015	90.26	1.440
TE-131	987.35	493.71	20.	8.	0.004	300.00	0.460s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TL-208	1021.38	510.72	31.	68.	0.034	50.25	1.311D
Kr-85	1027.92	513.99	41.	7.	0.003	429.45	1.313D
CS-134	1138.58	569.29	13.	0.	0.000	0.00	1.350
BI-207	1136.00	568.00	12.	1.	0.001	1072.53	0.460s
TL-208	1165.98	582.99	28.	147.	0.073	30.49	1.095
SB-125	1201.37	600.67	18.	0.	0.000	0.00	1.372
CS-134	1209.15	604.56	29.	0.	0.000	0.00	1.374
BI-214	1218.38	609.17	30.	147.	0.073	30.75	1.557
Ag-108M	1228.78	614.37	6.	0.	0.000	0.00	0.000D
SB-125	1272.36	636.15	28.	0.	0.000	10982.89	1.396D
J-131	1274.00	636.97	22.	8.	0.004	261.72	1.396D
AG-110M	1315.58	657.75	23.	9.	0.004	258.55	1.410D
CS-137	1323.33	661.62	25.	86.	0.043	40.64	1.413D
NB-94	1405.43	702.65	7.	2.	0.001	490.52	1.055
Ag-108M	1446.05	722.95	18.	5.	0.003	374.16	1.454D
EU-154	1446.75	723.30	8.	0.	0.000	0.00	1.333D
BI-212	1454.49	727.17	13.	33.	0.016	70.81	1.457D
EU-152	1558.00	778.90	2.	0.	0.000	0.00	0.000s
BI-212	1570.50	785.14	12.	18.	0.009	115.47	1.199
CS-134	1591.75	795.76	17.	0.	0.000	0.00	1.022D
CS-134	1604.00	801.88	5.	0.	0.000	0.00	0.000s
CO-58	1622.65	811.20	10.	20.	0.010	111.24	0.854s
MN-54	1670.93	835.33	18.	6.	0.003	387.30	0.409s
MN-56	1693.00	846.36	3.	1.	0.000	748.33	0.000s
NB-94	1743.33	871.51	8.	2.	0.001	636.40	0.814s
AG-110M	1769.00	884.34	4.	0.	0.000	0.00	0.000s
Y-88	1797.00	898.33	4.	0.	0.000	0.00	0.000s
AC-228	1822.71	911.18	9.	93.	0.047	35.32	1.739s
AG-110M	1875.00	937.31	6.	1.	0.001	1081.67	0.000s
EU-152	1928.41	964.00	13.	0.	0.000	0.00	0.876D
AC-228	1938.21	968.90	25.	38.	0.019	73.56	1.616D
EU-154	2010.50	1005.02	6.	6.	0.003	229.13	0.583s
BI-207	2129.53	1064.50	10.	6.	0.003	249.62	0.875s
FE-59	2198.70	1099.07	25.	27.	0.013	129.36	1.006s
EU-152	2224.72	1112.07	10.	0.	0.000	0.00	1.708D
ZN-65	2231.62	1115.52	16.	6.	0.003	312.93	1.710D
BI-214	2241.15	1120.28	32.	26.	0.013	109.17	1.713D
TA-182	2243.15	1121.28	48.	12.	0.006	270.03	1.713D
TE-131	2292.80	1146.09	7.	5.	0.002	269.44	0.562s
CO-60	2348.10	1173.73	24.	3.	0.001	249.35	0.999s
TA-182	2378.60	1188.96	2.	0.	0.000	497.49	0.699s
TA-182	2442.45	1220.87	22.	28.	0.014	104.25	0.743s
EU-154	2548.87	1274.05	12.	12.	0.006	193.91	1.280
FE-59	2584.00	1291.60	1.	0.	0.000	0.00	0.000s
CO-60	2662.90	1331.02	8.	10.	0.005	87.95	0.645s
AG-110M	2772.75	1385.92	5.	9.	0.005	160.36	0.555s
EU-152	2817.67	1408.36	0.	12.	0.006	86.60	1.499
K-40	2921.91	1460.45	6.	366.	0.183	16.13	1.942

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	3242.00	1620.38	3.	0.	0.000	768.11	0.000s
BI-214	3529.82	1764.19	0.	33.	0.016	52.22	1.386s
MN-56	3625.50	1812.00	0.	2.	0.001	212.13	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		1.5724E-02	1460.75	1.572E-02	(	5.924E-04	G
CR-51		0.0000E+00	320.07	0.000E+00	%	2.612E-04	G
MN-54		0.0000E+00	834.81	0.000E+00	%	6.323E-05	G
MN-56		0.0000E+00	846.60	0.000E+00	%	3.227E-05	G
			1811.20	4.103E-05	?	1.512E-04	G
FE-59		1.6906E-04	1099.22	1.691E-04	*(	1.659E-04	G
			1291.56	0.000E+00	?	7.032E-05	G
CO-57		0.0000E+00	122.07	1.581E-05	} P	3.191E-05	G
			136.43	0.000E+00	%	2.981E-04	G
CO-58		5.5095E-05	810.75	5.509E-05	*(	4.806E-05	G
CO-60		4.0362E-05	1332.51	4.036E-05	&(P	6.895E-05	G
			1173.23	0.000E+00	% P	9.738E-05	G
Cm-243		1.9788E-04	277.60	1.979E-04	(	2.992E-04	G
			117.00	4.678E-04	}	3.964E-04	G
			103.76	0.000E+00	&	1.152E-04	G
			99.55	0.000E+00	!	2.051E-04	G
ZN-65		0.0000E+00	1115.52	0.000E+00	%	1.530E-04	G
Kr-85		0.0000E+00	513.99	0.000E+00	%	1.362E+00	G
Y-88		0.0000E+00	1836.01	0.000E+00	% P	4.191E-05	G
			898.02	0.000E+00	? P	3.765E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
NB-94	0.0000E+00	871.10	0.000E+00	%	4.641E-05	G
		702.50	0.000E+00	%	3.546E-05	G
Ag-108M	0.0000E+00	722.95	0.000E+00	}	6.116E-05	G
		614.37	0.000E+00	?	3.319E-05	G
		433.93	0.000E+00	%	3.404E-05	G
AG-110M	5.0736E-05	657.75	2.063E-05	(	6.030E-05	G
		884.67	0.000E+00	?	4.889E-05	G
		937.48	0.000E+00	%	1.283E-04	G
		1384.27	1.679E-04	&(	2.298E-04	G
CD-109	0.0000E+00	88.04	0.000E+00	%	1.453E-03	G
SN-113	0.0000E+00	391.71	0.000E+00	& P	4.796E-05	G
		255.04	0.000E+00	&	1.458E-03	G
SB-125	1.8422E-04	427.95	5.399E-05	@(	1.597E-04	G
		600.77	0.000E+00	%	2.518E-04	G
		636.15	0.000E+00	}	5.344E-04	G
		463.51	5.022E-04	&(	4.137E-04	G
		176.29	2.914E-04	(	4.514E-04	G
TE-131	0.0000E+00	149.72	0.000E+00		5.613E-05	G
		452.32	0.000E+00	&	2.217E-04	G
		1146.96	3.746E-04	&	1.127E-03	G
		492.66	0.000E+00	&	8.277E-04	G
TE-132	0.0000E+00	228.16	0.000E+00	&	5.282E-05	G
		116.30	0.000E+00	}	2.300E-03	G
		111.76	1.059E-03	*	1.985E-03	G
J-131	3.6376E-05	364.48	1.733E-05	*(	5.011E-05	G
		636.97	2.493E-04	}	7.389E-04	G
		284.29	2.918E-04	(	5.274E-04	G
CS-134	0.0000E+00	604.66	0.000E+00		5.960E-05	G
		795.76	0.000E+00	&	6.975E-05	G
		569.29	0.000E+00	}	2.499E-04	G
		801.84	0.000E+00	?	4.080E-04	G
CS-137	2.3150E-04	661.62	2.315E-04	(	6.987E-05	G
CE-139	0.0000E+00	165.85	0.000E+00	% P	3.688E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
CE-141	0.0000E+00	145.45	0.000E+00		8.478E-05	G
CE-144	0.0000E+00	133.53	0.000E+00	%	2.801E-04	G
		80.12	0.000E+00	!	3.116E-03	G
EU-152	1.3997E-04	121.78	0.000E+00	}	1.052E-04	G
		344.30	5.232E-05	(	1.465E-04	G
		1408.08	2.515E-04	$(	1.545E-04	G
		964.00	0.000E+00	?	4.251E-04	G
		1112.07	0.000E+00	%	4.626E-04	G
		778.90	0.000E+00	?	1.892E-04	G
EU-154	0.0000E+00	123.10	0.000E+00		8.182E-05	G
		1274.80	1.320E-04	$	2.202E-04	G
		723.30	0.000E+00	}	1.940E-04	G
		1004.80	1.129E-04	$	2.658E-04	G
EU-155	1.0334E-04	86.45	0.000E+00	}	1.809E-04	G
		105.31	1.033E-04	$(	1.872E-04	G
TA-182	1.8777E-04	67.75	1.000E-04	*(	1.473E-04	G
		1121.28	1.205E-04	(	3.659E-04	G
		1221.42	4.060E-04	*(	3.496E-04	G
		1189.05	0.000E+00	%	1.963E-04	G
HG-203	0.0000E+00	279.17	0.000E+00	% P	6.043E-05	G
		72.87	0.000E+00	&	9.136E-04	G
TL-208	3.4477E-04	583.14	3.448E-04	(	6.468E-05	G
		510.72	5.385E-04	+	2.265E-04	G
PB-212	1.1232E-03	238.63	1.123E-03	(	8.506E-05	G
		77.11	0.000E+00	}	3.024E-04	Energy duplication
		74.81	1.022E-03	}	7.234E-04	G
PB-214	7.4971E-04	351.99	7.402E-04	(	1.445E-04	G
		295.22	7.681E-04	(	2.609E-04	G
		77.11	2.058E-03	}	5.764E-04	Energy duplication
		241.92	7.497E-04	}	6.248E-04	G
BI-207	2.9383E-05	569.67	0.000E+00	}	3.758E-05	G
		1063.62	2.938E-05	&(	8.051E-05	G
		74.97	1.302E-04	}	1.950E-04	G
BI-212	6.8418E-04	727.17	6.842E-04	(	4.132E-04	G
		1620.56	0.000E+00	%	1.891E-03	G
		785.42	2.396E-03	+	2.510E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-214	6.6200E-04	609.32	6.721E-04	(	1.291E-04		G
		1764.51	1.129E-03	+	2.521E-04		G
		1120.28	6.310E-04	(	7.033E-04		G
RA-224	9.8092E-04	241.00	9.809E-04	}(	1.858E-03		G
RA-226	0.0000E+00	185.99	0.000E+00	}	1.156E-03		G
AC-228	1.0594E-03	911.07	9.781E-04	(	1.722E-04		G
		968.90	7.021E-04	-	4.761E-04		G
		338.40	1.256E-03	(	3.310E-04		G
TH-227	1.6593E-04	236.00	1.926E-04	(	3.820E-04		G
		256.25	1.219E-04	&(	3.260E-04		G
TH-234	8.3044E-04	63.29	8.304E-04	(	1.857E-03		G
		92.80	2.188E-03	}	1.510E-03		G
		92.38	0.000E+00	}	2.111E-03		G
U-235	3.0877E-04	185.72	3.088E-04	}	8.271E-05		G
		143.76	3.292E-04	&(	4.052E-04		G
		205.31	3.020E-04	(	6.477E-04		G
		163.35	2.698E-04	(	6.016E-04		G
NP-237	0.0000E+00	86.49	0.000E+00	}	4.520E-04		G
		95.87	0.000E+00	%	1.482E-03		G
AM-241	1.2553E-04	59.54	1.255E-04	(P	2.727E-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		1.3613E+01	1.3613E+01	2.1961E+00	2.3270E+00
CR-51	<	2.2619E-01	4.5839E-01		
MN-54	<	5.4749E-02	5.8289E-02		
MN-56	<	2.79E-02	>12 Halflives		
FE-59	#	1.4637E-01	2.2588E-01	2.9220E-01	2.9248E-01
CO-57	<	2.5811E-01	2.7751E-01		
CO-58	#	4.7701E-02	6.2889E-02	6.9960E-02	7.0050E-02
CO-60	A	3.4946E-02	3.5302E-02	5.2143E-02	5.2181E-02
Cm-243	A	1.7132E-01	1.7161E-01	2.4156E-01	2.4175E-01
ZN-65	<	1.3245E-01	1.4352E-01		
Kr-85	<	1.1792E+03	1.1794E+03		
Y-88	<	3.6289E-02	4.3600E-02		
NB-94	<	4.0184E-02	4.0184E-02		
Ag-108M	<	2.8732E-02	2.8744E-02		
AG-110M	A	4.3928E-02	4.7505E-02	7.2265E-02	7.2315E-02
CD-109	<	1.2579E+00	1.3133E+00		
SN-113	<	4.1520E-02	4.9213E-02		
SB-125	C	1.5950E-01	1.6261E-01	1.4678E-01	1.4707E-01
TE-131	<	4.86E-02	>12 Halflives		
TE-132	<	4.5733E-02	1.8966E+01		
J-131	A	3.1494E-02	3.5901E-01	6.6382E-01	6.6413E-01
CS-134	<	5.1603E-02	5.2961E-02		
CS-137		2.0044E-01	2.0079E-01	8.1595E-02	8.2380E-02
CE-139	<	3.1935E-02	3.6818E-02		
CE-141	<	7.3406E-02	1.3432E-01		
CE-144	<	2.4251E-01	2.5979E-01		
EU-152	A	1.2118E-01	1.2170E-01	1.0539E-01	1.0562E-01
EU-154	<	7.0838E-02	7.1286E-02		
EU-155	A	8.9473E-02	9.0445E-02	1.4997E-01	1.5005E-01
TA-182		1.6257E-01	1.9272E-01	2.0091E-01	2.0120E-01
HG-203	<	5.2320E-02	7.9625E-02		
TL-208		2.9851E-01	>12 Halflives	9.1020E-02	9.2569E-02
PB-212		9.7244E-01	>12 Halflives	1.3853E-01	1.4903E-01
PB-214		6.4910E-01	>12 Halflives	1.6978E-01	1.7370E-01
BI-207	A	2.5440E-02	2.5476E-02	6.3591E-02	6.3607E-02

BI-212		5.9237E-01	>12 Halflives	4.1948E-01	4.2082E-01
BI-214		5.7316E-01	>12 Halflives	1.7623E-01	1.7919E-01
RA-224	#	8.4928E-01	1.7811E+02	2.4435E+05	1.9101E+02
AC-228		9.1725E-01	>12 Halflives	2.3415E-01	2.3981E-01
TH-227	A	1.4366E-01	4.1366E-01	6.5749E-01	6.5790E-01
TH-234	A	7.1899E-01	1.6192E+00	3.2852E+00	3.2865E+00
U-235	A	2.6733E-01	2.6733E-01	3.0234E-01	3.0270E-01
NP-237	<	1.2828E+00	1.2828E+00		
AM-241	A	1.0869E-01	1.0870E-01	2.1441E-01	2.1449E-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) 1.6935755E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 1.9583067E+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_11JAN2005_1730.An1

Sample description
Detector 101 FSS-OOL-14-01-022-I SOIL

Spectrum Filename: C:\GammaVision\Spectra\101F_11JAN2005_1730.An1

Acquisition information
Start time: 11-Jan-2005 17:20:42
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: 1.4920E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4920E+03) =
6.7024E+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_11JAN2005_1730.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	14-Dec-2004 10:54:00
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: 0.1545

********** 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	
120.81	60.71	218.	56.	0.028	119.18	0.995	AM-241	D
133.32	66.96	279.	58.	0.029	127.69	0.999	CS-136	D
174.12	87.10	350.	105.	0.052	81.35	1.014	PB-214	D
179.43	89.76	312.	102.	0.051	79.41	1.016	PB-214	D
257.45	128.92	198.	75.	0.038	117.78	1.222	AC-228	
418.28	209.58	159.	68.	0.034	86.78	1.101	NP-239	D
442.89	221.60	72.	42.	0.021	124.21	1.408	RH-106M	s
540.04	270.16	115.	79.	0.040	105.31	0.845	AC-228	
600.19	300.14	89.	67.	0.033	70.30	1.165	PB-212	D
654.92	327.57	64.	49.	0.024	117.61	1.390	AC-228	
925.76	462.93	60.	60.	0.030	75.51	0.706	AC-228	s
1535.38	767.59	30.	37.	0.019	87.70	0.582	BI-214	sM

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	179.	1.	0.001	4439.98	0.994D
TH-234	126.14	63.29	272.	62.	0.031	119.20	0.996D
TA-182	135.06	67.75	252.	8.	0.004	808.97	1.000D
HG-203	145.31	72.87	322.	48.	0.024	164.77	1.003D
PB-212	149.19	74.81	333.	288.	0.144	32.16	1.005D
BI-207	149.51	74.97	446.	0.	0.000	0.00	0.000D
PB-214	153.79	77.11	331.	433.	0.216	22.95	1.006D
PB-212	153.79	77.11	515.	0.	0.000	248.45	0.448D
CE-144	159.81	80.12	278.	43.	0.021	171.90	1.009D
EU-155	172.48	86.45	335.	32.	0.016	252.15	1.013D
NP-237	172.56	86.49	367.	0.	0.000	0.00	1.013D
CD-109	175.66	88.04	464.	0.	0.000	0.00	1.014D
TH-234	184.34	92.38	403.	0.	0.000	0.00	1.018D
TH-234	185.18	92.80	299.	105.	0.053	75.53	1.018D
NP-237	191.32	95.87	287.	0.	0.000	0.00	1.020D
Cm-243	198.69	99.55	272.	26.	0.013	274.37	1.023D
Cm-243	207.11	103.76	262.	13.	0.007	515.52	1.026D
EU-155	210.21	105.31	272.	3.	0.002	2093.82	1.027D
TE-132	224.36	112.38	203.	58.	0.029	161.22	2.017s
TE-132	232.20	116.30	101.	0.	0.000	0.00	0.122D
Cm-243	236.08	118.24	243.	75.	0.038	150.28	1.000s
EU-152	243.62	122.01	216.	0.	0.000	0.00	1.039
CO-57	243.74	122.07	217.	0.	0.000	0.00	1.039D
EU-154	247.16	123.77	189.	43.	0.022	208.55	0.687s
CE-144	266.67	133.53	259.	25.	0.012	282.41	1.047D
CO-57	272.48	136.43	220.	1.	0.000	8749.97	1.049D
U-235	287.14	143.76	194.	29.	0.014	213.42	1.054D
CE-141	290.52	145.45	245.	7.	0.003	956.68	1.055D
TE-131	299.07	149.72	245.	16.	0.008	419.18	1.058D
U-235	326.34	163.35	203.	11.	0.005	574.23	1.068D
CE-139	331.34	165.85	188.	27.	0.013	223.04	1.070D
SB-125	354.39	177.37	176.	59.	0.030	155.81	1.316s
U-235	371.10	185.72	319.	133.	0.066	10.62	1.084A
RA-226	371.64	185.99	207.	0.	0.000	6104.10	1.443A
U-235	410.29	205.31	192.	20.	0.010	302.45	1.098D
TE-132	453.41	226.86	135.	32.	0.016	260.90	2.614s
TH-227	471.70	236.00	158.	16.	0.008	350.42	1.120D
PB-212	476.96	238.63	102.	784.	0.392	12.03	1.122D
RA-224	481.70	241.00	166.	100.	0.050	62.44	1.977A
PB-214	483.54	241.92	204.	95.	0.047	7.71	1.124A
SN-113	509.79	255.04	38.	0.	0.000	0.00	0.000D
TH-227	512.61	256.45	66.	28.	0.014	190.57	0.524s
Cm-243	554.93	277.60	68.	47.	0.024	85.33	1.149D
HG-203	558.07	279.17	128.	19.	0.009	207.03	1.150D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
J-131	568.67	284.46	60.	30.	0.015	181.66	0.670s
PB-214	590.19	295.22	101.	205.	0.103	29.49	1.161D
CR-51	643.22	321.73	50.	44.	0.022	129.02	1.133s
AC-228	676.52	338.37	76.	138.	0.069	38.60	1.124
EU-152	687.00	343.61	19.	0.	0.000	0.00	0.117s
PB-214	703.61	351.91	58.	332.	0.166	19.74	1.305
J-131	728.80	364.50	37.	9.	0.004	303.68	0.639s
SN-113	779.00	389.59	48.	0.	0.000	0.00	0.214s
SB-125	856.00	428.07	28.	2.	0.001	1046.42	0.000s
Ag-108M	866.59	433.36	38.	18.	0.009	236.76	0.620s
TE-131	905.24	452.68	30.	8.	0.004	335.22	0.444s
SB-125	926.92	463.51	60.	0.	0.000	0.00	0.706D
TE-131	984.04	492.06	28.	1.	0.001	2264.95	0.392s
TL-208	1021.38	510.72	49.	62.	0.031	61.26	1.311D
Kr-85	1027.92	513.99	49.	3.	0.001	1128.20	1.313D
CS-134	1138.44	569.22	31.	0.	0.000	0.00	1.350
BI-207	1139.12	569.56	32.	6.	0.003	468.42	0.829s
TL-208	1166.26	583.13	46.	198.	0.099	27.77	1.208
SB-125	1201.57	600.77	22.	0.	0.000	0.00	0.741D
CS-134	1209.35	604.66	39.	2.	0.001	1172.96	1.374D
BI-214	1218.68	609.32	33.	223.	0.112	22.86	1.378D
Ag-108M	1228.78	614.37	26.	0.	0.000	0.00	0.180D
SB-125	1271.24	635.59	11.	4.	0.002	352.93	0.704s
J-131	1273.55	636.74	21.	0.	0.000	0.00	1.396
AG-110M	1315.58	657.75	9.	5.	0.003	275.39	1.410D
CS-137	1323.33	661.62	22.	46.	0.023	62.71	1.413D
NB-94	1406.52	703.19	19.	11.	0.005	190.91	0.969
Ag-108M	1446.21	723.03	22.	0.	0.000	0.00	1.454
EU-154	1446.75	723.30	8.	0.	0.000	0.00	0.583D
BI-212	1454.16	727.00	32.	56.	0.028	70.32	1.597s
EU-152	1557.67	778.73	11.	6.	0.003	264.58	0.790s
BI-212	1572.49	786.14	20.	19.	0.009	140.34	1.187s
CS-134	1591.75	795.76	45.	18.	0.009	170.08	1.502D
CS-134	1603.91	801.84	22.	3.	0.001	814.19	1.506D
CO-58	1622.00	810.88	5.	0.	0.000	0.00	0.000s
MN-54	1670.76	835.25	14.	14.	0.007	143.71	1.132
MN-56	1689.78	844.75	24.	15.	0.008	179.87	0.472s
NB-94	1743.00	871.35	5.	0.	0.000	0.00	0.000s
AG-110M	1769.55	884.62	10.	6.	0.003	249.62	0.501s
Y-88	1798.00	898.83	8.	5.	0.003	230.04	1.249
AC-228	1822.30	910.97	32.	120.	0.060	38.10	1.443
AG-110M	1873.61	936.62	5.	2.	0.001	408.83	0.716s
EU-152	1928.41	964.00	37.	0.	0.000	0.00	0.952D
AC-228	1938.11	968.85	40.	82.	0.041	55.32	1.818s
EU-154	2009.60	1004.57	2.	0.	0.000	497.49	0.700s
BI-207	2129.11	1064.29	20.	16.	0.008	160.83	0.587s
FE-59	2199.00	1099.22	6.	0.	0.000	0.00	0.000s
EU-152	2224.72	1112.07	13.	0.	0.000	0.00	0.759D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
ZN-65	2231.62	1115.52	18.	5.	0.003	375.90	1.709D
BI-214	2241.15	1120.28	34.	44.	0.022	71.65	1.713D
TA-182	2243.15	1121.28	58.	9.	0.004	381.27	1.713D
TE-131	2291.40	1145.39	16.	11.	0.005	189.61	0.646s
CO-60	2348.55	1173.95	37.	10.	0.005	191.11	1.596
TA-182	2379.17	1189.25	14.	2.	0.001	821.58	0.539s
TA-182	2443.59	1221.44	36.	32.	0.016	124.37	0.675s
EU-154	2548.10	1273.66	16.	14.	0.007	181.16	0.584s
FE-59	2581.40	1290.30	8.	14.	0.007	132.09	1.811
CO-60	2664.38	1331.77	14.	9.	0.005	115.60	0.666s
AG-110M	2768.00	1383.54	2.	0.	0.000	497.49	0.143s
EU-152	2817.04	1408.05	3.	8.	0.004	159.22	0.666s
K-40	2921.79	1460.39	19.	575.	0.287	13.34	1.814
BI-212	3242.71	1620.74	4.	6.	0.003	193.70	0.833s
BI-214	3529.78	1764.17	3.	32.	0.016	64.33	1.557
MN-56	3622.00	1810.25	0.	0.	0.000	0.00	0.000s
Y-88	3676.50	1837.48	0.	5.	0.002	134.16	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 microCi	Peak Energy keV	Peak Activity microCi	Peak Code	Peak MDA Value microCi	Comments
K-40		2.4680E-02	1460.75	2.468E-02	(	9.882E-04	G
CR-51		5.1094E-04	320.07	5.109E-04	&(	4.076E-04	G
MN-54		4.0786E-05	834.81	4.079E-05	?(	5.578E-05	G
MN-56		4.3625E-05	846.60	4.363E-05	&(	7.323E-05	G
			1811.20	0.000E+00	?	1.512E-04	G
FE-59		0.0000E+00	1099.22	0.000E+00	?	8.955E-05	G
			1291.56	1.336E-04	&	1.516E-04	G
CO-57		0.0000E+00	122.07	0.000E+00	} P	5.330E-05	G
			136.43	0.000E+00	%	4.367E-04	G
CO-58		0.0000E+00	810.75	0.000E+00	?	3.617E-05	G
CO-60		3.8950E-05	1332.51	3.895E-05	(P	8.484E-05	G
			1173.23	0.000E+00	% P	1.182E-04	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Cm-243	3.3619E-04	277.60	3.362E-04	(	2.902E-04		G
		117.00	4.441E-04	}	4.462E-04		G
		103.76	0.000E+00	%	2.216E-04		G
		99.55	1.206E-04	-	3.676E-04		G
ZN-65	0.0000E+00	1115.52	0.000E+00	%	1.603E-04		G
Kr-85	0.0000E+00	513.99	0.000E+00	%	1.476E+00		G
Y-88	2.1961E-05	1836.01	2.703E-05	&(P	4.191E-05		G
		898.02	1.660E-05	&(P	5.020E-05		G
NB-94	0.0000E+00	871.10	0.000E+00	?	3.835E-05		G
		702.50	2.646E-05	?	5.538E-05		G
Ag-108M	0.0000E+00	722.95	0.000E+00	}	6.702E-05		G
		614.37	0.000E+00	&	6.165E-05		G
		433.93	2.957E-05	$	5.343E-05		G
AG-110M	1.8611E-05	657.75	1.261E-05	(	4.005E-05		G
		884.67	2.642E-05	?(	7.238E-05		G
		937.48	0.000E+00	&	1.161E-04		G
		1384.27	0.000E+00	%	1.514E-04		G
CD-109	0.0000E+00	88.04	0.000E+00	!	1.902E-03		G
SN-113	0.0000E+00	391.71	0.000E+00	& P	7.504E-05		G
		255.04	0.000E+00	&	1.393E-03		G
SB-125	0.0000E+00	427.95	0.000E+00	%	1.385E-04		G
		600.77	0.000E+00	&	2.804E-04		G
		636.15	0.000E+00	}	3.536E-04		G
		463.51	0.000E+00	!	6.311E-04		G
		176.29	6.612E-04	&	7.232E-04		G
TE-131	0.0000E+00	149.72	0.000E+00	%	7.241E-05		G
		452.32	0.000E+00	%	2.463E-04		G
		1146.96	8.242E-04	&	1.600E-03		G
		492.66	0.000E+00	%	9.728E-04		G
TE-132	7.0903E-05	228.16	3.027E-05	&(	5.378E-05		G
		116.30	0.000E+00	}	1.626E-03		G
		111.76	2.015E-03	&(	2.400E-03		G
J-131	0.0000E+00	364.48	0.000E+00	%	4.892E-05		G
		636.97	0.000E+00	}	7.274E-04		G
		284.29	5.003E-04	*	6.471E-04		G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-134	0.0000E+00	604.66	0.000E+00	%		6.790E-05	G
		795.76	5.774E-05			1.068E-04	G
		569.29	0.000E+00	}		3.670E-04	G
		801.84	0.000E+00	%		7.640E-04	G
CS-137	1.2240E-04	661.62	1.224E-04	(		6.673E-05	G
CE-139	2.2986E-05	165.85	2.299E-05	(P		5.702E-05	G
CE-141	0.0000E+00	145.45	0.000E+00	%		1.031E-04	G
CE-144	3.8797E-04	133.53	1.474E-04	(		4.629E-04	G
		80.12	2.012E-03	(		3.788E-03	G
EU-152	0.0000E+00	121.78	0.000E+00	}		1.556E-04	G
		344.30	0.000E+00	&		1.032E-04	G
		1408.08	1.607E-04	$		2.352E-04	G
		964.00	0.000E+00	?		6.789E-04	G
		1112.07	0.000E+00	%		5.170E-04	G
		778.90	1.221E-04	?		3.695E-04	G
EU-154	1.0949E-04	123.10	6.791E-05	&(		1.055E-04	G
		1274.80	1.569E-04	&(		2.473E-04	G
		723.30	0.000E+00	}		1.993E-04	G
		1004.80	0.000E+00	%		1.584E-04	G
EU-155	0.0000E+00	86.45	6.816E-05	}		1.903E-04	G
		105.31	0.000E+00	%		2.370E-04	G
TA-182	0.0000E+00	67.75	0.000E+00	%		1.825E-04	G
		1121.28	0.000E+00	%		3.984E-04	G
		1221.42	4.585E-04	*		4.395E-04	G
		1189.05	0.000E+00	%		4.697E-04	G
HG-203	6.7486E-05	279.17	2.282E-05	(P		6.765E-05	G
		72.87	6.363E-04	(		1.147E-03	G
TL-208	4.7059E-04	583.14	4.654E-04	(		8.067E-05	G
		510.72	4.902E-04	(		2.797E-04	G
PB-212	1.5791E-03	238.63	1.579E-03	(		1.004E-04	G
		77.11	0.000E+00	}		4.868E-04	Energy duplication
		74.81	2.452E-03	}		7.467E-04	G
PB-214	1.1118E-03	351.99	1.109E-03	(		1.279E-04	G
		295.22	1.118E-03	(		2.696E-04	G
		77.11	3.176E-03	}		6.426E-04	Energy duplication

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
		241.92	1.112E-03	}	8.145E-04	G
BI-207	7.4587E-05	569.67	0.000E+00	}	5.824E-05	G
		1063.62	7.459E-05	(	1.053E-04	G
		74.97	0.000E+00	}	2.134E-04	G
BI-212	1.1664E-03	727.17	1.168E-03	@(	6.160E-04	G
		1620.56	1.161E-03	?(	2.132E-03	G
		785.42	2.529E-03	+	3.135E-03	G
BI-214	1.0432E-03	609.32	1.020E-03	(	1.346E-04	G
		1764.51	1.083E-03	(	3.838E-04	G
		1120.28	1.072E-03	(	7.210E-04	G
RA-224	2.2425E-03	241.00	2.242E-03	}(	2.268E-03	G
RA-226	0.0000E+00	185.99	0.000E+00	}	1.506E-03	G
AC-228	1.3573E-03	911.07	1.263E-03	(	3.068E-04	G
		968.90	1.507E-03	*(	5.913E-04	G
		338.40	1.368E-03	(	4.296E-04	G
TH-227	0.0000E+00	236.00	0.000E+00	%	4.711E-04	G
		256.25	3.861E-04		5.515E-04	G
TH-234	1.9179E-03	63.29	1.918E-03	(	2.463E-03	G
		92.80	2.386E-03	}	1.887E-03	G
		92.38	0.000E+00	}	2.550E-03	G
U-235	1.7838E-04	185.72	1.784E-04	}	1.156E-04	G
		143.76	1.784E-04	(	4.203E-04	G
		205.31	0.000E+00	%	1.109E-03	G
		163.35	0.000E+00	%	1.002E-03	G
NP-237	0.0000E+00	86.49	0.000E+00	}	4.968E-04	G
		95.87	0.000E+00	!	1.846E-03	G
AM-241	0.0000E+00	59.54	0.000E+00	% P	2.834E-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	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
K-40		1.6541E+01	1.6541E+01	2.2073E+00	2.3971E+00
CR-51	#	3.4245E-01	6.9472E-01	8.9631E-01	8.9717E-01
MN-54	#A	2.7337E-02	2.9107E-02	4.1831E-02	4.1864E-02
MN-56	#A	2.9239E-02	>12 Halflives	5.2594E-02	5.2620E-02
FE-59	<	6.0018E-02	9.2676E-02		
CO-57	<	2.9271E-01	3.1474E-01		
CO-58	<	2.4242E-02	3.1975E-02		
CO-60	A	2.6106E-02	2.6373E-02	5.1954E-02	5.1976E-02
Cm-243		2.2533E-01	2.2570E-01	1.9260E-01	1.9302E-01
ZN-65	<	1.0745E-01	1.1644E-01		
Kr-85	<	9.8948E+02	9.8968E+02		
Y-88	#A	1.4719E-02	1.7689E-02	2.4964E-02	2.4984E-02
NB-94	<	2.5704E-02	2.5704E-02		
Ag-108M	<	4.1323E-02	4.1341E-02		
AG-110M	A	1.2474E-02	1.3491E-02	2.5072E-02	2.5084E-02
CD-109	<	1.2749E+00	1.3312E+00		
SN-113	<	5.0295E-02	5.9629E-02		
SB-125	<	9.2838E-02	9.4654E-02		
TE-131	<	4.85E-02	>12 Halflives		
TE-132	#	4.7522E-02	1.9883E+01	3.0490E+01	3.0511E+01
J-131	<	3.2789E-02	3.7510E-01		
CS-134	<	4.5509E-02	4.6708E-02		
CS-137		8.2036E-02	8.2183E-02	5.1538E-02	5.1747E-02
CE-139	A	1.5406E-02	1.7766E-02	3.9832E-02	3.9845E-02
CE-141	<	6.9110E-02	1.2657E-01		

CE-144	A	2.6003E-01	2.7859E-01	4.6054E-01	4.6080E-01

EU-152	<	6.9194E-02	6.9487E-02		
EU-154	#	7.3386E-02	7.3851E-02	1.0200E-01	1.0209E-01
EU-155	<	1.5883E-01	1.6056E-01		
TA-182	<	1.2232E-01	1.4504E-01		
HG-203	A	4.5232E-02	6.8880E-02	1.0701E-01	1.0708E-01
TL-208		3.1541E-01	>12 Halflives	8.7599E-02	8.9393E-02
PB-212		1.0584E+00	>12 Halflives	1.2730E-01	1.4065E-01
PB-214		7.4516E-01	>12 Halflives	1.3221E-01	1.3875E-01
BI-207	A	4.9991E-02	5.0062E-02	8.0517E-02	8.0567E-02
BI-212	#	7.8175E-01	>12 Halflives	5.4974E-01	5.5152E-01
BI-214		6.9921E-01	>12 Halflives	1.5981E-01	1.6462E-01
RA-224	#	1.5030E+00	3.1769E+02	2.4600E+05	1.9916E+02
AC-228		9.0970E-01	>12 Halflives	2.3494E-01	2.4050E-01
TH-227	<	3.1574E-01	9.1057E-01		
TH-234	A	1.2855E+00	2.8984E+00	3.4549E+00	3.4586E+00
U-235	A	1.1956E-01	1.1956E-01	2.5516E-01	2.5525E-01
NP-237	<	1.2371E+00	1.2371E+00		
AM-241	<	1.8995E-01	1.8997E-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) 2.0671455E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 3.5871365E+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_11JAN2005_1800.An1

Sample description
Detector 101 FSS-OOL-14-01-010-F SOIL

Spectrum Filename: C:\GammaVision\Spectra\101F_11JAN2005_1800.An1

Acquisition information
Start time: 11-Jan-2005 17:56:58
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: 1.4190E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4190E+03) =
7.0472E+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_11JAN2005_1800.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	14-Dec-2004 14:35:00
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	

Energy Calibration
Normalized diff: 0.1583

********** 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	
137.73	69.14	233.	36.	0.018	187.63	1.001	TA-182	D
173.85	87.07	242.	117.	0.058	63.11	1.014	PB-214	D
179.31	89.79	235.	96.	0.048	74.29	1.016	PB-214	D
308.18	154.27	102.	68.	0.034	96.25	1.043	XE-138	
418.38	209.45	101.	71.	0.036	69.61	1.101	AC-228	D
541.03	270.65	72.	72.	0.036	90.14	1.035	AC-228	s
600.23	300.24	36.	48.	0.024	86.60	1.118	PB-212	

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	114.	8.	0.004	533.73	0.994D
TH-234	126.14	63.29	232.	60.	0.030	114.21	0.997D
TA-182	135.06	67.75	194.	0.	0.000	0.00	1.000D
HG-203	145.31	72.87	301.	38.	0.019	197.31	1.003D
PB-212	149.19	74.81	264.	219.	0.110	37.42	1.005D
BI-207	149.51	74.97	374.	0.	0.000	0.00	0.000D
PB-214	153.79	77.11	252.	328.	0.164	26.39	1.006D
PB-212	153.79	77.11	435.	0.	0.000	491.57	0.000D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CE-144	159.81	80.12	228.	0.	0.000	0.00	0.977D
EU-155	172.48	86.45	297.	23.	0.011	331.24	1.013D
NP-237	172.56	86.49	320.	0.	0.000	0.00	1.013D
CD-109	175.66	88.04	392.	19.	0.009	456.30	1.014D
TH-234	184.34	92.38	317.	34.	0.017	229.07	1.017D
TH-234	185.18	92.80	266.	75.	0.038	98.33	1.018D
NP-237	191.32	95.87	200.	27.	0.014	226.63	1.020D
Cm-243	198.69	99.55	179.	38.	0.019	156.90	1.023D
Cm-243	207.11	103.76	180.	36.	0.018	167.48	1.026D
EU-155	210.21	105.31	152.	56.	0.028	101.53	1.027D
TE-132	224.92	112.66	215.	75.	0.038	147.78	1.756s
TE-132	232.20	116.30	149.	0.	0.000	0.00	0.443D
Cm-243	233.15	116.77	153.	103.	0.052	89.51	0.600s
EU-152	243.16	121.78	185.	8.	0.004	700.83	1.038D
CO-57	243.74	122.07	193.	0.	0.000	0.00	1.039D
EU-154	245.80	123.10	183.	21.	0.011	275.93	1.039D
CE-144	266.67	133.53	182.	15.	0.008	388.09	1.047D
CO-57	272.48	136.43	142.	21.	0.010	252.56	1.049D
U-235	287.14	143.76	188.	20.	0.010	291.73	1.054D
CE-141	290.52	145.45	181.	20.	0.010	292.43	1.055D
TE-131	299.07	149.72	177.	16.	0.008	351.48	1.058D
U-235	326.34	163.35	156.	17.	0.008	321.35	1.068D
CE-139	331.34	165.85	170.	6.	0.003	943.10	1.070D
SB-125	352.83	176.59	126.	43.	0.022	172.31	2.222s
U-235	371.10	185.72	207.	197.	0.098	7.25	1.084A
RA-226	371.64	185.99	176.	0.	0.000	5620.50	1.206A
U-235	410.29	205.31	124.	35.	0.017	145.59	1.098D
TE-132	453.38	226.85	132.	58.	0.029	156.55	0.774s
TH-227	471.70	236.00	96.	0.	0.000	0.00	1.120D
PB-212	476.96	238.63	113.	624.	0.312	14.01	1.122D
RA-224	481.70	241.00	155.	59.	0.029	97.87	1.891A
PB-214	483.54	241.92	175.	83.	0.041	9.01	1.124A
SN-113	510.43	255.36	65.	0.	0.000	0.00	1.133
TH-227	514.90	257.59	68.	30.	0.015	192.35	0.875s
Cm-243	554.93	277.60	68.	37.	0.019	105.23	1.149D
HG-203	558.07	279.17	108.	4.	0.002	475.50	1.150D
J-131	567.12	283.69	90.	18.	0.009	267.71	0.673s
PB-214	590.09	295.17	98.	187.	0.094	35.18	0.937
CR-51	641.00	320.62	33.	1.	0.001	1680.40	0.000s
AC-228	676.57	338.39	78.	122.	0.061	44.83	1.196s
EU-152	686.46	343.33	45.	41.	0.021	129.04	0.802s
PB-214	703.75	351.98	58.	284.	0.142	21.94	1.039
J-131	729.00	364.60	11.	0.	0.000	0.00	0.000s
SN-113	782.67	391.42	25.	0.	0.000	0.00	0.402s
SB-125	854.64	427.39	24.	2.	0.001	1060.66	0.795s
Ag-108M	866.09	433.11	39.	34.	0.017	159.44	1.124s
TE-131	905.33	452.72	31.	10.	0.005	262.72	1.545s
SB-125	925.60	462.85	40.	58.	0.029	64.82	1.497

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TE-131	985.94	493.01	30.	15.	0.007	194.94	1.258s
TL-208	1021.38	510.72	35.	59.	0.030	57.58	1.310D
Kr-85	1027.92	513.99	39.	8.	0.004	337.41	1.313D
CS-134	1138.58	569.29	23.	0.	0.000	0.00	0.972D
BI-207	1140.50	570.25	23.	4.	0.002	530.33	0.972
TL-208	1166.45	583.22	58.	160.	0.080	34.27	1.287
SB-125	1201.57	600.77	23.	7.	0.003	336.41	1.372D
CS-134	1209.35	604.66	34.	2.	0.001	1277.53	1.374D
BI-214	1218.68	609.32	43.	159.	0.079	29.60	1.378D
Ag-108M	1228.78	614.37	29.	0.	0.000	0.00	1.381D
SB-125	1272.03	635.98	11.	6.	0.003	248.19	0.599s
J-131	1274.00	636.97	7.	0.	0.000	0.00	0.000D
AG-110M	1315.58	657.75	24.	4.	0.002	537.93	1.410D
CS-137	1323.33	661.62	23.	32.	0.016	82.69	1.413D
NB-94	1402.07	700.97	15.	3.	0.002	552.27	0.269s
Ag-108M	1446.05	722.95	26.	2.	0.001	939.34	1.454D
EU-154	1446.75	723.30	27.	4.	0.002	507.35	1.454D
BI-212	1454.49	727.17	29.	42.	0.021	70.59	1.457D
EU-152	1557.79	778.79	11.	6.	0.003	264.58	0.963s
BI-212	1571.12	785.45	9.	5.	0.002	289.09	0.815s
CS-134	1591.75	795.76	33.	0.	0.000	0.00	1.502
CS-134	1603.00	801.38	9.	2.	0.001	526.64	0.000s
CO-58	1622.00	810.88	2.	0.	0.000	0.00	0.000s
MN-54	1670.20	834.97	8.	2.	0.001	740.95	0.656s
MN-56	1695.03	847.37	10.	8.	0.004	220.00	1.026s
NB-94	1745.49	872.59	15.	24.	0.012	109.33	1.370s
AG-110M	1771.00	885.34	4.	0.	0.000	0.00	0.000s
Y-88	1794.66	897.16	8.	14.	0.007	121.78	1.176
AC-228	1822.00	910.83	28.	99.	0.049	41.62	1.872
AG-110M	1875.00	937.31	4.	0.	0.000	0.00	0.000s
EU-152	1928.41	964.00	25.	12.	0.006	201.76	1.612D
AC-228	1938.21	968.90	21.	61.	0.030	50.10	1.616D
EU-154	2009.80	1004.67	8.	14.	0.007	131.50	0.778s
BI-207	2128.00	1063.74	3.	0.	0.000	0.00	0.250s
FE-59	2199.17	1099.30	7.	1.	0.001	1161.90	0.364s
EU-152	2224.72	1112.07	28.	6.	0.003	375.66	1.708D
ZN-65	2231.62	1115.52	29.	1.	0.001	1931.51	1.710D
BI-214	2241.15	1120.28	19.	36.	0.018	71.57	1.713D
TA-182	2243.15	1121.28	53.	0.	0.000	0.00	0.434D
TE-131	2294.00	1146.69	13.	12.	0.006	176.70	1.221
CO-60	2345.32	1172.33	34.	2.	0.001	291.55	1.286
TA-182	2376.56	1187.95	19.	18.	0.009	146.87	0.555s
TA-182	2445.17	1222.23	35.	11.	0.006	291.31	0.657s
EU-154	2550.00	1274.61	1.	0.	0.000	0.00	0.000s
FE-59	2584.97	1292.09	14.	11.	0.005	198.55	0.516s
CO-60	2665.70	1332.42	13.	9.	0.004	108.74	1.443
AG-110M	2767.67	1383.38	1.	1.	0.001	422.09	0.419s
EU-152	2816.00	1407.53	7.	1.	0.001	1161.90	0.364s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
K-40	2921.64	1460.31	14.	569.	0.285	13.25	1.829
BI-212	3242.00	1620.38	0.	6.	0.003	122.47	1.499
BI-214	3528.92	1763.74	0.	37.	0.019	49.32	1.156s
MN-56	3622.00	1810.25	0.	0.	0.000	0.00	0.000s
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		2.4422E-02	1460.75	2.442E-02	(	8.647E-04	G
CR-51		0.0000E+00	320.07	0.000E+00	%	3.369E-04	G
MN-54		0.0000E+00	834.81	0.000E+00	%	4.546E-05	G
MN-56		2.1573E-05	846.60	2.157E-05	&(	5.123E-05	G
			1811.20	0.000E+00	?	1.512E-04	G
FE-59		0.0000E+00	1099.22	0.000E+00	%	9.535E-05	G
			1291.56	1.050E-04	?	1.922E-04	G
CO-57		1.2632E-04	122.07	0.000E+00	} P	5.039E-05	G
			136.43	1.263E-04	$(	3.548E-04	G
CO-58		0.0000E+00	810.75	0.000E+00	?	2.562E-05	G
CO-60		3.7538E-05	1332.51	3.754E-05	?(P	8.305E-05	G
			1173.23	0.000E+00	& P	1.133E-04	G
Cm-243		2.1993E-04	277.60	2.651E-04	(	2.903E-04	G
			117.00	6.099E-04	}	3.574E-04	G
			103.76	1.012E-04	-	1.854E-04	G
			99.55	1.758E-04	(	3.006E-04	G
ZN-65		0.0000E+00	1115.52	0.000E+00	%	1.982E-04	G
Kr-85		0.0000E+00	513.99	0.000E+00	%	1.322E+00	G
Y-88		0.0000E+00	1836.01	0.000E+00	% P	4.191E-05	G
			898.02	4.426E-05	& P	5.107E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	7.0099E-05	871.10	7.010E-05	&(	6.063E-05		G
		702.50	0.000E+00	&	4.993E-05		G
Ag-108M	0.0000E+00	722.95	0.000E+00	}	7.181E-05		G
		614.37	0.000E+00	!	6.576E-05		G
		433.93	5.745E-05	&	5.375E-05		G
AG-110M	0.0000E+00	657.75	0.000E+00	%	6.108E-05		G
		884.67	0.000E+00	?	4.889E-05		G
		937.48	0.000E+00	?	1.093E-04		G
		1384.27	0.000E+00	%	1.326E-04		G
CD-109	0.0000E+00	88.04	0.000E+00	%	1.753E-03		G
SN-113	0.0000E+00	391.71	0.000E+00	% P	5.520E-05		G
		255.04	0.000E+00	%	1.785E-03		G
SB-125	0.0000E+00	427.95	0.000E+00	%	1.293E-04		G
		600.77	0.000E+00	%	2.858E-04		G
		636.15	1.208E-04	}	3.536E-04		G
		463.51	9.477E-04	&	5.243E-04		G
		176.29	4.819E-04	*	6.165E-04		G
TE-131	0.0000E+00	149.72	0.000E+00	%	6.188E-05		G
		452.32	8.971E-05		2.476E-04		G
		1146.96	8.741E-04	?	1.478E-03		G
		492.66	5.332E-04	*	1.004E-03		G
TE-132	1.0708E-04	228.16	5.486E-05	&(	5.321E-05		G
		116.30	0.000E+00	}	1.956E-03		G
		111.76	2.605E-03	&(	2.468E-03		G
J-131	0.0000E+00	364.48	0.000E+00	?	2.862E-05		G
		636.97	0.000E+00	}	4.546E-04		G
		284.29	3.002E-04	&	7.824E-04		G
CS-134	0.0000E+00	604.66	0.000E+00	%	6.413E-05		G
		795.76	0.000E+00	%	9.257E-05		G
		569.29	0.000E+00	}	3.209E-04		G
		801.84	0.000E+00	%	5.105E-04		G
CS-137	8.6883E-05	661.62	8.688E-05	(	6.803E-05		G
CE-139	0.0000E+00	165.85	0.000E+00	% P	5.442E-05		G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-141	2.7328E-05	145.45	2.733E-05	(	8.913E-05		G
CE-144	0.0000E+00	133.53	0.000E+00	%	3.904E-04		G
		80.12	0.000E+00	!	3.437E-03		G
EU-152	1.8870E-04	121.78	0.000E+00	}	1.443E-04		G
		344.30	1.839E-04	&(	1.523E-04		G
		1408.08	0.000E+00	%	3.153E-04		G
		964.00	2.570E-04	$(	5.725E-04		G
		1112.07	0.000E+00	%	7.260E-04		G
		778.90	1.221E-04	?(	3.695E-04		G
EU-154	1.0149E-04	123.10	3.376E-05	(	1.037E-04		G
		1274.80	0.000E+00	?	8.460E-05		G
		723.30	0.000E+00	}	3.349E-04		G
		1004.80	2.572E-04	(	3.042E-04		G
EU-155	1.6707E-04	86.45	0.000E+00	}	1.796E-04		G
		105.31	1.671E-04	(	1.793E-04		G
TA-182	0.0000E+00	67.75	0.000E+00	%	1.610E-04		G
		1121.28	0.000E+00	&	3.826E-04		G
		1221.42	1.624E-04	@	4.320E-04		G
		1189.05	4.274E-04	&	5.326E-04		G
HG-203	0.0000E+00	279.17	0.000E+00	% P	6.231E-05		G
		72.87	5.108E-04		1.109E-03		G
TL-208	3.9517E-04	583.14	3.761E-04	(	8.980E-05		G
		510.72	4.680E-04	(	2.391E-04		G
PB-212	1.2557E-03	238.63	1.256E-03	(	1.050E-04		G
		77.11	0.000E+00	}	4.484E-04		Energy duplication
		74.81	1.865E-03	}	6.674E-04		G
PB-214	9.7029E-04	351.99	9.452E-04	(	1.279E-04		G
		295.22	1.019E-03	(	2.661E-04		G
		77.11	2.407E-03	}	5.631E-04		Energy duplication
		241.92	9.703E-04	}	7.565E-04		G
BI-207	0.0000E+00	569.67	0.000E+00	}	5.056E-05		G
		1063.62	0.000E+00	?	4.874E-05		G
		74.97	0.000E+00	}	1.959E-04		G
BI-212	9.3145E-04	727.17	8.923E-04	(	5.813E-04		G
		1620.56	1.099E-03	?(	1.350E-03		G
		785.42	6.213E-04	-	2.256E-03		G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-214	7.6231E-04	609.32	7.257E-04	(	1.526E-04		G
		1764.51	1.266E-03	+	2.521E-04		G
		1120.28	8.746E-04	(	5.583E-04		G
RA-224	1.3203E-03	241.00	1.320E-03	}(	2.019E-03		G
RA-226	0.0000E+00	185.99	0.000E+00	}	1.177E-03		G
AC-228	1.0952E-03	911.07	1.036E-03	(	2.876E-04		G
		968.90	1.118E-03	(	4.438E-04		G
		338.40	1.206E-03	*(	4.358E-04		G
TH-227	0.0000E+00	236.00	0.000E+00	%	3.714E-04		G
		256.25	4.064E-04	&	5.572E-04		G
TH-234	1.8611E-03	63.29	1.861E-03	(	2.280E-03		G
		92.80	1.702E-03	}	1.782E-03		G
		92.38	8.967E-04	}	2.270E-03		G
U-235	2.6450E-04	185.72	2.645E-04	}	9.383E-05		G
		143.76	1.271E-04	(	4.133E-04		G
		205.31	5.716E-04	(	9.009E-04		G
		163.35	0.000E+00	%	8.827E-04		G
NP-237	6.1843E-04	86.49	0.000E+00	}	4.648E-04		G
		95.87	6.184E-04	(	1.551E-03		G
AM-241	0.0000E+00	59.54	0.000E+00	% P	2.282E-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		1.7211E+01	1.7211E+01	2.2812E+00	2.4799E+00
CR-51	<	2.3744E-01	4.8013E-01		
MN-54	<	3.2038E-02	3.4103E-02		
MN-56	#A	1.5203E-02	>12 Halflives	3.3446E-02	3.3457E-02
FE-59	<	6.7192E-02	1.0355E-01		
CO-57	A	8.9018E-02	9.5687E-02	2.4167E-01	2.4173E-01
CO-58	<	1.8055E-02	2.3783E-02		
CO-60	#A	2.6454E-02	2.6723E-02	5.0289E-02	5.0312E-02
Cm-243	A	1.5499E-01	1.5525E-01	1.4665E-01	1.4692E-01
ZN-65	<	1.3967E-01	1.5130E-01		
Kr-85	<	9.3137E+02	9.3156E+02		
Y-88	<	2.9538E-02	3.5468E-02		
NB-94	#	4.9401E-02	4.9401E-02	5.4010E-02	5.4082E-02
Ag-108M	<	4.6344E-02	4.6363E-02		
AG-110M	<	4.3044E-02	4.6538E-02		
CD-109	<	1.2355E+00	1.2899E+00		
SN-113	<	3.8900E-02	4.6083E-02		
SB-125	<	9.1090E-02	9.2864E-02		
TE-131	<	4.36E-02	>12 Halflives		
TE-132	#	7.5465E-02	3.0721E+01	3.3068E+01	3.3114E+01
J-131	<	2.0166E-02	2.2816E-01		
CS-134	<	4.5193E-02	4.6378E-02		
CS-137		6.1228E-02	6.1337E-02	5.0720E-02	5.0838E-02
CE-139	<	3.8349E-02	4.4194E-02		
CE-141	A	1.9258E-02	3.5175E-02	1.0286E-01	1.0288E-01
CE-144	<	2.7512E-01	2.9467E-01		
EU-152	C	1.3298E-01	1.3354E-01	1.5885E-01	1.5903E-01
EU-154	A	7.1523E-02	7.1974E-02	9.4649E-02	9.4733E-02
EU-155	A	1.1774E-01	1.1901E-01	1.2083E-01	1.2101E-01
TA-182	<	1.1349E-01	1.3447E-01		
HG-203	<	4.3909E-02	6.6738E-02		
TL-208		2.7848E-01	>12 Halflives	9.3298E-02	9.4615E-02
PB-212		8.8491E-01	>12 Halflives	1.2402E-01	1.3372E-01
PB-214		6.8378E-01	>12 Halflives	1.4176E-01	1.4693E-01
BI-207	<	3.4346E-02	3.4394E-02		

BI-212		6.5642E-01	>12 Halflives	4.6339E-01	4.6487E-01
BI-214		5.3722E-01	>12 Halflives	1.5903E-01	1.6190E-01
RA-224	#	9.3048E-01	1.9196E+02	2.4358E+05	1.8819E+02
AC-228		7.7183E-01	>12 Halflives	2.0342E-01	2.0805E-01
TH-227	<	2.6170E-01	7.5112E-01		
TH-234	A	1.3115E+00	2.9463E+00	3.3650E+00	3.3690E+00
U-235	A	1.8640E-01	1.8640E-01	2.7137E-01	2.7157E-01
NP-237	A	4.3582E-01	4.3582E-01	9.8768E-01	9.8797E-01
AM-241	<	1.6083E-01	1.6085E-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) 2.0873188E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 2.4420543E+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_11JAN2005_1840.An1

Sample description
Detector 101 FSS-OOL-14-01-011-F SOIL

Spectrum Filename: C:\GammaVision\Spectra\101F_11JAN2005_1840.An1

Acquisition information
Start time: 11-Jan-2005 18:33:04
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: 1.7460E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7460E+03) =
5.7274E+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	14-Dec-2004 15:20:00
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: 0.1950

********** 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	
168.11	84.29	300.	101.	0.050	78.94	1.012	TA-182	D
174.03	87.25	365.	191.	0.095	47.76	1.014	PB-214	D
179.49	89.98	287.	141.	0.070	57.00	1.016	PB-214	D
198.35	99.41	251.	66.	0.033	107.57	1.022	AC-228	D
258.14	129.26	299.	70.	0.035	111.51	1.044	AC-228	D
417.95	208.82	160.	60.	0.030	97.07	1.101	LU-177	D
540.51	270.39	94.	92.	0.046	80.25	1.279	AC-228	s
925.37	462.65	55.	41.	0.020	89.94	1.278	CS-138	D
1929.14	964.45	19.	31.	0.016	79.19	1.613	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	280.	44.	0.022	168.17	0.994D
TH-234	126.14	63.29	288.	51.	0.025	147.87	0.996D
TA-182	135.94	68.19	202.	42.	0.021	193.47	1.452s
HG-203	145.31	72.87	398.	45.	0.022	193.92	1.003D
PB-212	149.19	74.81	365.	272.	0.136	34.89	1.005D
BI-207	149.51	74.97	318.	0.	0.000	0.00	0.654D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PB-214	153.79	77.11	356.	450.	0.225	22.71	1.006D
PB-212	153.79	77.11	558.	0.	0.000	271.09	0.445D
CE-144	159.81	80.12	131.	0.	0.000	0.00	0.000D
EU-155	172.48	86.45	496.	27.	0.014	348.80	1.013D
NP-237	172.56	86.49	523.	0.	0.000	0.00	1.013D
CD-109	175.66	88.04	478.	29.	0.014	327.30	1.014D
TH-234	184.34	92.38	495.	0.	0.000	0.00	1.017D
TH-234	185.18	92.80	297.	190.	0.095	44.30	1.018D
NP-237	191.32	95.87	245.	27.	0.014	250.65	1.020D
Cm-243	198.69	99.55	315.	0.	0.000	0.00	0.711D
Cm-243	207.11	103.76	276.	0.	0.000	0.00	0.700D
EU-155	210.21	105.31	245.	70.	0.035	100.80	1.027D
TE-132	220.33	110.37	188.	2.	0.001	3716.18	0.800
TE-132	232.20	116.30	340.	0.	0.000	0.00	1.291D
Cm-243	234.69	117.54	160.	16.	0.008	450.00	1.071
EU-152	243.16	121.78	250.	13.	0.006	530.68	1.038D
CO-57	243.74	122.07	264.	0.	0.000	0.00	1.039D
EU-154	245.80	123.10	268.	5.	0.003	1378.11	1.039D
CE-144	266.67	133.53	283.	22.	0.011	335.22	1.047D
CO-57	272.48	136.43	209.	20.	0.010	316.50	1.049D
U-235	287.14	143.76	244.	28.	0.014	245.61	1.054D
CE-141	290.52	145.45	237.	26.	0.013	259.92	1.055D
TE-131	299.07	149.72	284.	13.	0.007	552.22	1.059D
U-235	326.34	163.35	140.	5.	0.003	1007.51	1.068D
CE-139	331.34	165.85	215.	18.	0.009	353.14	1.070D
SB-125	353.84	177.09	161.	37.	0.019	223.75	0.870s
U-235	371.10	185.72	325.	128.	0.064	12.23	1.084A
RA-226	371.64	185.99	258.	7.	0.003	984.52	1.154A
U-235	410.29	205.31	162.	13.	0.006	424.99	1.098D
TE-132	453.09	226.70	176.	30.	0.015	220.06	0.717
TH-227	471.70	236.00	123.	8.	0.004	566.14	1.120D
PB-212	476.96	238.63	142.	784.	0.392	12.51	1.122D
RA-224	481.70	241.00	140.	65.	0.032	86.28	2.134A
PB-214	483.54	241.92	183.	93.	0.047	9.03	1.124A
SN-113	509.06	254.67	89.	0.	0.000	0.00	1.133
TH-227	511.44	255.86	48.	28.	0.014	140.52	0.932
Cm-243	554.93	277.60	104.	58.	0.029	84.37	1.149D
HG-203	558.07	279.17	131.	16.	0.008	231.89	1.150D
J-131	564.78	282.52	105.	34.	0.017	156.35	0.491s
PB-214	590.05	295.15	115.	184.	0.092	36.12	1.184
CR-51	640.00	320.12	29.	1.	0.000	2111.87	0.000s
AC-228	676.21	338.22	85.	115.	0.057	45.20	1.037
EU-152	686.71	343.46	50.	9.	0.004	334.44	0.666s
PB-214	703.52	351.86	79.	344.	0.172	20.77	1.136
J-131	730.43	365.31	60.	54.	0.027	120.95	0.738s
SN-113	783.12	391.65	48.	12.	0.006	248.75	0.848
SB-125	860.27	430.20	42.	11.	0.005	293.74	0.633s
Ag-108M	867.97	434.05	21.	4.	0.002	431.11	0.382s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TE-131	902.40	451.26	22.	3.	0.002	590.55	0.694s
SB-125	926.92	463.51	77.	8.	0.004	501.12	1.278D
TE-131	984.70	492.39	33.	3.	0.002	774.79	0.412s
TL-208	1021.38	510.72	61.	74.	0.037	56.77	1.311D
Kr-85	1027.92	513.99	56.	2.	0.001	1417.77	1.313D
CS-134	1138.58	569.29	28.	0.	0.000	0.00	1.199D
BI-207	1140.85	570.43	32.	16.	0.008	177.45	1.421
TL-208	1166.23	583.11	38.	229.	0.115	24.26	1.446
SB-125	1201.57	600.77	22.	0.	0.000	0.00	0.393D
CS-134	1209.35	604.66	49.	1.	0.000	5682.37	1.374D
BI-214	1218.68	609.32	35.	289.	0.144	19.68	1.378D
Ag-108M	1228.78	614.37	29.	4.	0.002	573.30	1.381D
SB-125	1272.36	636.15	27.	0.	0.000	0.00	2.132D
J-131	1276.00	637.97	19.	3.	0.002	595.48	0.000s
AG-110M	1315.58	657.75	27.	16.	0.008	156.58	1.410D
CS-137	1323.33	661.62	31.	14.	0.007	193.77	1.413D
NB-94	1404.89	702.38	19.	6.	0.003	329.19	1.110
Ag-108M	1446.05	722.95	23.	0.	0.000	0.00	1.454D
EU-154	1446.75	723.30	15.	8.	0.004	229.82	1.454D
BI-212	1454.49	727.17	27.	51.	0.026	59.94	1.457D
EU-152	1556.00	777.90	7.	2.	0.001	471.43	0.250s
BI-212	1570.21	785.00	30.	33.	0.016	106.22	0.661s
CS-134	1590.80	795.29	26.	30.	0.015	106.47	1.018s
CS-134	1603.91	801.84	27.	0.	0.000	0.00	1.506
CO-58	1620.38	810.07	6.	1.	0.001	948.68	0.531s
MN-54	1670.50	835.12	10.	24.	0.012	88.98	1.515s
MN-56	1691.84	845.78	20.	8.	0.004	293.68	0.586s
NB-94	1744.00	871.85	12.	9.	0.004	202.76	0.549s
AG-110M	1769.17	884.42	12.	4.	0.002	396.86	0.446s
Y-88	1796.00	897.83	9.	1.	0.000	893.73	0.428s
AC-228	1822.26	910.96	22.	136.	0.068	31.07	1.413
AG-110M	1874.42	937.02	18.	8.	0.004	269.57	0.458s
EU-152	1928.41	964.00	50.	0.	0.000	0.00	1.612D
AC-228	1938.21	968.90	28.	77.	0.038	45.03	1.616D
EU-154	2009.56	1004.55	4.	2.	0.001	519.62	0.800s
BI-207	2128.00	1063.74	5.	0.	0.000	0.00	0.000s
FE-59	2199.00	1099.22	6.	0.	0.000	887.41	0.000s
EU-152	2224.72	1112.07	30.	5.	0.003	465.41	1.708D
ZN-65	2231.62	1115.52	27.	8.	0.004	287.39	1.710D
BI-214	2241.15	1120.28	28.	44.	0.022	68.25	1.713D
TA-182	2243.15	1121.28	66.	0.	0.000	0.00	1.713D
TE-131	2293.00	1146.19	13.	3.	0.002	538.52	0.575s
CO-60	2345.03	1172.19	32.	16.	0.008	123.51	1.416
TA-182	2374.68	1187.01	32.	14.	0.007	224.74	0.448s
TA-182	2444.20	1221.74	18.	4.	0.002	474.34	0.937s
EU-154	2551.18	1275.20	6.	9.	0.005	152.82	0.566s
FE-59	2584.35	1291.78	9.	3.	0.001	469.23	0.822s
CO-60	2664.58	1331.86	14.	18.	0.009	87.23	0.687s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AG-110M	2768.25	1383.67	6.	4.	0.002	326.92	0.500s
EU-152	2815.64	1407.35	11.	19.	0.010	118.63	0.691s
K-40	2921.81	1460.40	12.	579.	0.289	12.97	1.749
BI-212	3241.00	1619.88	1.	2.	0.001	341.73	0.176s
BI-214	3529.72	1764.14	0.	51.	0.025	42.01	1.230s
MN-56	3622.00	1810.25	0.	0.	0.000	335.41	0.200s
Y-88	3672.50	1835.48	0.	2.	0.001	212.13	0.999s

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

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

- Nuclide - Name	Code	Average Activity microCi	Peak Energy keV	Peak Activity microCi	Peak Code	Peak MDA Value microCi	Comments
K-40		2.4851E-02	1460.75	2.485E-02	(	8.092E-04	G
CR-51		0.0000E+00	320.07	0.000E+00	%	3.209E-04	G
MN-54		6.7508E-05	834.81	6.751E-05	(	4.907E-05	G
MN-56		2.3011E-05	846.60	2.301E-05	&(	6.774E-05	G
			1811.20	0.000E+00	%	1.512E-04	G
FE-59		0.0000E+00	1099.22	0.000E+00	%	8.647E-05	G
			1291.56	0.000E+00	%	1.605E-04	G
CO-57		0.0000E+00	122.07	0.000E+00	} P	5.857E-05	G
			136.43	0.000E+00	%	4.267E-04	G
CO-58		0.0000E+00	810.75	0.000E+00	%	3.891E-05	G
CO-60		6.8745E-05	1332.51	7.637E-05	(P	8.528E-05	G
			1173.23	6.111E-05	&(P	1.102E-04	G
Cm-243		4.1049E-04	277.60	4.105E-04	(	3.556E-04	G
			117.00	0.000E+00	}	3.651E-04	G
			103.76	0.000E+00	&	2.275E-04	G
			99.55	0.000E+00	!	3.947E-04	G
ZN-65		5.8664E-05	1115.52	5.866E-05	(	1.918E-04	G
Kr-85		0.0000E+00	513.99	0.000E+00	%	1.562E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Y-88	9.9714E-06	1836.01	9.971E-06	?(P	4.191E-05		G
		898.02	0.000E+00	% P	5.442E-05		G
NB-94	2.6287E-05	871.10	2.629E-05	(	5.507E-05		G
		702.50	0.000E+00	%	5.559E-05		G
Ag-108M	0.0000E+00	722.95	0.000E+00	}	6.838E-05		G
		614.37	0.000E+00	%	6.565E-05		G
		433.93	0.000E+00	%	4.037E-05		G
AG-110M	4.6225E-05	657.75	3.829E-05	(	6.430E-05		G
		884.67	0.000E+00	%	7.662E-05		G
		937.48	6.813E-05	?(	2.017E-04		G
		1384.27	0.000E+00	%	2.541E-04		G
CD-109	0.0000E+00	88.04	0.000E+00	%	1.930E-03		G
SN-113	2.5968E-05	391.71	2.597E-05	(P	7.480E-05		G
		255.04	0.000E+00	%	2.068E-03		G
SB-125	1.1866E-04	427.95	5.567E-05	&(	1.666E-04		G
		600.77	0.000E+00	%	2.804E-04		G
		636.15	0.000E+00	}	5.275E-04		G
		463.51	0.000E+00	%	7.079E-04		G
		176.29	4.146E-04	&(	6.930E-04		G
TE-131	0.0000E+00	149.72	0.000E+00	%	7.777E-05		G
		452.32	0.000E+00	&	2.118E-04		G
		1146.96	0.000E+00	%	1.462E-03		G
		492.66	0.000E+00	%	1.043E-03		G
TE-132	2.7904E-05	228.16	2.790E-05	&(	6.096E-05		G
		116.30	0.000E+00	}	2.909E-03		G
		111.76	0.000E+00	&	2.311E-03		G
J-131	8.5064E-05	364.48	8.506E-05	&(	6.113E-05		G
		636.97	0.000E+00	}	6.905E-04		G
		284.29	5.670E-04	&	8.415E-04		G
CS-134	0.0000E+00	604.66	0.000E+00	%	7.607E-05		G
		795.76	9.569E-05	*	8.303E-05		G
		569.29	0.000E+00	}	3.505E-04		G
		801.84	0.000E+00		8.366E-04		G
CS-137	3.6412E-05	661.62	3.641E-05	(	7.759E-05		G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-139	0.0000E+00	165.85	0.000E+00	% P	6.089E-05		G
CE-141	3.5184E-05	145.45	3.518E-05	(	1.015E-04		G
CE-144	0.0000E+00	133.53	0.000E+00	%	4.831E-04		G
		80.12	0.000E+00	&	2.639E-03		G
EU-152	0.0000E+00	121.78	0.000E+00	}	1.670E-04		G
		344.30	0.000E+00	&	1.599E-04		G
		1408.08	4.053E-04		3.758E-04		G
		964.00	0.000E+00	!	7.812E-04		G
		1112.07	0.000E+00	%	7.501E-04		G
		778.90	0.000E+00	&	2.999E-04		G
EU-154	0.0000E+00	123.10	0.000E+00	%	1.247E-04		G
		1274.80	1.052E-04	?	1.603E-04		G
		723.30	1.009E-04	}	2.600E-04		G
		1004.80	0.000E+00	%	2.151E-04		G
EU-155	2.0983E-04	86.45	0.000E+00	}	2.301E-04		G
		105.31	2.098E-04	(	2.253E-04		G
TA-182	1.6537E-04	67.75	1.012E-04	(	1.644E-04		G
		1121.28	0.000E+00	%	4.224E-04		G
		1221.42	0.000E+00	%	3.221E-04		G
		1189.05	3.264E-04	&(	6.778E-04		G
HG-203	0.0000E+00	279.17	0.000E+00	% P	6.826E-05		G
		72.87	5.960E-04		1.271E-03		G
TL-208	5.4809E-04	583.14	5.383E-04	(	7.390E-05		G
		510.72	5.854E-04	(	3.095E-04		G
PB-212	1.5784E-03	238.63	1.578E-03	(	1.173E-04		G
		77.11	0.000E+00	}	5.060E-04		Energy duplication
		74.81	2.316E-03	}	7.806E-04		G
PB-214	1.0980E-03	351.99	1.148E-03	(	1.470E-04		G
		295.22	1.002E-03	(	2.870E-04		G
		77.11	3.305E-03	}	6.651E-04		Energy duplication
		241.92	1.098E-03	}	7.731E-04		G
BI-207	0.0000E+00	569.67	3.329E-05	}	5.824E-05		G
		1063.62	0.000E+00	?	5.935E-05		G
		74.97	0.000E+00	}	1.811E-04		G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-212	1.0780E-03	727.17	1.078E-03	(	5.643E-04		G
		1620.56	0.000E+00	%	1.419E-03		G
		785.42	4.349E-03	+	3.777E-03		G
BI-214	1.3209E-03	609.32	1.321E-03	(	1.387E-04		G
		1764.51	1.745E-03	+	2.521E-04		G
		1120.28	1.064E-03	-	6.624E-04		G
RA-224	1.4475E-03	241.00	1.447E-03	}(	2.307E-03		G
RA-226	0.0000E+00	185.99	0.000E+00	}	1.547E-03		G
AC-228	1.4205E-03	911.07	1.425E-03	(	2.575E-04		G
		968.90	1.413E-03	(	5.039E-04		G
		338.40	1.138E-03	-	4.532E-04		G
TH-227	0.0000E+00	236.00	0.000E+00	%	4.169E-04		G
		256.25	3.793E-04	?	4.740E-04		G
TH-234	1.5729E-03	63.29	1.573E-03	(	2.533E-03		G
		92.80	4.294E-03	}	1.881E-03		G
		92.38	0.000E+00	}	2.818E-03		G
U-235	1.7240E-04	185.72	1.724E-04	}	1.167E-04		G
		143.76	1.724E-04	(	4.693E-04		G
		205.31	0.000E+00	%	1.022E-03		G
		163.35	0.000E+00	%	8.381E-04		G
NP-237	6.1540E-04	86.49	0.000E+00	}	5.902E-04		G
		95.87	6.154E-04	(	1.710E-03		G
AM-241	1.8990E-04	59.54	1.899E-04	(P	3.518E-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		1.4233E+01	1.4233E+01	1.8466E+00	2.0142E+00
CR-51	<	1.8379E-01	3.7160E-01		
MN-54	#	3.8664E-02	4.1157E-02	3.6619E-02	3.6693E-02
MN-56	#A	1.3179E-02	>12 Halflives	3.8706E-02	3.8713E-02
FE-59	<	4.9523E-02	7.6312E-02		
CO-57	<	2.4439E-01	2.6269E-01		
CO-58	<	2.2285E-02	2.9354E-02		
CO-60	A	3.9373E-02	3.9774E-02	4.2281E-02	4.2340E-02
Cm-243		2.3510E-01	2.3549E-01	1.9869E-01	1.9914E-01
ZN-65	A	3.3599E-02	3.6397E-02	1.0460E-01	1.0462E-01
Kr-85	<	8.9480E+02	8.9498E+02		
Y-88	#A	5.7110E-03	6.8574E-03	1.6593E-02	1.6598E-02
NB-94	A	1.5056E-02	1.5056E-02	3.0527E-02	3.0539E-02
Ag-108M	<	3.7602E-02	3.7618E-02		
AG-110M	A	2.6475E-02	2.8624E-02	4.4616E-02	4.4645E-02
CD-109	<	1.1056E+00	1.1542E+00		
SN-113	A	1.4873E-02	1.7618E-02	4.8160E-02	4.8170E-02
SB-125	#A	6.7964E-02	6.9286E-02	1.2792E-01	1.2798E-01
TE-131	<	4.45E-02	>12 Halflives		
TE-132	#A	1.5982E-02	6.4975E+00	1.4298E+01	1.4303E+01
J-131		4.8720E-02	5.5092E-01	6.6635E-01	6.6708E-01
CS-134	<	4.3568E-02	4.4711E-02		
CS-137	A	2.0854E-02	2.0891E-02	4.0482E-02	4.0500E-02
CE-139	<	3.4875E-02	4.0189E-02		
CE-141	A	2.0151E-02	3.6801E-02	9.5651E-02	9.5673E-02
CE-144	<	2.7671E-01	2.9637E-01		
EU-152	<	9.1587E-02	9.1973E-02		
EU-154	<	7.1448E-02	7.1898E-02		
EU-155	A	1.2018E-01	1.2148E-01	1.2244E-01	1.2263E-01
TA-182		9.4712E-02	1.1221E-01	1.6639E-01	1.6650E-01

HG-203	<	3.9098E-02	5.9420E-02

TL-208		3.1391E-01	>12 Halflives	7.6162E-02	7.8200E-02
PB-212		9.0400E-01	>12 Halflives	1.1307E-01	1.2407E-01
PB-214		6.2887E-01	>12 Halflives	1.3059E-01	1.3534E-01
BI-207	<	3.3994E-02	3.4042E-02		
BI-212		6.1739E-01	>12 Halflives	3.7003E-01	3.7167E-01
BI-214		7.5652E-01	>12 Halflives	1.4888E-01	1.5490E-01
RA-224	#	8.2903E-01	1.7083E+02	1.8792E+05	1.4771E+02
AC-228		8.1357E-01	>12 Halflives	2.2252E-01	2.2722E-01
TH-227	<	2.3877E-01	6.8514E-01		
TH-234	A	9.0083E-01	2.0233E+00	2.9918E+00	2.9939E+00
U-235	A	9.8741E-02	9.8741E-02	2.4252E-01	2.4258E-01
NP-237	A	3.5246E-01	3.5246E-01	8.8343E-01	8.8364E-01
AM-241	A	1.0876E-01	1.0877E-01	1.8401E-01	1.8411E-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) 1.7320610E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 1.9547382E+02 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_12JAN2005_1350.An1

Sample description
Detector 101 FSS-OOL-14-01-018-FB SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_12JAN2005_1350.An1

Acquisition information

Start time:	12-Jan-2005 13:41:02
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:	1.2640E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.2640E+03) = 7.9114E+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_12JAN2005_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	14-Dec-2004 10:30:00
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: 0.2056

***** 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	201.	15.46	1.00	1.643E-02				
74.46	201.	15.46	1.00	1.643E-02	74.81	9.600	1.357E+00	PB212
77.71	191.	18.48	1.01	1.736E-02	77.11	10.700	1.108E+00	PB214
					77.11	17.500	6.772E-01	PB212
92.80	113.	35.42	1.50	1.989E-02	92.38	2.570	2.360E+00	TH234
					92.80	3.000	2.017E+00	TH234
92.84	114.	35.46	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	2.036E+00	TH234
129.31	84.	35.50	0.97	2.109E-02				
186.12	157.	21.50	1.48	1.858E-02	185.99	3.280	2.754E+00	RA226
209.23	83.	30.92	0.99	1.722E-02				
238.65	921.	3.68	1.12	1.558E-02				
238.65	921.	3.68	1.12	1.558E-02	238.63	43.100	1.467E+00	PB212
241.48	112.	18.65	1.12	1.543E-02	241.00	3.900	1.983E+00	RA224
269.94	102.	21.57	1.79	1.402E-02				
277.25	52.	40.24	0.96	1.369E-02				
277.25	52.	40.24	0.96	1.369E-02	279.17	81.500	PBC<MDA	HG203
295.17	186.	11.63	0.82	1.292E-02				
295.17	186.	11.63	0.82	1.292E-02	295.22	19.200	8.008E-01	PB214
300.36	82.	21.67	1.12	1.271E-02				
328.08	53.	30.41	0.72	1.169E-02				
338.50	172.	12.95	1.19	1.135E-02	338.40	12.010	1.351E+00	AC228
351.90	295.	7.60	1.07	1.093E-02				
351.90	295.	7.60	1.07	1.093E-02	351.99	37.100	7.787E-01	PB214
463.04	61.	27.12	1.00	8.350E-03				
463.04	61.	27.12	1.00	8.350E-03	463.51	10.000	7.950E-01	SB125

510.36	91.	22.66	1.88	7.596E-03	510.72	22.500	5.672E-01	TL208
583.05	235.	7.73	1.31	6.685E-03	583.14	86.000	4.374E-01	TL208
609.09	228.	7.71	1.20	6.415E-03	609.32	46.090	8.244E-01	BI214
661.62	95.	17.07	1.44	5.937E-03	661.62	84.620	2.029E-01	CS137
727.37	55.	24.36	1.93	5.442E-03	727.17	11.800	9.222E-01	BI212
910.96	149.	11.06	1.87	4.447E-03	911.07	29.000	1.235E+00	AC228
967.93	118.	12.22	1.03	4.216E-03	968.90	17.460	1.715E+00	AC228
1120.01	68.	21.21	1.53	3.712E-03	1120.28	15.040	1.303E+00	BI214
1460.42	488.	4.62	1.80	2.943E-03	1460.75	10.700	1.657E+01	K40
1763.98	33.	17.41	2.46	2.481E-03	1764.51	15.920	8.931E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
258.23	129.31	356.	94.	0.047	90.32	0.969	AC-228	s
418.13	209.23	251.	83.	0.042	92.76	0.992	AC-228	
477.00	238.62	113.	921.	0.461	11.03	1.122	PB-212	D
482.67	241.45	161.	112.	0.056	55.94	1.123	RA-224	D
539.61	269.94	154.	102.	0.051	64.71	1.789	AC-228	s
554.23	277.25	147.	52.	0.026	120.72	0.964	TL-208	l
600.47	300.36	107.	82.	0.041	62.77	1.116	PB-212	s
655.94	328.08	95.	53.	0.027	91.23	0.719	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	149.08	74.76	870.	235.	0.118	56.69	1.499
PB-214	153.79	77.11	837.	321.	0.160	41.80	1.499D
PB-212	153.79	77.11	837.	321.	0.160	41.80	1.499D
TH-234	185.25	92.84	755.	114.	0.057	106.38	1.499
TH-234	185.18	92.80	739.	113.	0.056	106.26	1.499
RA-226	371.62	185.98	364.	103.	0.051	84.24	1.499s
PB-212	476.96	238.63	321.	684.	0.342	15.96	1.499
RA-224	483.31	241.81	430.	98.	0.049	95.05	1.499s
PB-214	590.25	295.25	120.	176.	0.088	34.82	1.499
AC-228	676.78	338.50	121.	172.	0.086	38.86	1.185s
PB-214	703.58	351.89	80.	264.	0.132	23.40	1.499
SB-125	925.74	462.92	68.	53.	0.026	77.90	1.499
TL-208	1020.67	510.36	103.	91.	0.045	67.98	1.878s
TL-208	1166.12	583.05	37.	235.	0.118	23.20	1.306
BI-214	1218.22	609.09	35.	228.	0.114	23.13	1.196
CS-137	1323.33	661.62	53.	95.	0.048	51.22	1.444s
BI-212	1454.43	727.14	27.	33.	0.017	84.40	1.499s
AC-228	1822.28	910.96	36.	149.	0.075	33.17	1.869
AC-228	1936.27	967.93	30.	118.	0.059	36.67	1.030s
BI-214	2240.60	1120.01	40.	68.	0.034	63.63	1.527
K-40	2921.85	1460.42	4.	488.	0.244	13.86	1.798
BI-214	3529.39	1763.98	0.	33.	0.016	52.22	2.456s

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		7.8334E-02						
			477.56	7.833E-02	%(	9.061E-01	2.62E-01	G
K-40		1.6571E+01						
			1460.75	1.657E+01	(	4.085E-01	7.65E-01	G
MN-54		3.2451E-02						
			834.81	3.245E-02	%(	6.210E-02	1.90E-02	G
CO-57		1.5015E-02						
			122.07	1.501E-02	%(P	7.048E-02	2.11E-02	G K
			136.43	-1.838E-03	&	5.759E-01	1.71E-01	G
CO-60		2.4712E-03						
			1332.51	2.471E-03	%(P	8.598E-02	2.18E-02	G K
			1173.23	1.841E-02	& P	7.838E-02	2.11E-02	G K
Sr-85		-4.5597E-02						
			514.00	-4.560E-02	&(	1.139E-01	3.43E-02	G
Kr-85		-7.7123E+02						
			513.99	-7.712E+02	&(	1.927E+03	5.80E+02	G
Y-88		-1.3413E-03						
			1836.01	-1.341E-03	%(P	4.008E-02	5.44E-03	G K
			898.02	-1.437E-02	% P	8.636E-02	2.41E-02	G
NB-94		-3.0389E-03						
			871.10	-3.039E-03	%(	5.542E-02	1.52E-02	G K
			702.50	1.470E-02	&	6.919E-02	2.01E-02	G K
Ag-108M		-5.7741E-03						
			722.95	-5.774E-03	&(	6.773E-02	1.91E-02	G K
			614.37	1.449E-02	%	6.032E-02	1.76E-02	G
			433.93	1.068E-02	%	5.151E-02	1.50E-02	G
CD-109		2.0232E-01						
			88.04	2.023E-01	%(	2.189E+00	6.54E-01	G

Yankee Chemistry Spectrum name: 101F_12JAN2005_1350.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	1.3366E-02						
		391.71	1.337E-02	%(P	9.806E-02	2.85E-02	G K
		255.04	9.644E-01	%	2.795E+00	8.38E-01	G
SB-125	2.1661E-01						
		427.95	5.627E-02	&(	1.573E-01	4.69E-02	G K
		600.77	1.090E-01	%	3.063E-01	9.11E-02	G
		636.15	0.000E+00	%	6.211E-01	1.75E-01	G
		463.51	6.912E-01	(	5.371E-01	1.79E-01	G
		176.29	-1.602E-01	%	8.756E-01	2.61E-01	G
I-131	0.0000E+00						
		364.48	0.000E+00	%(	7.856E-01	2.26E-01	G K
		636.97	1.955E+00	%	1.007E+01	2.91E+00	G
		284.29	-2.101E-01	%	1.009E+01	2.94E+00	G
CS-134	1.8542E-03						
		604.66	1.854E-03	%(	1.971E-01	5.84E-02	G K
		795.76	-5.469E-03	%	8.205E-02	2.31E-02	G
		569.29	1.258E-01	%	4.035E-01	1.19E-01	G
		801.84	-1.548E-02	%	6.627E-01	1.81E-01	G
CS-137	2.0295E-01						
		661.62	2.029E-01	*(	7.796E-02	3.46E-02	G
CE-139	-6.4151E-03						
		165.85	-6.415E-03	%(P	7.977E-02	2.37E-02	G
EU-152	3.6965E-03						
		121.78	3.696E-03	&(	1.936E-01	5.74E-02	G K
		344.30	-3.002E-02	&	1.736E-01	5.08E-02	G
		1408.08	7.301E-02	&	2.788E-01	7.90E-02	G
		964.00	5.099E-01	&	7.118E-01	2.23E-01	G
		1112.07	7.959E-02	%	6.838E-01	1.94E-01	G
		778.90	-4.716E-03	%	4.897E-01	1.36E-01	G
EU-154	2.9855E-02						
		123.10	2.986E-02	%(	1.322E-01	3.96E-02	G K
		1274.80	3.981E-02	%	1.904E-01	5.38E-02	G
		723.30	2.518E-03	&	3.377E-01	9.44E-02	G
		1004.80	2.145E-01	%	3.116E-01	9.99E-02	G
EU-155	0.0000E+00						
		86.45	0.000E+00	%(	2.565E-01	7.64E-02	G K
		105.31	3.130E-02	&	2.762E-01	8.23E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	5.2216E-02						
		279.17	5.222E-02	%(P	8.415E-02	2.56E-02	G K
		72.87	-1.019E+00	%	2.624E+00	7.93E-01	G
		70.83	-2.038E+00	%	4.539E+00	1.38E+00	G
		82.50	-3.809E-01	&	5.330E+00	1.59E+00	G
TL-208	4.3741E-01						
		583.14	4.374E-01	(	5.761E-02	3.38E-02	G
		510.72	5.672E-01	+	3.136E-01	1.28E-01	G
PB-212	1.1038E+00						
		238.63	1.090E+00	(	1.372E-01	5.80E-02	G K
							Energy duplication
		77.11	1.138E+00	(	4.883E-01	1.59E-01	G
		74.81	1.584E+00	&	9.440E-01	2.99E-01	G
PB-214	7.1731E-01						
		351.99	6.969E-01	(	1.173E-01	5.44E-02	G K
		295.22	7.567E-01	(	2.315E-01	8.78E-02	G
							Energy duplication
		77.11	1.861E+00	+	7.986E-01	2.59E-01	G
		241.92	2.961E-01	%	9.961E-01	2.99E-01	G
BI-212	5.5195E-01						
		727.17	5.519E-01	(	4.477E-01	1.55E-01	G K
		1620.56	-1.057E-01	%	3.003E+00	8.02E-01	G
		785.42	1.239E+00	%	4.083E+00	1.21E+00	G
BI-214	8.4201E-01						
		609.32	8.244E-01	(	1.097E-01	6.35E-02	G K
		1764.51	8.931E-01	(	1.995E-01	1.55E-01	G
		1120.28	1.303E+00	+	6.165E-01	2.76E-01	G
RA-224	1.7325E+00						
		241.00	1.733E+00	(	1.762E+00	5.49E-01	G
RA-226	1.8000E+00						
		185.99	1.800E+00	*(	1.607E+00	5.05E-01	G
AC-228	1.2693E+00						
		911.07	1.235E+00	(	2.543E-01	1.37E-01	G K
		968.90	1.715E+00	+	4.104E-01	2.09E-01	G
		338.40	1.351E+00	@(	4.228E-01	1.75E-01	G
TH-227	-3.9071E-02						
		236.00	-3.907E-02	%(	5.022E-01	1.48E-01	G K
		256.25	2.320E-01	&	7.297E-01	2.18E-01	G

Yankee Chemistry Spectrum name: 101F_12JAN2005_1350.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-234	9.0581E-02						
		98.44	9.058E-02	%(	2.465E-01	7.44E-02	G K
		946.00	-7.397E-04	%	4.081E-01	1.14E-01	G
		131.28	-3.287E-02	&	3.021E-01	9.01E-02	G
		94.67	-1.453E-01	&	4.701E-01	1.42E-01	G
		883.24	-1.252E-01	%	5.529E-01	1.60E-01	G
		926.70	-1.325E-02	%	6.060E-01	1.67E-01	G
		569.26	1.817E-01	%	5.828E-01	1.73E-01	G
TH-234	1.8661E+00						
		63.29	1.410E+00	%(	2.924E+00	8.87E-01	G K
		92.80	2.017E+00	(	2.318E+00	7.14E-01	G
		92.38	2.381E+00	(	2.740E+00	8.44E-01	G
AM-241	1.3494E-03						
		59.54	1.349E-03	%(P	3.784E-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	5.3669E-02	7.8334E-02	7.8724E-01	7.8725E-01	6.208E-01
K-40		1.6571E+01	1.6571E+01	2.2960E+00	2.4796E+00	
MN-54	#A	3.0419E-02	3.2451E-02	5.7110E-02	5.7139E-02	5.821E-02
CO-57	#B	1.3933E-02	1.5015E-02	6.3244E-02	6.3249E-02	6.540E-02
CO-60	#B	2.4455E-03	2.4712E-03	6.5539E-02	6.5540E-02	8.508E-02
Sr-85	#A	-3.3395E-02	-4.5597E-02	1.0290E-01	1.0293E-01	8.345E-02
Kr-85	#A	-7.7106E+02	-7.7123E+02	1.7401E+03	1.7407E+03	1.927E+03
Y-88	#B	-1.1098E-03	-1.3413E-03	8.0478E-03	8.0481E-03	3.316E-02
NB-94	#B	-3.0389E-03	-3.0389E-03	4.5460E-02	4.5460E-02	5.542E-02
Ag-108M	#B	-5.7716E-03	-5.7741E-03	5.7318E-02	5.7319E-02	6.770E-02
CD-109	#A	1.9351E-01	2.0232E-01	1.9628E+00	1.9628E+00	2.094E+00
SN-113	#B	1.1215E-02	1.3366E-02	8.5469E-02	8.5472E-02	8.228E-02
SB-125	#F	2.1233E-01	2.1661E-01	1.6874E-01	1.6919E-01	1.542E-01
I-131	#B	0.0000E+00	0.0000E+00	6.7735E-01	6.7735E-01	6.374E-02
CS-134	#B	1.8052E-03	1.8542E-03	1.7521E-01	1.7521E-01	1.919E-01
CS-137	#	2.0257E-01	2.0295E-01	1.0394E-01	1.0457E-01	
CE-139	#A	-5.5389E-03	-6.4151E-03	7.3471E-02	7.3472E-02	6.888E-02
EU-152	#B	3.6804E-03	3.6965E-03	1.7210E-01	1.7210E-01	1.927E-01
EU-154	#B	2.9662E-02	2.9855E-02	1.1867E-01	1.1868E-01	1.313E-01
EU-155	#B	0.0000E+00	0.0000E+00	2.2928E-01	2.2928E-01	2.537E-01
HG-203	#B	3.3851E-02	5.2216E-02	7.6932E-02	7.6988E-02	5.455E-02
TL-208		4.3741E-01	4.3741E-01	1.0149E-01	1.0445E-01	
PB-212	#	1.1038E+00	1.1038E+00	1.7618E-01	1.8689E-01	1.372E-01
PB-214	#	7.1731E-01	7.1731E-01	1.5046E-01	1.5582E-01	1.173E-01
BI-212	#	5.5195E-01	5.5195E-01	4.6587E-01	4.6691E-01	4.477E-01
BI-214		8.4201E-01	8.4201E-01	1.9472E-01	2.0045E-01	
RA-224	#A	1.7325E+00	1.7325E+00	1.6468E+00	1.6497E+00	1.762E+00
RA-226	#	1.8000E+00	1.8000E+00	1.5163E+00	1.5197E+00	1.607E+00
AC-228		1.2693E+00	1.2693E+00	3.2427E-01	3.3211E-01	
TH-227	#B	-3.9071E-02	-3.9071E-02	4.4461E-01	4.4462E-01	5.022E-01
PA-234	#B	9.0581E-02	9.0581E-02	2.2309E-01	2.2315E-01	2.465E-01
TH-234	#B	1.8661E+00	1.8661E+00	1.5007E+00	1.5043E+00	2.924E+00
AM-241	#A	1.3492E-03	1.3494E-03	3.3601E-01	3.3601E-01	3.783E-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_12JAN2005_1350.An1

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

Total Activity (269.6 to 1999.1 keV) 1.9322250E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 1.9322624E+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_12JAN2005_1425.An1

Sample description
Detector 101 FSS-OOL-14-01-019-FB SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_12JAN2005_1425.An1

Acquisition information

Start time:	12-Jan-2005 14:17:18
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:	1.1830E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.1830E+03) = 8.4531E+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_12JAN2005_1425.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	14-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. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1221

***** 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	168.	14.59	1.00	1.654E-02	74.81	9.600	1.205E+00	PB212
76.87	83.	34.35	1.50	1.720E-02	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	2.947E-04	PB214
77.07	110.	21.90	1.01	1.720E-02	77.11	17.500	7.859E-01	PB212
					77.11	10.700	1.285E+00	PB214
129.09	49.	40.37	0.71	2.110E-02				
185.74	60.	37.02	1.33	1.860E-02				
185.74	60.	37.02	1.33	1.860E-02	185.99	3.280	1.128E+00	RA226
209.89	53.	40.74	1.09	1.718E-02				
238.65	486.	5.28	1.12	1.558E-02	238.63	43.100	8.266E-01	PB212
241.58	86.	20.85	1.12	1.542E-02	241.00	3.900	1.631E+00	RA224
					241.92	7.470	8.544E-01	PB214
269.39	70.	24.96	1.28	1.404E-02				
294.94	110.	20.20	1.02	1.293E-02	295.22	19.200	5.075E-01	PB214
300.05	38.	35.70	0.84	1.273E-02				
327.76	51.	30.28	0.81	1.170E-02				
338.37	124.	15.19	1.05	1.135E-02	338.40	12.010	1.041E+00	AC228
351.87	243.	9.32	1.12	1.093E-02	351.99	37.100	6.846E-01	PB214
462.79	26.	32.65	1.50	8.342E-03	463.51	10.000	3.669E-01	SB125
510.71	100.	17.52	1.65	7.591E-03				
510.71	100.	17.52	1.65	7.591E-03	510.72	22.500	6.675E-01	TL208
					514.00	99.270	2.079E-01	Sr85
582.90	129.	12.57	1.15	6.687E-03				
582.90	129.	12.57	1.15	6.687E-03	583.14	86.000	2.557E-01	TL208
609.21	138.	11.54	1.65	6.414E-03	609.32	46.090	5.337E-01	BI214
661.48	82.	17.57	1.79	5.939E-03	661.62	84.620	1.875E-01	CS137

727.31	27.	35.82	1.50	5.443E-03	727.17	11.800	PBC<MDA	BI212
860.43	24.	27.00	0.94	4.678E-03				
910.87	96.	14.24	1.29	4.447E-03	911.07	29.000	8.469E-01	AC228
967.64	74.	15.06	1.84	4.212E-03	968.90	17.460	1.143E+00	AC228
1119.96	54.	33.14	1.54	3.711E-03	1120.28	15.040	1.095E+00	BI214
1460.32	391.	5.22	1.80	2.943E-03	1460.75	10.700	1.418E+01	K40
1764.50	15.	39.01	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	
257.80	129.09	176.	54.	0.027	112.46	0.706	AC-228	
419.45	209.89	169.	53.	0.026	122.21	1.093	NP-239	s
538.50	269.39	98.	70.	0.035	74.87	1.277	AC-228	s
599.84	300.05	73.	38.	0.019	107.09	0.840	PB-212	
655.29	327.76	75.	51.	0.025	90.84	0.811	AC-228	
1021.35	510.71	106.	51.	0.026	95.25	1.647	TL-208	s
1721.16	860.43	9.	24.	0.012	80.99	0.940	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	215.	168.	0.084	43.77	1.005D
PB-212	153.79	77.11	237.	110.	0.055	65.69	1.006A
PB-214	153.79	77.11	432.	83.	0.041	103.05	1.499A
RA-226	371.71	186.03	243.	63.	0.031	111.63	1.499s
PB-212	476.96	238.63	86.	486.	0.243	15.84	1.121D
RA-224	483.29	241.79	307.	75.	0.037	105.59	1.499s
PB-214	483.54	241.92	97.	87.	0.044	57.52	1.124D
PB-214	589.62	294.94	143.	110.	0.055	60.61	1.020
AC-228	676.53	338.37	83.	124.	0.062	45.58	1.050
PB-214	703.54	351.87	93.	243.	0.121	27.97	1.117
SB-125	925.48	462.79	24.	26.	0.013	97.94	1.499
TL-208	1021.74	510.90	62.	49.	0.024	80.91	1.499s
Sr-85	1022.06	511.06	48.	40.	0.020	87.49	1.499
TL-208	1166.17	583.08	34.	127.	0.063	33.09	1.499
BI-214	1218.45	609.21	40.	138.	0.069	34.61	1.645
CS-137	1323.05	661.48	44.	82.	0.041	52.70	1.792s
BI-212	1454.78	727.31	32.	27.	0.013	107.47	1.499s
AC-228	1822.08	910.87	26.	96.	0.048	42.72	1.290
AC-228	1935.69	967.64	15.	74.	0.037	45.18	1.835s
BI-214	2240.52	1119.96	56.	54.	0.027	99.42	1.535
K-40	2921.65	1460.32	6.	391.	0.195	15.66	1.798
BI-214	3530.45	1764.50	10.	15.	0.007	117.04	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	Code	MDA Value pCi/gm	COMMENTS
BE-7		2.3753E-01					
			477.56	2.375E-01	&(	6.685E-01 1.99E-01	G
K-40		1.4179E+01					
			1460.75	1.418E+01	(	5.193E-01 7.40E-01	G
MN-54		-9.1166E-03					
			834.81	-9.117E-03	&(	7.611E-02 2.16E-02	G
CO-57		-1.6227E-03					
			122.07	-1.623E-03	%(P	5.668E-02 1.66E-02	G K
			136.43	-4.228E-02	&	5.217E-01 1.55E-01	G
CO-60		-2.3428E-02					
			1332.51	-2.343E-02	%(P	6.182E-02 8.92E-03	G K
			1173.23	3.029E-03	% P	9.192E-02 2.40E-02	G K
Sr-85		8.3333E-02					
			514.00	8.333E-02	&(	7.293E-02 2.43E-02	G
Kr-85		2.4634E+02					
			513.99	2.463E+02	&(	1.321E+03 3.83E+02	G
Y-88		7.9419E-03					
			1836.01	7.942E-03	%(P	9.136E-02 2.38E-02	G K
			898.02	-2.010E-03	& P	7.641E-02 2.01E-02	G
NB-94		4.3559E-03					
			871.10	4.356E-03	%(	7.050E-02 1.96E-02	G K
			702.50	-8.942E-03	%	5.983E-02 1.70E-02	G K
Ag-108M		-1.2513E-02					
			722.95	-1.251E-02	&(	7.340E-02 2.11E-02	G K
			614.37	-1.114E-02	%	7.079E-02 2.04E-02	G
			433.93	2.977E-02	&	4.690E-02 1.46E-02	G
CD-109		3.6783E-01					
			88.04	3.678E-01	%(	1.510E+00 4.51E-01	G
SN-113		-8.7663E-04					
			391.71	-8.766E-04	%(P	1.020E-01 2.91E-02	G K
			255.04	-1.112E-01	%	2.594E+00 7.54E-01	G

Yankee Chemistry Spectrum name: 101F_12JAN2005_1425.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.3674E-01						
		427.95	5.897E-02	%(	1.605E-01	4.79E-02	G K
		600.77	-7.074E-02	%	3.433E-01	9.97E-02	G
		636.15	1.397E-02	&	4.185E-01	1.14E-01	G
		463.51	3.669E-01	(	3.544E-01	1.20E-01	G
		176.29	2.102E-01	%	7.901E-01	2.36E-01	G
I-131	-1.1091E-01						
		364.48	-1.109E-01	%(	7.825E-01	2.28E-01	G K
		636.97	1.115E-01	&	8.224E+00	2.24E+00	G
		284.29	-8.447E-01	%	1.013E+01	2.96E+00	G
CS-134	1.4647E-02						
		604.66	1.465E-02	&(	4.807E-02	1.41E-02	G K
		795.76	4.355E-02	%	6.818E-02	2.14E-02	G
		569.29	-6.074E-03	&	3.348E-01	9.28E-02	G
		801.84	-8.832E-02	%	7.233E-01	2.03E-01	G
CS-137	1.8746E-01						
		661.62	1.875E-01	(	7.634E-02	3.29E-02	G
CE-139	9.7045E-05						
		165.85	9.704E-05	%(P	6.868E-02	2.02E-02	G
EU-152	-1.7078E-02						
		121.78	-1.708E-02	%(	1.745E-01	5.17E-02	G K
		344.30	4.700E-02	%	1.474E-01	4.37E-02	G
		1408.08	2.198E-02	%	2.816E-01	7.35E-02	G
		964.00	5.878E-02	%	6.843E-01	1.95E-01	G
		1112.07	2.743E-02	&	9.138E-01	2.60E-01	G
		778.90	0.000E+00	&	6.649E-01	1.88E-01	G
EU-154	-1.7693E-02						
		123.10	-1.769E-02	&(	1.277E-01	3.80E-02	G K
		1274.80	3.568E-04	&	2.481E-01	6.73E-02	G
		723.30	-9.390E-02	&	3.570E-01	1.04E-01	G
		1004.80	-3.733E-02	&	3.472E-01	9.54E-02	G
EU-155	-3.9336E-03						
		86.45	-3.934E-03	%(	2.121E-01	6.29E-02	G K
		105.31	3.237E-02	%	2.354E-01	6.99E-02	G
HG-203	-1.6463E-02						
		279.17	-1.646E-02	%(P	9.973E-02	2.87E-02	G K
		72.87	4.431E-01	%	1.844E+00	5.52E-01	G
		70.83	-7.744E-01	&	4.003E+00	1.20E+00	G
		82.50	-1.012E+00	%	4.394E+00	1.31E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.6711E-01						
		583.14	2.517E-01	(	5.958E-02	2.78E-02	G
		510.72	3.259E-01	(	2.635E-01	8.79E-02	G
PB-212	8.1482E-01						
		238.63	8.266E-01	(	7.823E-02	4.37E-02	G K
							Energy duplication
		77.11	4.173E-01	}	2.824E-01	9.14E-02	G
		74.81	1.205E+00	+	5.110E-01	1.76E-01	G
PB-214	7.1526E-01						
		351.99	6.846E-01	(	1.344E-01	6.38E-02	G K
		295.22	5.075E-01	-	2.689E-01	1.02E-01	G
							Energy duplication
		77.11	5.127E-01	}	6.176E-01	1.76E-01	G
		241.92	8.676E-01	(	4.817E-01	1.66E-01	G
BI-212	4.7337E-01						
		727.17	4.734E-01	@(	5.181E-01	1.70E-01	G K
		1620.56	1.299E-01	%	2.035E+00	5.10E-01	G
		785.42	8.499E-01	&	3.266E+00	9.50E-01	G
BI-214	5.0791E-01						
		609.32	5.337E-01	(	1.242E-01	6.16E-02	G K
		1764.51	4.331E-01	?(	4.955E-01	1.69E-01	G
		1120.28	1.095E+00	+	7.660E-01	3.63E-01	G
RA-224	1.4145E+00						
		241.00	1.415E+00	(	1.601E+00	4.98E-01	G
RA-226	1.1794E+00						
		185.99	1.179E+00	*(	1.411E+00	4.39E-01	G
AC-228	9.7520E-01						
		911.07	8.469E-01	(	2.361E-01	1.21E-01	G K
		968.90	1.143E+00	*(	3.261E-01	1.72E-01	G
		338.40	1.041E+00	(	3.781E-01	1.58E-01	G
TH-227	-2.0578E-01						
		236.00	-2.058E-01	%(	5.427E-01	1.63E-01	G K
		256.25	-5.520E-02	&	6.795E-01	1.98E-01	G
PA-234	4.7533E-02						
		98.44	4.753E-02	%(	2.117E-01	6.32E-02	G K
		946.00	3.501E-03	&	3.572E-01	9.77E-02	G
		131.28	-2.808E-02	%	2.600E-01	7.72E-02	G
		94.67	-3.075E-02	%	3.240E-01	9.59E-02	G
		883.24	-6.960E-02	%	4.865E-01	1.36E-01	G
		926.70	7.219E-02	&	5.370E-01	1.49E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-8.487E-03 &   4.835E-01 1.34E-01 G

TH-234       7.6344E-01
                           63.29 7.634E-01 %(  2.587E+00 7.77E-01 G K
                           92.80 1.416E+00 %   2.003E+00 6.15E-01 G
                           92.38 7.466E-01 %   2.091E+00 6.30E-01 G

AM-241      -7.7152E-02
                           59.54-7.715E-02 %(P 3.538E-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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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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	1.6270E-01	2.3753E-01	5.9632E-01	5.9647E-01	4.579E-01
K-40		1.4179E+01	1.4179E+01	2.2206E+00	2.3607E+00	
MN-54	#A	-8.5452E-03	-9.1166E-03	6.4665E-02	6.4667E-02	7.134E-02
CO-57	#B	-1.5057E-03	-1.6227E-03	1.7331E-01	1.7331E-01	5.259E-02
CO-60	#B	-2.3183E-02	-2.3428E-02	3.4644E-01	3.4644E-01	6.117E-02

Sr-85	#	6.1019E-02	8.3333E-02	7.2904E-02	7.3056E-02	5.340E-02
Kr-85	#A	2.4629E+02	2.4634E+02	1.1503E+03	1.1504E+03	1.321E+03
Y-88	#B	6.5704E-03	7.9419E-03	7.1268E-02	7.1270E-02	7.558E-02
NB-94	#B	4.3559E-03	4.3559E-03	5.8923E-02	5.8924E-02	7.050E-02
Ag-108M	#B	-1.2508E-02	-1.2513E-02	6.3220E-02	6.3224E-02	7.337E-02
CD-109	#A	3.5179E-01	3.6783E-01	1.3543E+00	1.3544E+00	1.444E+00
SN-113	#B	-7.3547E-04	-8.7663E-04	1.7655E-01	1.7655E-01	8.561E-02
SB-125	#B	1.3404E-01	1.3674E-01	1.3393E-01	1.3416E-01	1.574E-01
I-131	#B	-8.9825E-03	-1.1091E-01	6.8393E-01	6.8396E-01	6.337E-02
CS-134	#B	1.4259E-02	1.4647E-02	4.2192E-02	4.2200E-02	4.680E-02
CS-137		1.8712E-01	1.8746E-01	9.8795E-02	9.9361E-02	
CE-139	#A	8.3781E-05	9.7045E-05	6.0455E-02	6.0455E-02	5.929E-02
EU-152	#B	-1.7004E-02	-1.7078E-02	1.5519E-01	1.5519E-01	1.737E-01
EU-154	#B	-1.7578E-02	-1.7693E-02	1.1387E-01	1.1387E-01	1.268E-01
EU-155	#B	-3.8899E-03	-3.9336E-03	1.8875E-01	1.8875E-01	2.098E-01
HG-203	#B	-1.0669E-02	-1.6463E-02	2.5365E-01	2.5365E-01	6.463E-02
TL-208	#	2.6711E-01	2.6711E-01	8.8377E-02	8.9657E-02	5.958E-02
PB-212		8.1482E-01	8.1482E-01	1.2911E-01	1.3707E-01	
PB-214		7.1526E-01	7.1526E-01	2.0006E-01	2.0411E-01	
BI-212	#A	4.7337E-01	4.7337E-01	5.0875E-01	5.0946E-01	5.181E-01
BI-214		5.0791E-01	5.0791E-01	1.7578E-01	1.7811E-01	
RA-224	#A	1.4145E+00	1.4145E+00	1.4936E+00	1.4957E+00	1.601E+00
RA-226	#A	1.1794E+00	1.1794E+00	1.3166E+00	1.3182E+00	1.411E+00
AC-228		9.7520E-01	9.7520E-01	2.5062E-01	2.5661E-01	
TH-227	#B	-2.0578E-01	-2.0578E-01	4.9049E-01	4.9063E-01	5.427E-01
PA-234	#B	4.7533E-02	4.7533E-02	1.8973E-01	1.8975E-01	2.117E-01
TH-234	#B	7.6344E-01	7.6344E-01	2.3299E+00	2.3303E+00	2.587E+00
AM-241	#A	-7.7142E-02	-7.7152E-02	3.2483E-01	3.2485E-01	3.537E-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 (269.1 to 1999.1 keV) 1.7379244E+01 pCi/gm
Total Decayed Activity (269.1 to 1999.1 keV) 1.7379589E+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_12JAN2005_1500.An1

Sample description
Detector 101 FSS-OOL-14-01-014-F SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_12JAN2005_1500.An1

Acquisition information
Start time: 12-Jan-2005 14:54:24
Live time: 2000
Real time: 2003
Dead time: 0.13 %
Detector ID: 1

Detector system
Det 101- DSPE-633

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

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

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

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

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.5360E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5360E+03) =
6.5104E+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_12JAN2005_1500.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	14-Dec-2004 14:52:00
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: 0.2178

***** 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	221.	13.56	1.00	1.643E-02				
74.71	221.	13.56	1.00	1.643E-02	74.81	9.600	1.222E+00	PB212
77.16	277.	15.82	1.50	1.720E-02	77.11	10.700	1.323E+00	PB214
					77.11	17.500	8.087E-01	PB212
77.16	277.	15.82	1.50	1.720E-02	77.11	10.700	1.323E+00	PB214
					77.11	17.500	8.087E-01	PB212
87.29	120.	22.42	1.01	1.924E-02	86.45	32.740	1.702E-01	EU155
					88.04	3.790	1.502E+00	CD109
89.53	80.	33.79	1.02	1.954E-02				
93.21	127.	21.37	1.02	1.995E-02	92.38	2.570	2.182E+00	TH234
					92.80	3.000	1.865E+00	TH234
186.23	115.	28.90	0.81	1.857E-02	185.99	3.280	1.657E+00	RA226
238.65	652.	4.65	1.12	1.558E-02				
238.65	652.	4.65	1.12	1.558E-02	238.63	43.100	8.549E-01	PB212
241.71	127.	17.03	1.12	1.542E-02	241.00	3.900	1.860E+00	RA224
					241.92	7.470	9.743E-01	PB214
269.84	85.	32.05	1.20	1.402E-02				
295.27	203.	9.51	1.16	1.292E-02	295.22	19.200	7.184E-01	PB214
299.72	41.	35.27	1.16	1.274E-02				
327.10	58.	29.19	1.30	1.173E-02				
338.28	112.	19.49	1.27	1.135E-02	338.40	12.010	7.242E-01	AC228
351.89	318.	7.14	1.18	1.093E-02				
351.89	318.	7.14	1.18	1.093E-02	351.99	37.100	6.907E-01	PB214
462.69	37.	29.73	1.06	8.356E-03				
462.69	37.	29.73	1.06	8.356E-03	463.51	10.000	3.981E-01	SB125
510.27	101.	16.61	1.42	7.597E-03	510.72	22.500	5.218E-01	TL208

582.87	186.	10.23	1.52	6.687E-03	583.14	86.000	2.847E-01	TL208
609.10	232.	9.94	1.11	6.415E-03	609.32	46.090	6.900E-01	BI214
661.34	42.	30.83	1.47	5.940E-03	661.62	84.620	7.438E-02	CS137
727.41	29.	40.27	1.50	5.443E-03	727.17	11.800	PBC<MDA	BI212
910.83	139.	14.23	1.21	4.448E-03	911.07	29.000	9.484E-01	AC228
968.70	46.	29.22	1.62	4.212E-03	968.90	17.460	5.482E-01	AC228
1120.07	58.	26.64	1.40	3.711E-03	1120.28	15.040	9.080E-01	BI214

Yankee Chemistry Spectrum name: 101F_12JAN2005_1500.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1460.33	604.	4.10	1.91	2.943E-03	1460.75	10.700	1.687E+01	K40
1763.51	38.	16.22	2.12	2.481E-03	1764.51	15.920	8.463E-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	
178.64	89.71	328.	80.	0.040	101.38	1.015	PB-214	lD
477.00	238.56	135.	652.	0.326	13.96	1.122	PB-212	D
483.13	241.62	172.	127.	0.064	51.08	1.124	PB-214	D
539.40	269.84	226.	85.	0.042	96.16	1.204	AC-228	s
599.15	299.70	133.	51.	0.026	110.18	1.189	TH-227	s
653.98	327.10	98.	58.	0.029	87.58	1.295	AC-228	s
1934.09	966.84	43.	117.	0.058	42.72	1.807	TB-160	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	149.02	74.73	958.	180.	0.090	76.29	1.499
PB-214	153.79	77.11	819.	277.	0.138	47.45	1.499D
PB-212	153.79	77.11	819.	277.	0.138	47.45	1.499D
EU-155	173.93	87.18	758.	129.	0.064	94.59	1.499
CD-109	173.42	86.92	687.	106.	0.053	109.06	1.499
TH-234	185.88	93.15	743.	140.	0.070	86.35	1.499s
TH-234	185.85	93.13	715.	143.	0.071	83.30	1.499s
RA-226	371.91	186.13	422.	75.	0.037	121.48	1.499s
PB-212	476.98	238.64	345.	526.	0.263	19.90	1.499
RA-224	482.94	241.62	484.	98.	0.049	100.17	1.499
PB-214	590.21	295.23	178.	186.	0.093	37.62	1.499
AC-228	676.35	338.28	148.	112.	0.056	60.52	1.275
PB-214	703.57	351.89	96.	303.	0.151	22.04	1.499
SB-125	925.18	462.64	67.	38.	0.019	103.90	1.499
TL-208	1020.48	510.27	63.	101.	0.051	49.83	1.420s
TL-208	1165.74	582.87	55.	186.	0.093	30.69	1.523s
BI-214	1218.24	609.10	83.	232.	0.116	29.83	1.110
CS-137	1322.76	661.34	48.	42.	0.021	92.50	1.465
BI-212	1454.97	727.41	54.	29.	0.015	120.82	1.499s
AC-228	1822.01	910.83	63.	139.	0.069	42.68	1.209

Yankee Chemistry Spectrum name: 101F_12JAN2005_1500.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1937.81	968.70	67.	46.	0.023	87.66	1.616s
BI-214	2240.73	1120.07	49.	58.	0.029	79.92	1.404s
K-40	2921.68	1460.33	2.	604.	0.302	12.29	1.909
BI-214	3528.45	1763.51	0.	38.	0.019	48.67	2.123

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

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

Nuclide Name	Nuclide Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.3660E-01					
			477.56	1.366E-01	%(	6.723E-01 1.97E-01	G
K-40		1.6870E+01					
			1460.75	1.687E+01	(	2.732E-01 6.91E-01	G
MN-54		-8.4333E-04					
			834.81	-8.433E-04	%(	5.269E-02 1.44E-02	G
CO-57		-2.4108E-02					
			122.07	-2.411E-02	%(P	5.793E-02 1.75E-02	G K
			136.43	6.924E-02	&	4.817E-01 1.44E-01	G
CO-60		1.9960E-02					
			1332.51	1.996E-02	%(P	6.999E-02 1.91E-02	G K
			1173.23	1.036E-03	% P	7.790E-02 2.06E-02	G K
Sr-85		-4.1714E-02					
			514.00	-4.171E-02	%(	8.964E-02 2.71E-02	G
Kr-85		-7.0646E+02					
			513.99	-7.065E+02	%(	1.518E+03 4.60E+02	G
Y-88		-1.1028E-03					
			1836.01	-1.103E-03	%(P	7.497E-02 1.88E-02	G K
			898.02	-1.407E-02	% P	8.184E-02 2.32E-02	G
NB-94		8.5517E-03					
			871.10	8.552E-03	%(	5.040E-02 1.43E-02	G K
			702.50	9.076E-03	&	4.564E-02 1.31E-02	G K
Ag-108M		-1.7219E-03					
			722.95	-1.722E-03	&(	7.248E-02 2.06E-02	G K
			614.37	-8.269E-03	&	7.161E-02 2.08E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		433.93	-4.567E-03	&	5.572E-02	1.62E-02	G
CD-109	1.3286E+00						
		88.04	1.329E+00	(	1.567E+00	4.83E-01	G
SN-113	1.2284E-02						
		391.71	1.228E-02	&(P	9.218E-02	2.69E-02	G K
		255.04	-1.859E-01	%	2.419E+00	7.10E-01	G
SB-125	1.0080E-01						
		427.95	-2.419E-03	%(	1.620E-01	4.65E-02	G K
		600.77	4.221E-02	%	2.352E-01	6.76E-02	G
		636.15	6.222E-02	&	4.067E-01	1.16E-01	G
		463.51	4.063E-01	(	4.385E-01	1.41E-01	G
		176.29	1.028E-01	&	7.250E-01	2.16E-01	G
I-131	-7.1224E-02						
		364.48	-7.122E-02	%(	7.004E-01	2.04E-01	G K
		636.97	0.000E+00	&	1.085E+01	3.10E+00	G
		284.29	-1.381E+00	%	9.077E+00	2.68E+00	G
CS-134	-1.6618E-02						
		604.66	-1.662E-02	&(	6.690E-02	1.97E-02	G K
		795.76	-9.343E-03	&	7.160E-02	2.05E-02	G
		569.29	4.871E-02	&	2.867E-01	8.25E-02	G
		801.84	-1.515E-01	%	6.240E-01	1.81E-01	G
CS-137	7.4381E-02						
		661.62	7.438E-02	(	6.116E-02	2.29E-02	G
CE-139	6.0310E-03						
		165.85	6.031E-03	%(P	6.948E-02	2.06E-02	G
EU-152	-2.5438E-02						
		121.78	-2.544E-02	%(	1.637E-01	4.89E-02	G K
		344.30	-1.784E-02	%	1.786E-01	5.23E-02	G
		1408.08	4.998E-02	%	2.501E-01	6.97E-02	G
		964.00	3.468E-01	&	6.410E-01	1.96E-01	G
		1112.07	1.367E-01	%	4.643E-01	1.36E-01	G
		778.90	-9.992E-02	%	4.853E-01	1.41E-01	G
EU-154	1.1016E-03						
		123.10	1.102E-03	&(	1.249E-01	3.71E-02	G K
		1274.80	-2.016E-02	&	2.093E-01	5.86E-02	G
		723.30	3.819E-02	%	3.269E-01	9.41E-02	G
		1004.80	7.067E-03	%	3.678E-01	1.02E-01	G

Yankee Chemistry Spectrum name: 101F_12JAN2005_1500.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.8302E-01						
		86.45	1.830E-01	(	1.864E-01	5.77E-02	G K
		105.31	4.319E-02	%	2.371E-01	7.09E-02	G
HG-203	-7.8703E-03						
		279.17	-7.870E-03	&(P	7.962E-02	2.29E-02	G K
		72.87	-9.063E-01	&	2.187E+00	6.62E-01	G
		70.83	1.233E+00	%	3.156E+00	9.53E-01	G
		82.50	-9.613E-01	&	4.408E+00	1.32E+00	G
TL-208	2.8466E-01						
		583.14	2.847E-01	*(	5.704E-02	2.91E-02	G
		510.72	5.218E-01	+	2.040E-01	8.66E-02	G
PB-212	7.2377E-01						
		238.63	6.893E-01	(	1.171E-01	4.57E-02	G K
							Energy duplication
		77.11	8.087E-01	(	3.977E-01	1.28E-01	G
		74.81	9.976E-01	&	8.142E-01	2.54E-01	G
PB-214	6.5778E-01						
		351.99	6.576E-01	(	1.051E-01	4.83E-02	G K
		295.22	6.581E-01	(	2.300E-01	8.25E-02	G
							Energy duplication
		77.11	1.323E+00	+	6.505E-01	2.09E-01	G
		241.92	9.974E-02	%	9.321E-01	2.78E-01	G
BI-212	3.9747E-01						
		727.17	3.975E-01	(	5.052E-01	1.60E-01	G K
		1620.56	3.088E-01	%	2.513E+00	6.92E-01	G
		785.42	3.963E-02	&	2.578E+00	7.14E-01	G
BI-214	7.6484E-01						
		609.32	6.900E-01	(	1.346E-01	6.86E-02	G K
		1764.51	8.463E-01	(	1.641E-01	1.37E-01	G
		1120.28	9.080E-01	@(	5.590E-01	2.42E-01	G
RA-224	1.4278E+00						
		241.00	1.428E+00	(	1.537E+00	4.77E-01	G
RA-226	1.0806E+00						
		185.99	1.081E+00	*(	1.421E+00	4.38E-01	G
AC-228	9.4836E-01						
		911.07	9.484E-01	(	2.708E-01	1.35E-01	G K
		968.90	5.482E-01	&	4.878E-01	1.60E-01	G
		338.40	7.235E-01	-	3.833E-01	1.46E-01	G

Yankee Chemistry Spectrum name: 101F_12JAN2005_1500.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-1.8477E-01						
		236.00	-1.848E-01	%(	4.955E-01	1.49E-01	G K
		256.25	-1.502E-01	%	6.571E-01	1.96E-01	G
PA-234	-9.9642E-02						
		98.44	-9.964E-02	%(	1.978E-01	6.01E-02	G K
		946.00	-3.326E-02	&	3.465E-01	9.85E-02	G
		131.28	-4.882E-02	%	2.427E-01	7.26E-02	G
		94.67	2.407E-02	&	3.660E-01	1.09E-01	G
		883.24	-1.384E-02	&	4.894E-01	1.36E-01	G
		926.70	1.730E-01	%	4.319E-01	1.29E-01	G
		569.26	7.036E-02	&	4.142E-01	1.19E-01	G
TH-234	1.8875E+00						
		63.29	1.371E+00	%(	2.490E+00	7.58E-01	G K
		92.80	2.106E+00	*(	1.877E+00	5.85E-01	G
		92.38	2.417E+00	*(	2.238E+00	6.96E-01	G
AM-241	1.7673E-03						
		59.54	1.767E-03	%(P	3.290E-01	9.75E-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: 101F_12JAN2005_1500.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	9.3751E-02	1.3660E-01	5.9038E-01	5.9043E-01	4.614E-01
K-40		1.6870E+01	1.6870E+01	2.0727E+00	2.2813E+00	
MN-54	#A	-7.9074E-04	-8.4333E-04	4.3320E-02	4.3320E-02	4.940E-02
CO-57	#B	-2.2378E-02	-2.4108E-02	5.5545E-02	5.5561E-02	5.377E-02
CO-60	#B	1.9752E-02	1.9960E-02	5.7266E-02	5.7277E-02	6.926E-02
Sr-85	#A	-3.0594E-02	-4.1714E-02	8.1441E-02	8.1475E-02	6.575E-02
Kr-85	#A	-7.0631E+02	-7.0646E+02	1.3792E+03	1.3798E+03	1.518E+03
Y-88	#B	-9.1329E-04	-1.1028E-03	2.7844E-02	2.7844E-02	6.208E-02
NB-94	#B	8.5517E-03	8.5517E-03	4.2933E-02	4.2935E-02	5.040E-02
Ag-108M	#B	-1.7212E-03	-1.7219E-03	6.1826E-02	6.1826E-02	7.245E-02
CD-109	#A	1.2709E+00	1.3286E+00	1.4489E+00	1.4508E+00	1.499E+00
SN-113	#B	1.0315E-02	1.2284E-02	8.0786E-02	8.0789E-02	7.741E-02
SB-125	#B	9.8819E-02	1.0080E-01	1.0473E-01	1.0488E-01	1.588E-01
I-131	#B	-5.8447E-03	-7.1224E-02	6.1341E-01	6.1342E-01	5.748E-02
CS-134	#B	-1.6181E-02	-1.6618E-02	5.9209E-02	5.9216E-02	6.514E-02
CS-137		7.4245E-02	7.4381E-02	6.8804E-02	6.8932E-02	
CE-139	#A	5.2107E-03	6.0310E-03	6.1948E-02	6.1949E-02	6.003E-02
EU-152	#B	-2.5328E-02	-2.5438E-02	1.4664E-01	1.4665E-01	1.630E-01
EU-154	#B	1.0945E-03	1.1016E-03	1.1116E-01	1.1116E-01	1.240E-01
EU-155	#A	1.8100E-01	1.8302E-01	1.7312E-01	1.7342E-01	1.844E-01
HG-203	#B	-5.1122E-03	-7.8703E-03	5.9065E-01	5.9065E-01	5.172E-02
TL-208	#	2.8466E-01	2.8466E-01	8.7355E-02	8.8823E-02	
PB-212	#	7.2377E-01	7.2377E-01	1.4401E-01	1.4971E-01	1.171E-01
PB-214	#	6.5778E-01	6.5778E-01	1.4339E-01	1.4813E-01	1.051E-01
BI-212	#A	3.9747E-01	3.9747E-01	4.8021E-01	4.8074E-01	5.052E-01
BI-214		7.6484E-01	7.6484E-01	2.2817E-01	2.3223E-01	
RA-224	#A	1.4278E+00	1.4278E+00	1.4302E+00	1.4325E+00	1.537E+00
RA-226	#A	1.0805E+00	1.0806E+00	1.3126E+00	1.3141E+00	1.421E+00
AC-228		9.4836E-01	9.4836E-01	4.0473E-01	4.0827E-01	
TH-227	#B	-1.8477E-01	-1.8477E-01	4.4817E-01	4.4829E-01	4.955E-01
PA-234	#B	-9.9642E-02	-9.9642E-02	1.8016E-01	1.8025E-01	1.978E-01
TH-234	#B	1.8875E+00	1.8875E+00	1.2876E+00	1.2919E+00	2.490E+00
AM-241	#A	1.7670E-03	1.7673E-03	2.9258E-01	2.9258E-01	3.290E-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_12JAN2005_1500.An1

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

Total Activity (269.6 to 1999.1 keV) 1.8941671E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 1.8941807E+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_12JAN2005_1540.An1

Sample description
Detector 101 FSS-OOL-14-01-004-F SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_12JAN2005_1540.An1

Acquisition information
Start time: 12-Jan-2005 15:30:41
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: 1.3000E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.3000E+03) = 7.6923E+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_12JAN2005_1540.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	14-Dec-2004 15:16:00
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: 0.2440

***** 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	166.	15.85	1.00	1.657E-02	74.81	9.600	1.085E+00	PB212
77.41	245.	11.01	1.01	1.740E-02	77.11	17.500	8.467E-01	PB212
					77.11	10.700	1.385E+00	PB214
86.71	81.	29.39	1.01	1.914E-02	86.45	32.740	1.369E-01	EU155
93.05	100.	23.97	1.02	1.993E-02	92.38	2.570	2.034E+00	TH234
					92.80	3.000	1.738E+00	TH234
129.25	85.	34.15	1.04	2.109E-02				
129.25	85.	34.15	1.04	2.109E-02	131.28	20.000	2.098E-01	PA234
186.10	81.	24.37	1.06	1.858E-02	185.99	3.280	1.383E+00	RA226
208.42	78.	34.78	0.86	1.727E-02				
238.70	473.	5.42	1.12	1.558E-02				
238.70	473.	5.42	1.12	1.558E-02	238.63	43.100	7.322E-01	PB212
241.90	109.	17.06	1.12	1.541E-02	241.00	3.900	1.883E+00	RA224
					241.92	7.470	9.864E-01	PB214
270.55	56.	35.42	0.65	1.399E-02				
277.39	69.	29.22	1.10	1.368E-02				
295.27	172.	9.63	1.16	1.292E-02				
295.27	172.	9.63	1.16	1.292E-02	295.22	19.200	7.194E-01	PB214
299.85	47.	26.28	1.16	1.274E-02				
338.10	112.	17.17	1.38	1.136E-02	338.40	12.010	8.511E-01	AC228
351.85	274.	9.24	1.15	1.093E-02				
351.85	274.	9.24	1.15	1.093E-02	351.99	37.100	7.017E-01	PB214
463.13	45.	37.93	1.15	8.348E-03				
463.13	45.	37.93	1.15	8.348E-03	463.51	10.000	5.720E-01	SB125
510.42	72.	21.25	1.15	7.595E-03				
510.42	72.	21.25	1.15	7.595E-03	510.72	22.500	4.382E-01	TL208

562.62	27.	34.55	0.61	6.916E-03				
583.02	168.	10.46	1.06	6.686E-03				
583.02	168.	10.46	1.06	6.686E-03	583.14	86.000	3.038E-01	TL208
609.19	193.	9.57	1.52	6.414E-03	609.32	46.090	6.781E-01	BI214
727.35	55.	22.64	1.70	5.442E-03	727.17	11.800	8.869E-01	BI212
911.10	114.	13.49	1.91	4.446E-03	911.07	29.000	9.190E-01	AC228
968.11	87.	15.79	1.24	4.215E-03	968.90	17.460	1.235E+00	AC228
1120.20	50.	22.63	1.00	3.711E-03	1120.28	15.040	9.313E-01	BI214
1460.37	463.	4.75	1.66	2.943E-03	1460.75	10.700	1.527E+01	K40
1764.10	33.	17.41	1.63	2.481E-03	1764.51	15.920	8.684E-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	74.91	262.	166.	0.083	47.54	1.005	PB-214	D
154.39	77.86	242.	245.	0.123	33.03	1.007	PB-214	D
416.51	208.42	243.	78.	0.039	104.35	0.859	LU-177	s
477.10	238.60	92.	473.	0.236	16.25	1.122	PB-212	D
483.50	241.80	119.	109.	0.055	51.18	1.124	PB-214	D
540.83	270.55	135.	56.	0.028	106.27	0.646	AC-228	s
554.51	277.39	127.	68.	0.034	78.53	1.100	TL-208	
599.34	299.80	59.	49.	0.024	79.87	1.295	TH-227	s
1125.23	562.62	24.	27.	0.013	96.72	0.613	AS-76	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	664.	143.	0.072	80.41	1.499
PB-212	153.79	77.11	643.	199.	0.100	57.99	1.499D
PB-214	153.79	77.11	643.	199.	0.100	57.99	1.499D
EU-155	173.69	87.06	590.	104.	0.052	103.56	1.499s
TH-234	185.15	92.79	570.	120.	0.060	88.60	1.499
TH-234	185.09	92.75	559.	123.	0.061	86.23	1.499
PA-234	257.77	129.08	265.	63.	0.032	115.75	1.499s
RA-226	371.91	186.13	309.	81.	0.040	97.87	1.499
PB-212	476.90	238.60	294.	331.	0.165	27.48	1.499
RA-224	483.07	241.68	319.	91.	0.045	89.21	1.499
PB-214	483.23	241.76	347.	67.	0.034	123.29	1.499
PB-214	590.19	295.22	95.	139.	0.070	39.06	1.499D
AC-228	675.98	338.10	106.	112.	0.056	51.50	1.378s
PB-214	703.45	351.83	97.	226.	0.113	27.21	1.499
SB-125	925.86	462.98	50.	37.	0.019	94.22	1.499s
TL-208	1021.70	510.88	63.	46.	0.023	84.74	1.499s
TL-208	1166.10	583.04	27.	151.	0.075	28.53	1.499
BI-214	1218.41	609.19	46.	193.	0.096	28.72	1.516
BI-212	1454.86	727.35	34.	55.	0.027	67.93	1.703s
AC-228	1822.55	911.10	35.	114.	0.057	40.47	1.914s
AC-228	1936.63	968.11	29.	87.	0.044	47.36	1.241

Yankee Chemistry Spectrum name: 101F_12JAN2005_1540.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	2240.98	1120.20	26.	50.	0.025	67.88	1.004s
K-40	2921.75	1460.37	5.	463.	0.231	14.25	1.665
BI-214	3529.65	1764.10	0.	33.	0.016	52.22	1.632

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		-1.2788E-02					
			477.56	-1.279E-02	%(	4.854E-01 1.33E-01	G
K-40		1.5273E+01					
			1460.75	1.527E+01	(	4.470E-01 7.25E-01	G
MN-54		9.4442E-03					
			834.81	9.444E-03	%(	5.315E-02 1.50E-02	G
CO-57		-9.0671E-03					
			122.07	-9.067E-03	%(P	5.726E-02 1.70E-02	G K
			136.43	1.558E-01	%	4.680E-01 1.41E-01	G
CO-60		8.8421E-03					
			1332.51	8.842E-03	%(P	7.503E-02 1.90E-02	G K
			1173.23	2.950E-02	% P	8.770E-02 2.47E-02	G K
Sr-85		-2.0005E-02					
			514.00	-2.000E-02	&(	8.888E-02 2.62E-02	G
Kr-85		-3.3876E+02					
			513.99	-3.388E+02	&(	1.505E+03 4.43E+02	G
Y-88		-1.3031E-03					
			1836.01	-1.303E-03	%(P	3.893E-02 5.28E-03	G K
			898.02	-1.021E-02	& P	7.955E-02 2.19E-02	G
NB-94		-3.9430E-03					
			871.10	-3.943E-03	%(	6.531E-02 1.82E-02	G K
			702.50	-1.315E-02	&	6.334E-02 1.84E-02	G K
Ag-108M		2.2354E-03					
			722.95	2.235E-03	%(	1.403E-01 4.09E-02	G K
			614.37	-1.308E-02	%	6.573E-02 1.91E-02	G
			433.93	5.898E-03	%	4.436E-02 1.27E-02	G

Yankee Chemistry Spectrum name: 101F_12JAN2005_1540.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	8.1135E-02						
		88.04	8.114E-02	&(	1.846E+00	5.49E-01	G
SN-113	7.6896E-05						
		391.71	7.690E-05	&(P	7.827E-02	2.20E-02	G K
		255.04	7.112E-01	&	2.225E+00	6.64E-01	G
SB-125	1.4529E-01						
		427.95	3.459E-02	%(	1.643E-01	4.81E-02	G K
		600.77	8.254E-02	%	2.780E-01	8.17E-02	G
		636.15	-3.024E-02	%	4.616E-01	1.29E-01	G
		463.51	4.730E-01	*(	4.520E-01	1.49E-01	G
		176.29	1.584E-01	&	7.449E-01	2.22E-01	G
I-131	2.9384E-01						
		364.48	2.938E-01	%(	6.033E-01	1.83E-01	G K
		636.97	-1.354E+00	%	8.936E+00	2.55E+00	G
		284.29	2.874E+00	%	8.426E+00	2.52E+00	G
CS-134	-1.3143E-02						
		604.66	-1.314E-02	%(	7.594E-02	2.22E-02	G K
		795.76	2.712E-03	&	5.847E-02	1.59E-02	G
		569.29	4.100E-03	%	3.070E-01	8.51E-02	G
		801.84	-9.456E-02	%	7.354E-01	2.09E-01	G
CS-137	1.6136E-02						
		661.62	1.614E-02	%(	6.592E-02	1.92E-02	G
CE-139	1.9252E-02						
		165.85	1.925E-02	&(P	6.524E-02	1.95E-02	G
EU-152	-2.5665E-02						
		121.78	-2.566E-02	%(	1.611E-01	4.80E-02	G K
		344.30	-1.937E-03	%	1.592E-01	4.55E-02	G
		1408.08	-4.236E-02	&	3.463E-01	9.54E-02	G
		964.00	4.757E-03	&	7.711E-01	2.20E-01	G
		1112.07	8.360E-02	&	5.914E-01	1.68E-01	G
		778.90	-9.230E-02	%	4.787E-01	1.38E-01	G
EU-154	-4.9206E-03						
		123.10	-4.921E-03	%(	1.072E-01	3.16E-02	G K
		1274.80	-4.281E-02	&	2.413E-01	6.87E-02	G
		723.30	-9.230E-02	%	3.777E-01	1.11E-01	G
		1004.80	-3.358E-02	%	3.413E-01	9.42E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.7448E-01						
		86.45	1.745E-01	(	1.948E-01	6.02E-02	G K
		105.31	-1.072E-02	%	2.262E-01	6.69E-02	G
HG-203	-6.3478E-03						
		279.17	-6.348E-03	&(P	8.571E-02	2.44E-02	G K
		72.87	-5.191E-01	%	2.164E+00	6.50E-01	G
		70.83	-6.917E-01	%	3.809E+00	1.14E+00	G
		82.50	-1.083E+00	&	4.696E+00	1.41E+00	G
TL-208	2.7470E-01						
		583.14	2.727E-01	(	4.905E-02	2.59E-02	G
		510.72	2.825E-01	*(	2.412E-01	7.98E-02	G
PB-212	5.1221E-01						
		238.63	5.122E-01	(	1.279E-01	4.69E-02	G K
							Energy duplication
		77.11	6.887E-01	+	4.175E-01	1.33E-01	G
		74.81	9.365E-01	&	8.036E-01	2.51E-01	G
PB-214	5.8354E-01						
		351.99	5.791E-01	(	1.245E-01	5.25E-02	G K
							Energy duplication
		295.22	5.832E-01	(	2.013E-01	7.59E-02	G
							Energy duplication
		77.11	1.126E+00	+	6.828E-01	2.18E-01	G
		241.92	6.064E-01	(	8.086E-01	2.49E-01	G
BI-212	8.8693E-01						
		727.17	8.869E-01	@(	4.849E-01	2.01E-01	G K
		1620.56	4.728E-01	%	1.469E+00	4.19E-01	G
		785.42	-3.947E-01	%	3.138E+00	8.91E-01	G
BI-214	6.7809E-01						
		609.32	6.781E-01	(	1.209E-01	6.49E-02	G K
		1764.51	8.684E-01	+	1.939E-01	1.51E-01	G
		1120.28	9.313E-01	+	4.930E-01	2.11E-01	G
RA-224	1.5656E+00						
		241.00	1.566E+00	&(	1.482E+00	4.66E-01	G
RA-226	1.3815E+00						
		185.99	1.381E+00	(	1.443E+00	4.51E-01	G
AC-228	9.9951E-01						
		911.07	9.190E-01	(	2.441E-01	1.24E-01	G K
		968.90	1.235E+00	(	3.906E-01	1.95E-01	G
		338.40	8.511E-01	(	3.872E-01	1.46E-01	G

Yankee Chemistry Spectrum name: 101F_12JAN2005_1540.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-9.1427E-02						
		236.00	-9.143E-02	%(	4.082E-01	1.21E-01	G K
		256.25	0.000E+00	&	7.169E-01	2.09E-01	G
PA-234	4.4672E-02						
		98.44	-4.390E-02	%(	2.229E-01	6.67E-02	G K
		946.00	9.600E-02	&	3.155E-01	9.23E-02	G
		131.28	1.558E-01	&(	1.940E-01	6.01E-02	G
		94.67	-6.301E-02	&	3.992E-01	1.19E-01	G
		883.24	3.096E-02	&	4.692E-01	1.29E-01	G
		926.70	0.000E+00	%	5.881E-01	1.61E-01	G
		569.26	3.346E-03	%	4.450E-01	1.23E-01	G
TH-234	1.8085E+00						
		63.29	1.137E+00	%(	2.591E+00	7.84E-01	G K
		92.80	2.134E+00	(	1.966E+00	6.13E-01	G
		92.38	2.449E+00	(	2.322E+00	7.23E-01	G
AM-241	-3.9430E-02						
		59.54	-3.943E-02	%(P	3.458E-01	1.03E-01	G

(- This peak used in the nuclide activity average.

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

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

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

- -

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

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-8.7753E-03	-1.2788E-02	3.9980E-01	3.9980E-01	3.331E-01
K-40		1.5273E+01	1.5273E+01	2.1759E+00	2.3408E+00	
MN-54	#A	8.8551E-03	9.4442E-03	4.4937E-02	4.4940E-02	4.984E-02
CO-57	#B	-8.4164E-03	-9.0671E-03	6.1059E-02	6.1061E-02	5.315E-02
CO-60	#B	8.7503E-03	8.8421E-03	5.7033E-02	5.7035E-02	7.425E-02
Sr-85	#A	-1.4671E-02	-2.0005E-02	7.8453E-02	7.8461E-02	6.518E-02
Kr-85	#A	-3.3868E+02	-3.3876E+02	1.3285E+03	1.3286E+03	1.505E+03
Y-88	#B	-1.0791E-03	-1.3031E-03	7.8187E-03	7.8190E-03	3.224E-02
NB-94	#B	-3.9430E-03	-3.9430E-03	5.4656E-02	5.4656E-02	6.531E-02
Ag-108M	#B	2.2345E-03	2.2354E-03	1.2270E-01	1.2270E-01	1.402E-01
CD-109	#A	7.7614E-02	8.1135E-02	1.6475E+00	1.6475E+00	1.766E+00
SN-113	#B	6.4570E-05	7.6896E-05	6.6116E-02	6.6116E-02	6.572E-02
SB-125	#B	1.4243E-01	1.4529E-01	1.3689E-01	1.3714E-01	1.611E-01
I-131	#B	2.4095E-02	2.9384E-01	5.4957E-01	5.4982E-01	4.947E-02
CS-134	#B	-1.2796E-02	-1.3143E-02	6.6482E-02	6.6486E-02	7.394E-02
CS-137	#A	1.6106E-02	1.6136E-02	5.7582E-02	5.7590E-02	6.580E-02
CE-139	#A	1.6633E-02	1.9252E-02	5.8649E-02	5.8659E-02	5.637E-02
EU-152	#B	-2.5554E-02	-2.5665E-02	1.4386E-01	1.4386E-01	1.604E-01
EU-154	#B	-4.8889E-03	-4.9206E-03	9.4861E-02	9.4861E-02	1.065E-01
EU-155	#A	1.7255E-01	1.7448E-01	1.8069E-01	1.8095E-01	1.927E-01
HG-203	#B	-4.1227E-03	-6.3478E-03	9.8835E-01	9.8835E-01	5.567E-02
TL-208	#	2.7470E-01	2.7470E-01	7.8385E-02	7.9907E-02	4.905E-02
PB-212	#	5.1221E-01	5.1221E-01	1.4076E-01	1.4371E-01	1.279E-01
PB-214	#	5.8354E-01	5.8354E-01	1.5876E-01	1.6215E-01	1.245E-01
BI-212	#	8.8693E-01	8.8693E-01	6.0251E-01	6.0459E-01	
BI-214		6.7809E-01	6.7809E-01	1.9474E-01	1.9847E-01	
RA-224	#	1.5656E+00	1.5656E+00	1.3966E+00	1.3994E+00	1.482E+00
RA-226	#A	1.3814E+00	1.3815E+00	1.3521E+00	1.3543E+00	1.442E+00
AC-228		9.9951E-01	9.9951E-01	2.6928E-01	2.7514E-01	
TH-227	#B	-9.1427E-02	-9.1427E-02	3.6382E-01	3.6386E-01	4.082E-01
PA-234	#B	4.4672E-02	4.4672E-02	5.1710E-02	5.1769E-02	2.229E-01
TH-234	#B	1.8085E+00	1.8085E+00	1.4534E+00	1.4569E+00	2.591E+00
AM-241	#A	-3.9425E-02	-3.9430E-02	3.2226E-01	3.2226E-01	3.458E-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_12JAN2005_1540.An1

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

Total Activity (270.1 to 1999.1 keV) 1.7837940E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.7837940E+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_12JAN2005_1615.An1

Sample description
Detector 101 FSS-OOL-14-01-016-F SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_12JAN2005_1615.An1

Acquisition information
Start time: 12-Jan-2005 16:06:38
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: 1.3360E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.3360E+03) =
7.4850E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

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

Yankee Chemistry Spectrum name: 101F_12JAN2005_1615.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	14-Dec-2004 15:10:00
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. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1405

***** 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
74.60	179.	15.82	1.00	1.651E-02				
74.60	179.	15.82	1.00	1.651E-02	74.81	9.600	1.142E+00	PB212
77.10	311.	9.81	1.01	1.723E-02	77.11	10.700	1.710E+00	PB214
					77.11	17.500	1.046E+00	PB212
84.43	78.	30.59	1.56	1.877E-02				
92.85	98.	36.85	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.663E+00	TH234
92.86	96.	38.18	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.626E+00	TH234
186.04	110.	28.93	1.29	1.858E-02	185.99	3.280	1.827E+00	RA226
209.21	44.	37.10	0.76	1.722E-02				
238.12	162.	17.73	1.50	1.540E-02				
238.12	162.	17.73	1.50	1.540E-02	238.63	43.100	PBC<MDA	PB212
238.61	574.	4.91	1.12	1.558E-02				
238.61	574.	4.91	1.12	1.558E-02	238.63	43.100	8.655E-01	PB212
241.06	76.	32.98	1.12	1.545E-02	241.00	3.900	1.281E+00	RA224
295.20	164.	11.08	1.05	1.292E-02				
295.20	164.	11.08	1.05	1.292E-02	295.22	19.200	6.687E-01	PB214
300.46	40.	40.26	0.89	1.271E-02				
338.31	106.	15.16	1.32	1.135E-02	338.40	12.010	7.829E-01	AC228
351.91	282.	8.11	1.16	1.093E-02				
351.91	282.	8.11	1.16	1.093E-02	351.99	37.100	7.043E-01	PB214
510.41	106.	18.55	1.24	7.595E-03	510.72	22.500	6.278E-01	TL208
582.87	175.	9.54	1.22	6.687E-03	583.14	86.000	3.079E-01	TL208
609.03	188.	10.12	1.31	6.416E-03	609.32	46.090	6.437E-01	BI214
661.56	81.	22.69	1.50	5.938E-03	661.62	84.620	1.630E-01	CS137

727.41	68.	22.08	2.07	5.443E-03	727.17	11.800	1.071E+00	BI212
911.11	106.	13.94	1.45	4.446E-03	911.07	29.000	8.354E-01	AC228
968.29	93.	15.43	1.62	4.214E-03	968.90	17.460	1.285E+00	AC228
1120.05	57.	21.77	1.27	3.711E-03	1120.28	15.040	1.037E+00	BI214
1460.31	476.	4.71	2.04	2.943E-03	1460.75	10.700	1.529E+01	K40
1763.89	30.	18.26	1.20	2.481E-03	1764.51	15.920	7.682E-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	
148.78	74.72	313.	179.	0.090	47.45	1.005	BI-207	D
153.78	77.22	311.	311.	0.156	29.44	1.006	PB-214	D
418.09	209.21	125.	44.	0.022	111.29	0.764	AC-228	
476.93	238.56	110.	574.	0.287	14.72	1.121	PB-212	D
481.83	241.01	279.	76.	0.038	98.94	1.123	RA-224	D
600.67	300.46	101.	40.	0.020	116.15	0.889	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	149.23	74.83	766.	154.	0.077	79.91	1.499
PB-214	153.79	77.11	654.	261.	0.130	45.57	1.499D
PB-212	153.79	77.11	654.	261.	0.130	45.57	1.499D
TH-234	185.29	92.86	623.	96.	0.048	114.55	1.499s
TH-234	185.27	92.85	605.	98.	0.049	110.56	1.499s
RA-226	371.72	186.03	336.	104.	0.052	80.21	1.499s
PB-212	476.91	238.60	317.	458.	0.229	21.64	1.499
PB-214	475.94	238.12	331.	162.	0.081	53.20	1.499s
PB-214	590.16	295.20	130.	145.	0.072	41.72	1.499
AC-228	676.41	338.31	72.	106.	0.053	45.47	1.323
PB-214	703.64	351.92	75.	264.	0.132	23.12	1.499
TL-208	1020.77	510.41	78.	106.	0.053	55.66	1.235s
TL-208	1165.75	582.87	40.	175.	0.087	28.63	1.219
BI-214	1218.10	609.03	53.	188.	0.094	30.37	1.308
CS-137	1323.20	661.56	67.	81.	0.040	68.07	1.497
BI-212	1454.97	727.41	45.	68.	0.034	66.25	2.067s
AC-228	1822.56	911.11	32.	106.	0.053	41.81	1.449
AC-228	1936.99	968.29	34.	93.	0.047	46.28	1.618s
BI-214	2240.70	1120.05	29.	57.	0.029	65.32	1.269s
K-40	2921.65	1460.31	6.	476.	0.238	14.12	2.039s
BI-214	3529.21	1763.89	0.	30.	0.015	54.77	1.199s

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		-1.4440E-01						
			477.56	-1.444E-01	&(	8.071E-01	2.36E-01	G
K-40		1.5286E+01						
			1460.75	1.529E+01	@(	4.598E-01	7.19E-01	G
MN-54		-8.8540E-03						
			834.81	-8.854E-03	&(	7.214E-02	2.05E-02	G
CO-57		-3.5482E-03						
			122.07	-3.548E-03	&(P	6.357E-02	1.88E-02	G K
			136.43	-9.576E-03	&	5.088E-01	1.51E-01	G
CO-60		-1.4057E-02						
			1332.51	-1.406E-02	&(P	8.139E-02	1.94E-02	G K
			1173.23	2.211E-02	& P	8.948E-02	2.49E-02	G K
Sr-85		-3.4352E-02						
			514.00	-3.435E-02	%(	9.689E-02	2.90E-02	G
Kr-85		-5.8144E+02						
			513.99	-5.814E+02	%(	1.640E+03	4.91E+02	G
Y-88		-1.2682E-03						
			1836.01	-1.268E-03	%(P	3.789E-02	5.14E-03	G K
			898.02	-1.312E-03	% P	6.697E-02	1.77E-02	G
NB-94		3.0338E-03						
			871.10	3.034E-03	&(	5.476E-02	1.50E-02	G K
			702.50	1.884E-02	%	5.418E-02	1.61E-02	G K
Ag-108M		-1.3836E-02						
			722.95	-1.384E-02	%(	7.172E-02	2.08E-02	G K
			614.37	-5.172E-03	%	5.785E-02	1.64E-02	G
			433.93	-1.327E-02	%	5.593E-02	1.65E-02	G
CD-109		5.6168E-02						
			88.04	5.617E-02	%(	1.874E+00	5.58E-01	G
SN-113		2.3367E-02						
			391.71	2.337E-02	%(P	9.067E-02	2.67E-02	G K
			255.04	5.998E-01	%	2.558E+00	7.59E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.6191E-02						
		427.95	1.619E-02	%(	1.810E-01	5.24E-02	G K
		600.77	0.000E+00	%	3.543E-01	1.00E-01	G
		636.15	-5.265E-02	%	4.550E-01	1.29E-01	G
		463.51	2.039E-01	%	5.561E-01	1.66E-01	G
		176.29	-1.597E-01	&	6.017E-01	1.79E-01	G
I-131	-4.1748E-03						
		364.48	-4.175E-03	%(	6.760E-01	1.93E-01	G K
		636.97	-8.700E-01	%	8.871E+00	2.51E+00	G
		284.29	-1.451E+00	&	1.029E+01	3.03E+00	G
CS-134	-3.5083E-03						
		604.66	-3.508E-03	%(	1.627E-01	4.81E-02	G K
		795.76	-1.591E-02	&	7.808E-02	2.26E-02	G
		569.29	-1.114E-01	%	4.028E-01	1.19E-01	G
		801.84	-1.665E-01	%	7.724E-01	2.24E-01	G
CS-137	1.6297E-01						
		661.62	1.630E-01	(	8.251E-02	3.70E-02	G
CE-139	1.0105E-02						
		165.85	1.010E-02	%(P	6.501E-02	1.93E-02	G
EU-152	3.4973E-02						
		121.78	3.497E-02	%(	1.442E-01	4.31E-02	G K
		344.30	-5.202E-03	%	1.709E-01	4.93E-02	G
		1408.08	4.492E-02	%	2.660E-01	7.28E-02	G
		964.00	2.533E-01	&	6.162E-01	1.85E-01	G
		1112.07	1.041E-02	&	5.235E-01	1.43E-01	G
		778.90	-3.941E-02	&	4.447E-01	1.25E-01	G
EU-154	-7.7963E-03						
		123.10	-7.796E-03	&(	1.227E-01	3.64E-02	G K
		1274.80	1.001E-01	%	1.943E-01	5.96E-02	G
		723.30	-2.238E-03	%	2.904E-01	8.05E-02	G
		1004.80	8.743E-02	%	3.238E-01	9.35E-02	G
EU-155	9.2121E-02						
		86.45	9.212E-02	%(	2.041E-01	6.18E-02	G K
		105.31	6.201E-02	%	2.420E-01	7.26E-02	G
HG-203	-2.4020E-02						
		279.17	-2.402E-02	%(P	9.307E-02	2.72E-02	G K
		72.87	-6.892E-01	&	2.307E+00	6.95E-01	G
		70.83	-7.478E-01	&	3.669E+00	1.10E+00	G
		82.50	-1.747E+00	%	4.688E+00	1.42E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.0792E-01						
		583.14	3.079E-01	(	5.663E-02	2.94E-02	G
		510.72	6.278E-01	+	2.598E-01	1.16E-01	G
PB-212	6.9059E-01						
		238.63	6.906E-01	(	1.291E-01	4.98E-02	G K
							Energy duplication
		77.11	8.759E-01	+	4.094E-01	1.33E-01	G
		74.81	9.818E-01	&	8.387E-01	2.62E-01	G
PB-214	6.3611E-01						
		351.99	6.599E-01	(	1.078E-01	5.09E-02	G K
		295.22	5.902E-01	(	2.279E-01	8.21E-02	G
							Energy duplication
		77.11	1.433E+00	+	6.696E-01	2.18E-01	G
		241.92	1.424E+00	+	7.697E-01	2.53E-01	G
BI-212	1.0709E+00						
		727.17	1.071E+00	*(	5.350E-01	2.36E-01	G K
		1620.56	-3.857E-02	&	1.988E+00	4.96E-01	G
		785.42	-5.100E-01	%	3.041E+00	8.71E-01	G
BI-214	6.7568E-01						
		609.32	6.437E-01	(	1.253E-01	6.51E-02	G K
		1764.51	7.682E-01	(	1.887E-01	1.40E-01	G
		1120.28	1.037E+00	+	5.024E-01	2.26E-01	G
RA-224	1.0230E+00						
		241.00	1.023E+00	%(	1.630E+00	4.98E-01	G
RA-226	1.7303E+00						
		185.99	1.730E+00	*(	1.463E+00	4.63E-01	G
AC-228	8.2002E-01						
		911.07	8.354E-01	(	2.296E-01	1.16E-01	G K
		968.90	1.285E+00	+	4.088E-01	1.98E-01	G
		338.40	7.829E-01	(	3.125E-01	1.19E-01	G
TH-227	-1.9445E-01						
		236.00	-1.945E-01	%(	5.332E-01	1.61E-01	G K
		256.25	-1.491E-01	%	7.127E-01	2.12E-01	G
PA-234	5.5392E-02						
		98.44	5.539E-02	%(	2.095E-01	6.28E-02	G K
		946.00	2.264E-03	%	3.336E-01	9.17E-02	G
		131.28	-6.596E-02	%	2.639E-01	7.91E-02	G
		94.67	-1.107E-01	%	4.108E-01	1.23E-01	G
		883.24	1.938E-03	&	4.843E-01	1.32E-01	G
		926.70	-3.380E-02	%	5.671E-01	1.57E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-1.613E-01 %   5.819E-01 1.72E-01 G

TH-234       1.3100E+00
                           63.29 6.476E-01 %(  2.653E+00 7.95E-01 G K
                           92.80 1.663E+00  (  1.989E+00 6.13E-01 G
                           92.38 1.903E+00  (  2.361E+00 7.27E-01 G

AM-241      -6.3001E-02
                           59.54-6.300E-02 %(P 3.532E-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	-9.9051E-02	-1.4440E-01	7.0761E-01	7.0766E-01	5.536E-01
K-40	#	1.5286E+01	1.5286E+01	2.1578E+00	2.3242E+00	
MN-54	#A	-8.3012E-03	-8.8540E-03	6.1611E-02	6.1613E-02	6.764E-02
CO-57	#B	-3.2933E-03	-3.5482E-03	8.9027E-02	8.9027E-02	5.901E-02
CO-60	#B	-1.3911E-02	-1.4057E-02	3.0247E-01	3.0247E-01	8.054E-02

Sr-85	#A	-2.5184E-02	-3.4352E-02	8.7001E-02	8.7023E-02	7.103E-02
Kr-85	#A	-5.8132E+02	-5.8144E+02	1.4728E+03	1.4731E+03	1.640E+03
Y-88	#B	-1.0500E-03	-1.2682E-03	7.6094E-03	7.6098E-03	3.137E-02
NB-94	#B	3.0338E-03	3.0338E-03	4.5125E-02	4.5125E-02	5.476E-02
Ag-108M	#B	-1.3830E-02	-1.3836E-02	6.2333E-02	6.2338E-02	7.169E-02
CD-109	#A	5.3729E-02	5.6168E-02	1.6729E+00	1.6729E+00	1.793E+00
SN-113	#B	1.9618E-02	2.3367E-02	8.0132E-02	8.0142E-02	7.612E-02
SB-125	#B	1.5872E-02	1.6191E-02	1.5709E-01	1.5709E-01	1.775E-01
I-131	#B	-3.4148E-04	-4.1748E-03	5.8039E-01	5.8039E-01	5.530E-02
CS-134	#B	-3.4158E-03	-3.5083E-03	1.4426E-01	1.4426E-01	1.584E-01
CS-137		1.6267E-01	1.6297E-01	1.1094E-01	1.1132E-01	
CE-139	#A	8.7289E-03	1.0105E-02	5.7937E-02	5.7939E-02	5.616E-02
EU-152	#B	3.4821E-02	3.4973E-02	1.2927E-01	1.2929E-01	1.436E-01
EU-154	#B	-7.7459E-03	-7.7963E-03	1.0918E-01	1.0918E-01	1.219E-01
EU-155	#B	9.1103E-02	9.2121E-02	1.8552E-01	1.8559E-01	2.019E-01
HG-203	#B	-1.5593E-02	-2.4020E-02	1.5078E-01	1.5078E-01	6.042E-02
TL-208		3.0792E-01	3.0792E-01	8.8170E-02	8.9870E-02	
PB-212	#	6.9059E-01	6.9059E-01	1.4943E-01	1.5444E-01	1.291E-01
PB-214	#	6.3611E-01	6.3611E-01	1.4708E-01	1.5141E-01	1.078E-01
BI-212	#	1.0709E+00	1.0709E+00	7.0948E-01	7.1206E-01	
BI-214		6.7568E-01	6.7568E-01	2.0522E-01	2.0874E-01	
RA-224	#A	1.0230E+00	1.0230E+00	1.4948E+00	1.4960E+00	1.630E+00
RA-226	#	1.7303E+00	1.7303E+00	1.3879E+00	1.3914E+00	1.463E+00
AC-228		8.2002E-01	8.2002E-01	2.5324E-01	2.5744E-01	
TH-227	#B	-1.9445E-01	-1.9445E-01	4.8178E-01	4.8190E-01	5.332E-01
PA-234	#B	5.5392E-02	5.5392E-02	1.8854E-01	1.8856E-01	2.095E-01
TH-234	#B	1.3100E+00	1.3100E+00	1.4483E+00	1.4502E+00	2.653E+00
AM-241	#A	-6.2993E-02	-6.3001E-02	3.2490E-01	3.2492E-01	3.531E-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) 1.8323116E+01 pCi/gm
Total Decayed Activity (295.1 to 1999.1 keV) 1.8323414E+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_13JAN2005_1635.An1

Sample description
Detector 101 FSS-OOL-14-01-005-F SOIL

Spectrum Filename: C:\GammaVision\Spectra\101F_13JAN2005_1635.An1

Acquisition information

Start time:	13-Jan-2005 16:26:57
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:	1.7190E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.7190E+03) = 5.8173E+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	14-Dec-2004 15:18:00
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: 0.1656

********** 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	
96.72	48.59	172.	82.	0.041	112.29	1.225	EU-155	s
173.91	87.08	292.	143.	0.072	56.55	1.014	PB-214	D
179.42	89.83	312.	129.	0.065	63.61	1.016	PB-214	D
418.52	209.47	163.	84.	0.042	72.77	1.101	AC-228	D
540.03	270.15	104.	78.	0.039	94.05	1.005	AC-228	s
654.89	327.56	84.	84.	0.042	92.58	1.265	AC-228	s
736.65	368.25	45.	23.	0.012	136.59	1.212	KR-89	D
1125.35	562.68	21.	17.	0.009	139.51	0.600	AS-76	s
1536.52	768.16	27.	27.	0.014	108.01	1.323	BI-214	M
1589.41	794.51	11.	44.	0.022	55.55	1.502	AC-228	D

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	195.	45.	0.023	137.37	0.994D
TH-234	126.14	63.29	291.	43.	0.021	175.30	0.997D
TA-182	134.66	67.55	376.	38.	0.019	345.75	0.679s
HG-203	145.31	72.87	420.	39.	0.020	226.47	1.003D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PB-212	149.19	74.81	366.	308.	0.154	31.41	1.005D
BI-207	149.51	74.97	486.	0.	0.000	0.00	0.000D
PB-214	153.79	77.11	410.	425.	0.213	24.87	1.006D
PB-212	153.79	77.11	562.	0.	0.000	283.60	0.452D
CE-144	159.81	80.12	278.	40.	0.020	183.14	1.009D
EU-155	172.48	86.45	379.	0.	0.000	0.00	1.013D
NP-237	172.56	86.49	331.	48.	0.024	167.52	1.013D
CD-109	175.66	88.04	491.	36.	0.018	266.57	1.014D
TH-234	184.34	92.38	453.	0.	0.000	0.00	1.017D
TH-234	185.18	92.80	314.	142.	0.071	58.67	1.018D
NP-237	191.32	95.87	280.	26.	0.013	278.57	1.020D
Cm-243	198.69	99.55	280.	44.	0.022	166.41	1.023D
Cm-243	207.11	103.76	297.	24.	0.012	314.86	1.026D
EU-155	210.21	105.31	302.	46.	0.023	166.50	1.027D
TE-132	225.65	113.03	180.	78.	0.039	108.65	1.159
TE-132	232.20	116.30	186.	0.	0.000	0.00	1.404D
Cm-243	232.28	116.34	300.	134.	0.067	98.46	0.606s
EU-152	243.16	121.78	299.	18.	0.009	408.88	1.038D
CO-57	243.74	122.07	318.	0.	0.000	0.00	1.039D
EU-154	245.80	123.10	236.	33.	0.016	204.37	1.039D
CE-144	266.67	133.53	200.	40.	0.020	157.16	1.047D
CO-57	272.48	136.43	172.	26.	0.013	224.47	1.049D
U-235	287.14	143.76	223.	40.	0.020	165.33	1.054D
CE-141	290.52	145.45	255.	32.	0.016	215.22	1.055D
TE-131	299.07	149.72	242.	0.	0.000	0.00	1.058D
U-235	326.34	163.35	201.	53.	0.027	120.21	1.068D
CE-139	331.34	165.85	201.	49.	0.025	128.98	1.070D
SB-125	355.11	177.73	150.	66.	0.033	124.82	0.923s
U-235	371.10	185.72	320.	305.	0.152	5.09	1.084A
RA-226	371.64	185.99	192.	0.	0.000	5886.42	1.401A
U-235	410.29	205.31	111.	11.	0.006	401.75	1.098D
TE-132	457.36	228.84	99.	61.	0.031	105.14	1.901s
TH-227	471.70	236.00	151.	24.	0.012	224.50	1.120D
PB-212	476.96	238.63	128.	795.	0.398	12.23	1.122D
RA-224	481.70	241.00	144.	78.	0.039	73.39	1.752A
PB-214	483.54	241.92	186.	104.	0.052	7.71	1.124A
SN-113	509.79	255.04	120.	9.	0.005	524.82	1.133D
TH-227	512.21	256.25	130.	11.	0.005	468.19	1.134D
Cm-243	554.93	277.60	88.	60.	0.030	76.85	1.149D
HG-203	558.07	279.17	115.	0.	0.000	0.00	1.150D
J-131	569.13	284.69	42.	21.	0.010	173.21	0.542s
PB-214	590.44	295.35	87.	231.	0.116	27.89	1.249s
CR-51	637.00	318.62	90.	12.	0.006	396.86	0.000s
AC-228	676.44	338.33	97.	166.	0.083	37.14	1.295
EU-152	688.02	344.12	32.	3.	0.002	750.56	1.137
PB-214	703.67	351.94	116.	358.	0.179	21.91	1.239
J-131	728.77	364.48	41.	2.	0.001	1268.96	1.210D
SN-113	782.86	391.51	33.	27.	0.014	137.35	1.000s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-125	854.75	427.44	54.	13.	0.007	280.74	0.514s
Ag-108M	869.63	434.88	31.	15.	0.008	182.38	1.101
TE-131	905.17	452.64	38.	3.	0.002	888.82	0.479s
SB-125	926.24	463.17	50.	47.	0.024	91.06	0.683s
TE-131	986.00	493.04	27.	16.	0.008	159.96	0.813s
TL-208	1021.38	510.72	70.	67.	0.033	64.87	1.311D
Kr-85	1027.92	513.99	56.	2.	0.001	1492.07	1.313D
CS-134	1138.00	569.00	25.	3.	0.002	728.01	0.000s
BI-207	1139.38	569.69	28.	0.	0.000	0.00	1.351
TL-208	1166.21	583.10	51.	248.	0.124	24.79	1.301s
SB-125	1201.57	600.77	27.	1.	0.000	2284.18	1.372D
CS-134	1209.35	604.66	35.	10.	0.005	272.43	1.374D
BI-214	1218.68	609.32	25.	289.	0.145	19.13	1.378D
Ag-108M	1228.78	614.37	28.	0.	0.000	0.00	0.652D
SB-125	1272.36	636.15	28.	2.	0.001	1464.49	1.396D
J-131	1274.00	636.97	28.	2.	0.001	1146.16	1.396D
AG-110M	1315.58	657.75	41.	5.	0.003	521.32	1.410D
CS-137	1323.33	661.62	40.	13.	0.006	224.03	1.413D
NB-94	1403.82	701.85	30.	19.	0.009	157.10	1.000
Ag-108M	1446.05	722.95	39.	5.	0.002	587.60	1.454D
EU-154	1446.75	723.30	49.	0.	0.000	0.00	1.454D
BI-212	1454.49	727.17	31.	54.	0.027	59.87	1.457D
EU-152	1560.38	780.09	16.	9.	0.004	229.76	0.750s
BI-212	1571.08	785.43	16.	8.	0.004	237.17	1.093
CS-134	1591.75	795.76	50.	0.	0.000	0.00	1.502D
CS-134	1603.91	801.84	27.	7.	0.004	332.13	1.506D
CO-58	1623.33	811.55	11.	1.	0.000	1326.65	1.499
MN-54	1670.33	835.03	8.	1.	0.001	1081.67	0.450s
MN-56	1699.64	849.68	23.	6.	0.003	436.21	1.250
NB-94	1740.29	869.99	20.	24.	0.012	113.27	0.720s
AG-110M	1772.24	885.96	19.	9.	0.005	233.76	0.440s
Y-88	1795.00	897.33	7.	0.	0.000	0.00	0.250s
AC-228	1822.17	910.91	37.	134.	0.067	35.41	1.478
AG-110M	1877.37	938.50	18.	12.	0.006	188.75	0.546s
EU-152	1928.41	964.00	27.	19.	0.010	131.42	1.612D
AC-228	1938.21	968.90	23.	96.	0.048	37.24	1.616D
EU-154	2015.85	1007.70	32.	16.	0.008	220.04	0.714s
BI-207	2127.56	1063.52	23.	13.	0.006	204.96	0.644s
FE-59	2198.57	1099.00	6.	1.	0.001	994.99	0.656s
EU-152	2224.72	1112.07	21.	8.	0.004	257.97	1.708D
ZN-65	2231.62	1115.52	33.	6.	0.003	444.83	1.710D
BI-214	2241.15	1120.28	31.	71.	0.035	49.11	1.713D
TA-182	2243.15	1121.28	103.	0.	0.000	18223.17	1.713D
TE-131	2293.78	1146.58	10.	3.	0.002	461.88	0.646s
CO-60	2348.13	1173.74	45.	14.	0.007	165.99	1.063s
TA-182	2374.32	1186.82	28.	27.	0.013	120.43	0.810s
TA-182	2444.65	1221.97	24.	8.	0.004	300.00	1.876
EU-154	2551.83	1275.53	7.	2.	0.001	530.33	0.678s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
FE-59	2585.00	1292.10	4.	0.	0.000	0.00	0.000s
CO-60	2664.56	1331.85	16.	6.	0.003	162.02	1.036s
AG-110M	2767.83	1383.46	7.	16.	0.008	117.59	1.524
EU-152	2815.21	1407.13	2.	11.	0.005	120.79	1.198s
K-40	2921.76	1460.37	6.	756.	0.378	11.10	2.097
BI-212	3241.33	1620.05	0.	9.	0.004	100.00	1.249s
BI-214	3529.46	1764.01	0.	35.	0.018	50.71	0.773s
MN-56	3625.00	1811.75	0.	1.	0.001	300.00	0.500s
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		3.2434E-02	1460.75	3.243E-02	(	6.197E-04	G
CR-51		0.0000E+00	320.07	0.000E+00	&	5.387E-04	G
MN-54		0.0000E+00	834.81	0.000E+00	%	4.470E-05	G
MN-56		0.0000E+00	846.60	0.000E+00	&	7.254E-05	G
			1811.20	0.000E+00	%	1.512E-04	G
FE-59		0.0000E+00	1099.22	0.000E+00	%	8.955E-05	G
			1291.56	0.000E+00	?	1.148E-04	G
CO-57		1.5654E-04	122.07	0.000E+00	} P	6.406E-05	G
			136.43	1.565E-04	(	3.888E-04	G
CO-58		0.0000E+00	810.75	0.000E+00	&	5.068E-05	G
CO-60		0.0000E+00	1332.51	0.000E+00	% P	9.161E-05	G
			1173.23	5.351E-05	? P	1.288E-04	G
Cm-243		4.2452E-04	277.60	4.245E-04	(	3.287E-04	G
			117.00	7.935E-04	}	4.940E-04	G
			103.76	0.000E+00	%	2.358E-04	G
			99.55	2.047E-04	-	3.726E-04	G
ZN-65		0.0000E+00	1115.52	0.000E+00	%	2.115E-04	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Kr-85	0.0000E+00	513.99	0.000E+00	%		1.564E+00	G
Y-88	0.0000E+00	1836.01	0.000E+00	%	P	4.191E-05	G
		898.02	0.000E+00	?	P	4.744E-05	G
NB-94	5.7659E-05	871.10	6.961E-05	&(		6.904E-05	G
		702.50	4.570E-05	?(		6.792E-05	G
Ag-108M	0.0000E+00	722.95	0.000E+00	}		8.715E-05	G
		614.37	0.000E+00	&		6.430E-05	G
		433.93	2.591E-05	&		4.818E-05	G
AG-110M	0.0000E+00	657.75	0.000E+00	%		7.746E-05	G
		884.67	3.793E-05	&		9.284E-05	G
		937.48	1.090E-04	&		2.042E-04	G
		1384.27	2.878E-04			2.705E-04	G
CD-109	6.6258E-04	88.04	6.626E-04	(		1.955E-03	G
SN-113	5.8427E-05	391.71	5.843E-05	(P		6.283E-05	G
		255.04	0.000E+00	%		2.382E-03	G
SB-125	3.0965E-04	427.95	6.579E-05	(		1.870E-04	G
		600.77	0.000E+00	%		3.044E-04	G
		636.15	0.000E+00	}		5.399E-04	G
		463.51	7.641E-04	@(		5.768E-04	G
		176.29	7.340E-04	&(		6.710E-04	G
TE-131	0.0000E+00	149.72	0.000E+00	!		7.200E-05	G
		452.32	0.000E+00	%		2.729E-04	G
		1146.96	0.000E+00	%		1.307E-03	G
		492.66	5.746E-04	?		9.543E-04	G
TE-132	5.7700E-05	228.16	5.770E-05	&(		4.642E-05	G
		116.30	0.000E+00	}		2.175E-03	G
		111.76	2.709E-03	&		2.266E-03	G
J-131	0.0000E+00	364.48	0.000E+00	%		5.118E-05	G
		636.97	0.000E+00	}		8.274E-04	G
		284.29	3.502E-04	?		5.488E-04	G
CS-134	2.1132E-05	604.66	2.113E-05	(		6.502E-05	G
		795.76	0.000E+00	!		1.125E-04	G
		569.29	0.000E+00	}		3.331E-04	G
		801.84	0.000E+00	%		8.358E-04	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-137	3.4748E-05	661.62	3.475E-05	(	8.664E-05		G
CE-139	4.2188E-05	165.85	4.219E-05	(P	5.890E-05		G
CE-141	4.4213E-05	145.45	4.421E-05	(	1.050E-04		G
CE-144	4.5063E-04	133.53	2.384E-04	(	4.085E-04		G
		80.12	1.883E-03	(	3.786E-03		G
EU-152	0.0000E+00	121.78	0.000E+00	}	1.819E-04		G
		344.30	0.000E+00	%	1.304E-04		G
		1408.08	2.236E-04	&	2.060E-04		G
		964.00	4.260E-04		5.854E-04		G
		1112.07	2.196E-04		6.412E-04		G
		778.90	1.763E-04	&	4.383E-04		G
EU-154	1.2473E-04	123.10	5.210E-05	(	1.173E-04		G
		1274.80	0.000E+00	%	1.726E-04		G
		723.30	0.000E+00	}	4.431E-04		G
		1004.80	2.917E-04	&(	5.509E-04		G
EU-155	1.3691E-04	86.45	0.000E+00	}	2.020E-04		G
		105.31	1.369E-04	$(	2.494E-04		G
TA-182	0.0000E+00	67.75	0.000E+00	%	2.217E-04		G
		1121.28	0.000E+00	%	5.201E-04		G
		1221.42	0.000E+00	%	3.659E-04		G
		1189.05	6.256E-04	&	6.398E-04		G
HG-203	0.0000E+00	279.17	0.000E+00	% P	6.419E-05		G
		72.87	5.216E-04		1.304E-03		G
TL-208	5.7074E-04	583.14	5.822E-04	@(	8.486E-05		G
		510.72	5.270E-04	(	3.308E-04		G
PB-212	1.6005E-03	238.63	1.601E-03	(	1.116E-04		G
		77.11	0.000E+00	}	5.082E-04		Energy duplication
		74.81	2.621E-03	}	7.818E-04		G
PB-214	1.2174E-03	351.99	1.195E-03	(	1.760E-04		G
		295.22	1.260E-03	*(	2.511E-04		G
		77.11	3.124E-03	}	7.122E-04		Energy duplication
		241.92	1.217E-03	}	7.782E-04		G
BI-207	5.7259E-05	569.67	0.000E+00	}	5.522E-05		G
		1063.62	5.726E-05	?(	1.140E-04		G
		74.97	0.000E+00	}	2.225E-04		G

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
BI-212	1.2142E-03	727.17	1.138E-03	(	6.049E-04	G
		1620.56	1.649E-03	?(	1.350E-03	G
		785.42	1.065E-03	?(	2.842E-03	G
BI-214	1.2896E-03	609.32	1.321E-03	(	1.195E-04	G
		1764.51	1.197E-03	(	2.521E-04	G
		1120.28	1.708E-03	+	6.983E-04	G
RA-224	1.7546E-03	241.00	1.755E-03	}(	2.242E-03	G
RA-226	0.0000E+00	185.99	0.000E+00	}	1.494E-03	G
AC-228	1.5628E-03	911.07	1.406E-03	(	3.248E-04	G
		968.90	1.764E-03	(	4.605E-04	G
		338.40	1.649E-03	(	4.811E-04	G
TH-227	1.8521E-04	236.00	1.852E-04	(	4.603E-04	G
		256.25	0.000E+00	%	7.576E-04	G
TH-234	1.3246E-03	63.29	1.325E-03	(	2.546E-03	G
		92.80	3.213E-03	}	1.931E-03	G
		92.38	0.000E+00	}	2.699E-03	G
U-235	4.1009E-04	185.72	4.101E-04	}	1.158E-04	G
		143.76	2.485E-04	$(	4.491E-04	G
		205.31	0.000E+00	%	8.543E-04	G
		163.35	7.711E-04	$(	9.960E-04	G
NP-237	5.8959E-04	86.49	2.578E-04	}	4.727E-04	G
		95.87	5.896E-04	(	1.825E-03	G
AM-241	1.9719E-04	59.54	1.972E-04	(P	2.951E-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		1.8868E+01	1.8868E+01	2.0948E+00	2.3505E+00
CR-51	<	3.1338E-01	6.6470E-01		
MN-54	<	2.6002E-02	2.7796E-02		
MN-56	<	4.22E-02	>12 Halflives		
FE-59	<	5.2093E-02	8.2668E-02		
CO-57	A	9.1062E-02	9.8364E-02	2.2080E-01	2.2086E-01
CO-58	<	2.9483E-02	3.9570E-02		
CO-60	<	5.3295E-02	5.3875E-02		
Cm-243		2.4696E-01	2.4740E-01	1.9012E-01	1.9064E-01
ZN-65	<	1.2305E-01	1.3403E-01		
Kr-85	<	9.0969E+02	9.0990E+02		
Y-88	<	2.4383E-02	2.9644E-02		
NB-94	#A	3.3542E-02	3.3542E-02	3.2482E-02	3.2537E-02
Ag-108M	<	3.7406E-02	3.7423E-02		
AG-110M	<	4.5059E-02	4.8976E-02		
CD-109	A	3.8544E-01	4.0357E-01	1.0758E+00	1.0760E+00
SN-113	#A	3.3989E-02	4.0731E-02	5.8402E-02	5.8447E-02
SB-125	C	1.8013E-01	1.8388E-01	1.6744E-01	1.6776E-01
TE-131	<	4.19E-02	>12 Halflives		
TE-132		3.3566E-02	2.0536E+01	2.1590E+01	2.1621E+01
J-131	<	2.9772E-02	3.9705E-01		
CS-134	A	1.2293E-02	1.2638E-02	3.4429E-02	3.4436E-02
CS-137	A	2.0214E-02	2.0253E-02	4.5372E-02	4.5387E-02
CE-139	A	2.4542E-02	2.8556E-02	3.6935E-02	3.6970E-02
CE-141	A	2.5720E-02	4.8936E-02	1.0532E-01	1.0535E-01
CE-144		2.6215E-01	2.8208E-01	3.4036E-01	3.4072E-01
EU-152	<	7.5835E-02	7.6176E-02		
EU-154	C	7.2558E-02	7.3047E-02	1.0968E-01	1.0976E-01
EU-155	A	7.9645E-02	8.0566E-02	1.3414E-01	1.3422E-01
TA-182	<	1.2895E-01	1.5455E-01		

HG-203	<	3.7339E-02	5.8386E-02

TL-208		3.3202E-01	>12 Halflives	8.2302E-02	8.4413E-02
PB-212		9.3108E-01	>12 Halflives	1.1390E-01	1.2546E-01
PB-214		7.0822E-01	>12 Halflives	1.2559E-01	1.3181E-01
BI-207	#A	3.3309E-02	3.3359E-02	6.8373E-02	6.8399E-02
BI-212		7.0636E-01	>12 Halflives	4.2291E-01	4.2479E-01
BI-214		7.5021E-01	>12 Halflives	1.4350E-01	1.4963E-01
RA-224	#	1.0207E+00	3.0220E+02	2.7814E+05	2.2244E+02
AC-228		9.0913E-01	>12 Halflives	1.9215E-01	1.9890E-01
TH-227	A	1.0774E-01	3.3214E-01	7.4566E-01	7.4589E-01
TH-234	A	7.7057E-01	1.8287E+00	3.2057E+00	3.2073E+00
U-235	A	2.3856E-01	2.3856E-01	2.4383E-01	2.4419E-01
NP-237	A	3.4298E-01	3.4298E-01	9.5544E-01	9.5563E-01
AM-241	A	1.1471E-01	1.1473E-01	1.5850E-01	1.5863E-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) 2.2998486E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 3.4604736E+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_13JUL2006_1549.An1

Sample description
FSS-OOL-14-01-007-F

Spectrum Filename: C:\GammaVision\Spectra\101F_13JUL2006_1549.An1

Acquisition information
Start time: 13-Jul-2006 15:49:30
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: 1.4980E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4980E+03) =
6.6756E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

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

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

Corrections	Status	Comments
Decay correct to date:	YES	12-Jul-2006 14:50:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2877

***** 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
74.86	120.	32.22	1.50	1.654E-02	74.81	9.600	PBC<MDA	PB212
77.10	209.	18.25	1.50	1.720E-02	77.11	10.700	1.025E+00	PB214
					77.11	17.500	6.266E-01	PB212
77.10	213.	18.25	1.50	1.720E-02	77.11	10.700	1.025E+00	PB214
					77.11	17.500	6.377E-01	PB212
93.15	111.	30.92	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
93.17	105.	31.98	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
129.09	90.	30.84	0.96	2.110E-02				
186.75	87.	32.91	1.06	1.854E-02	185.99	3.280	1.282E+00	RA226
208.78	66.	39.15	0.74	1.722E-02				
238.90	540.	5.08	1.12	1.556E-02	238.63	43.100	7.179E-01	PB212
238.89	327.	8.93	1.50	1.540E-02	238.63	43.100	PBC<MDA	PB212
241.19	71.	40.45	1.12	1.544E-02	241.00	3.900	PBC<MDA	RA224
295.46	120.	16.19	1.10	1.291E-02	295.22	19.200	4.306E-01	PB214
338.64	123.	14.91	1.29	1.134E-02	338.40	12.010	8.022E-01	AC228
352.21	174.	10.27	1.15	1.092E-02	351.99	37.100	3.829E-01	PB214
510.94	93.	21.34	1.10	7.587E-03	510.72	22.500	4.055E-01	TL208
583.51	175.	11.46	1.27	6.680E-03	583.14	86.000	2.709E-01	TL208
609.70	146.	13.35	1.19	6.409E-03	609.32	46.090	4.438E-01	BI214
661.74	67.	20.70	1.52	5.936E-03	661.62	84.620	1.193E-01	CS137
727.50	30.	35.46	1.50	5.443E-03	727.17	11.800	PBC<MDA	BI212
911.76	123.	10.05	1.50	4.444E-03	911.07	29.000	8.474E-01	AC228
969.00	78.	22.36	1.49	4.212E-03	968.90	17.460	9.480E-01	AC228
1120.68	47.	23.43	1.58	3.710E-03	1120.28	15.040	7.503E-01	BI214
1461.31	451.	4.88	1.76	2.941E-03	1460.75	10.700	1.285E+01	K40

1765.58	19.	24.45	1.04	2.481E-03	1764.51	15.920	4.376E-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	
418.10	209.21	167.	54.	0.027	109.43	0.722	AC-228	s
477.51	238.84	107.	540.	0.270	15.24	1.122	PB-212	D
482.09	241.13	372.	71.	0.035	121.34	1.123	RA-224	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	149.29	74.86	755.	120.	0.060	96.67	1.499
PB-214	153.79	77.11	652.	209.	0.105	54.74	1.499D
PB-212	153.79	77.11	648.	213.	0.106	54.74	1.499D
TH-234	185.92	93.17	635.	105.	0.052	95.95	1.499s
TH-234	185.88	93.15	605.	111.	0.056	92.77	1.499s
RA-226	372.29	186.32	384.	76.	0.038	114.92	1.499
PB-212	477.54	238.92	297.	420.	0.210	22.36	1.499
PB-214	477.48	238.89	266.	327.	0.164	26.78	1.499s
PB-214	590.54	295.40	126.	117.	0.058	48.51	1.499
AC-228	677.06	338.64	92.	121.	0.061	44.72	1.286
PB-214	704.27	352.23	89.	177.	0.089	31.41	1.499
TL-208	1021.82	510.94	99.	77.	0.038	64.03	1.096s
TL-208	1167.02	583.51	67.	173.	0.086	34.39	1.269
BI-214	1219.44	609.70	69.	145.	0.073	40.06	1.187
CS-137	1323.56	661.74	45.	66.	0.033	62.09	1.517
BI-212	1455.16	727.50	43.	30.	0.015	106.38	1.499s
AC-228	1823.86	911.76	15.	121.	0.061	30.16	1.499
AC-228	1938.40	969.00	59.	77.	0.039	67.08	1.487s
BI-214	2241.96	1120.68	28.	46.	0.023	70.29	1.583
K-40	2923.64	1461.31	9.	449.	0.224	14.64	1.757
BI-214	3532.60	1765.58	2.	19.	0.010	73.34	1.041s

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		-1.3554E-03					
			477.56	-1.355E-03	%(	3.238E-01 8.93E-02	G
K-40		1.2851E+01					
			1460.75	1.285E+01	(P	4.888E-01 6.31E-01	G
MN-54		-7.8629E-04					
			834.81	-7.863E-04	&(P	5.655E-02 1.55E-02	G
CO-57		1.5452E-03					
			122.07	1.545E-03	%(	4.937E-02 1.46E-02	G K
			136.43	7.681E-02	%	4.018E-01 1.20E-01	G
CO-60		5.7518E-04					
			1332.51	5.752E-04	%(P	6.728E-02 1.81E-02	G K
			1173.23	2.115E-02	% P	7.418E-02 2.17E-02	G K
Sr-85		-9.1109E-03					
			514.00	-9.111E-03	&(	5.301E-02 1.54E-02	G
Kr-85		-2.3972E+02					
			513.99	-2.397E+02	&(P	1.219E+03 3.53E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	2.817E-02 3.82E-03	G K
			898.02	-6.551E-03	% P	5.904E-02 1.65E-02	G
NB-94		-3.7356E-03					
			871.10	-3.736E-03	%(P	4.387E-02 1.20E-02	G K
			702.50	-7.137E-05	% P	5.393E-02 1.50E-02	G K
Ag-108M		-4.0986E-05					
			722.95	-4.099E-05	&(	6.530E-02 1.83E-02	G K
			614.37	-1.158E-02	% P	6.989E-02 2.04E-02	G
			433.93	7.930E-03	%	4.536E-02 1.32E-02	G
CD-109		-3.2049E-02					
			88.04	-3.205E-02	&(P	1.615E+00 4.80E-01	G
SN-113		-2.3815E-03					
			391.71	-2.381E-03	&(	6.095E-02 1.74E-02	G K
			255.04	-2.791E-01	& P	2.046E+00 6.03E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-5.4756E-02						
		427.95	-5.476E-02	%(P	1.533E-01	4.57E-02	G K
		600.77	1.282E-03	% P	2.075E-01	5.67E-02	G
		636.15	7.080E-03	& P	3.835E-01	1.06E-01	G
		463.51	-2.718E-02	% P	5.001E-01	1.42E-01	G
		176.29	-1.427E-01	% P	6.606E-01	1.96E-01	G
I-131	1.1176E-02						
		364.48	1.118E-02	&(	5.043E-02	1.48E-02	G K
		636.97	0.000E+00	&	8.853E-01	2.51E-01	G
		284.29	1.757E-01	%	6.195E-01	1.84E-01	G
CS-134	-2.7341E-03						
		604.66	-2.734E-03	%(P	5.186E-02	1.46E-02	G K
		795.76	3.795E-02	% P	5.195E-02	1.66E-02	G
		569.29	8.427E-02	% P	2.959E-01	8.68E-02	G
		801.84	1.432E-01	%	5.938E-01	1.72E-01	G
CS-137	1.1926E-01						
		661.62	1.193E-01	(P	6.074E-02	2.50E-02	G
CE-139	4.9714E-03						
		165.85	4.971E-03	&(P	5.007E-02	1.48E-02	G
EU-152	8.0091E-04						
		121.78	8.009E-04	%(P	1.393E-01	4.11E-02	G K
		344.30	3.331E-02	% P	1.555E-01	4.58E-02	G
		1408.08	-3.794E-03	% P	2.929E-01	7.70E-02	G
		964.00	-8.410E-02	& P	6.022E-01	1.73E-01	G
		1112.07	-3.363E-03	% P	5.249E-01	1.45E-01	G
		778.90	7.139E-02	% P	3.435E-01	9.81E-02	G
EU-154	-5.6388E-03						
		123.10	-5.639E-03	&(P	1.100E-01	3.26E-02	G K
		1274.80	-1.756E-02	% P	1.852E-01	5.12E-02	G
		723.30	-1.778E-03	& P	2.014E-01	5.38E-02	G
		1004.80	8.057E-02	% P	3.226E-01	9.31E-02	G
EU-155	3.0732E-03						
							Energy duplication
		86.45	3.073E-03	%(	1.976E-01	5.88E-02	G K
		105.31	7.005E-02	%	2.165E-01	6.51E-02	G
HG-203	-1.9642E-04						
		279.17	-1.964E-04	%(	4.109E-02	1.18E-02	G K
		72.87	8.335E-02	& P	8.939E-01	2.65E-01	G
		70.83	-1.191E+00	%	2.193E+00	6.67E-01	G
		82.50	-3.023E-01	&	2.751E+00	8.21E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.7089E-01						
		583.14	2.709E-01	(P	6.428E-02	3.15E-02	G
		510.72	4.055E-01	+ P	2.595E-01	1.05E-01	G
PB-212	5.9857E-01						
		238.63	5.644E-01	(P	1.116E-01	4.27E-02	G K
							Energy duplication
		77.11	6.377E-01	(	3.635E-01	1.16E-01	G
		74.81	6.806E-01	?(P	7.427E-01	2.29E-01	G
PB-214	4.0486E-01						
		351.99	3.947E-01	(P	1.036E-01	4.18E-02	G K
		295.22	4.246E-01	(P	2.002E-01	6.97E-02	G
							Energy duplication
		77.11	1.025E+00	+ P	5.962E-01	1.90E-01	G
		241.92	2.567E+00	+ P	6.167E-01	2.30E-01	G
BI-212	4.1674E-01						
		727.17	4.167E-01	*(P	4.693E-01	1.51E-01	G K
		1620.56	1.465E-02	%	1.960E+00	4.96E-01	G
		785.42	5.461E-01	% P	2.360E+00	6.78E-01	G
BI-214	4.4218E-01						
		609.32	4.438E-01	(P	1.261E-01	5.97E-02	G K
		1764.51	4.376E-01	(P	2.061E-01	1.09E-01	G
		1120.28	7.503E-01	+ P	4.394E-01	1.77E-01	G
RA-224	8.4971E-01						
		241.00	8.497E-01	%(P	1.331E+00	4.07E-01	G
RA-226	1.1224E+00						
		185.99	1.122E+00	(	1.392E+00	4.30E-01	G
AC-228	8.6816E-01						
		911.07	8.474E-01	(P	1.447E-01	8.66E-02	G K
		968.90	9.480E-01	@(P	4.712E-01	2.14E-01	G
		338.40	8.022E-01	(P	3.134E-01	1.22E-01	G
TH-227	-1.3967E-01						
		236.00	-1.397E-01	&(P	4.819E-01	1.44E-01	G K
		256.25	9.333E-02	% P	5.509E-01	1.62E-01	G
PA-234	-4.3855E-02						
		98.44	-4.385E-02	%(	2.008E-01	6.01E-02	G K
		946.00	2.387E-02	&	2.557E-01	7.08E-02	G
		131.28	-5.430E-02	&	2.295E-01	6.87E-02	G
		94.67	-6.320E-02	%	3.407E-01	1.02E-01	G
		883.24	-9.104E-04	%	4.355E-01	1.19E-01	G
		926.70	0.000E+00	%	6.568E-01	1.84E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.293E-01 %   4.296E-01 1.27E-01 G

TH-234       1.4474E+00
                           63.29 1.004E+00 %(P 2.120E+00 6.40E-01 G K
                           92.80 1.679E+00 *(P 1.774E+00 5.48E-01 G
                           92.38 1.850E+00 &(P 2.125E+00 6.53E-01 G

AM-241      -6.2284E-02
                           59.54-6.228E-02 %(P 3.073E-01 9.17E-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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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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	-1.3372E-03	-1.3554E-03	2.6803E-01	2.6803E-01	3.195E-01
K-40		1.2851E+01	1.2851E+01	1.8909E+00	2.0255E+00	
MN-54	#A	-7.8447E-04	-7.8629E-04	3.8903E-02	3.8903E-02	5.642E-02
CO-57	#B	1.5411E-03	1.5452E-03	4.3799E-02	4.3799E-02	4.924E-02
CO-60	#B	5.7496E-04	5.7518E-04	5.4352E-02	5.4352E-02	6.726E-02

Sr-85	#A	-9.0101E-03	-9.1109E-03	4.6345E-02	4.6348E-02	5.242E-02
Kr-85	#A	-2.3972E+02	-2.3972E+02	1.3922E+03	1.3922E+03	1.219E+03
Y-88	#B	0.0000E+00	0.0000E+00	1.1467E-02	1.1469E-02	2.798E-02
NB-94	#B	-3.7356E-03	-3.7356E-03	4.1228E-02	4.1228E-02	4.387E-02
Ag-108M	#B	-4.0985E-05	-4.0986E-05	5.4966E-02	5.4966E-02	6.530E-02
CD-109	#A	-3.1998E-02	-3.2049E-02	2.0755E+00	2.0755E+00	1.613E+00
SN-113	#B	-2.3666E-03	-2.3815E-03	5.2237E-02	5.2237E-02	6.057E-02
SB-125	#B	-5.4717E-02	-5.4756E-02	1.4265E-01	1.4269E-01	1.531E-01
I-131	#B	1.0216E-02	1.1176E-02	4.4394E-02	4.4399E-02	4.610E-02
CS-134	#B	-2.7315E-03	-2.7341E-03	8.5566E-02	8.5567E-02	5.181E-02
CS-137		1.1925E-01	1.1926E-01	7.5036E-02	7.5337E-02	
CE-139	#A	4.9453E-03	4.9714E-03	4.4446E-02	4.4447E-02	4.981E-02
EU-152	#B	8.0079E-04	8.0091E-04	1.2323E-01	1.2323E-01	1.393E-01
EU-154	#B	-5.6375E-03	-5.6388E-03	1.3786E-01	1.3786E-01	1.100E-01
EU-155	#B	3.0719E-03	3.0732E-03	1.7646E-01	1.7646E-01	1.975E-01
HG-203	#B	-1.9340E-04	-1.9642E-04	3.5388E-02	3.5388E-02	4.045E-02
TL-208		2.7089E-01	2.7089E-01	9.4449E-02	9.5681E-02	
PB-212	#	5.9857E-01	5.9857E-01	1.3578E-01	1.3993E-01	1.116E-01
PB-214	#	4.0486E-01	4.0486E-01	1.1863E-01	1.2082E-01	1.036E-01
BI-212	#A	4.1674E-01	4.1674E-01	4.5343E-01	4.5405E-01	4.693E-01
BI-214		4.4218E-01	4.4218E-01	1.7850E-01	1.8024E-01	
RA-224	#A	8.4971E-01	8.4971E-01	1.2219E+00	1.2229E+00	1.331E+00
RA-226	#A	1.1224E+00	1.1224E+00	1.2898E+00	1.2913E+00	1.392E+00
AC-228		8.6816E-01	8.6816E-01	2.5220E-01	2.5692E-01	
TH-227	#B	-1.3967E-01	-1.3967E-01	4.4733E-01	4.4740E-01	4.819E-01
PA-234	#B	-4.3855E-02	-4.3855E-02	1.8038E-01	1.8040E-01	2.008E-01
TH-234	#B	1.4474E+00	1.4474E+00	1.1558E+00	1.1586E+00	2.120E+00
AM-241	#A	-6.2283E-02	-6.2284E-02	2.9905E-01	2.9907E-01	3.073E-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) 1.4551679E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.4551686E+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_13JUL2006_1629.An1

Sample description
FSS-OOL-14-01-003-F

Spectrum Filename: C:\GammaVision\Spectra\101F_13JUL2006_1629.An1

Acquisition information
Start time: 13-Jul-2006 16:29:24
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: 1.2540E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.2540E+03) =
7.9745E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

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

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

Corrections	Status	Comments
Decay correct to date:	YES	12-Jul-2006 11:30:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 10 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.3255

***** 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
77.01	201.	16.38	1.50	1.720E-02	77.11	10.700	1.176E+00	PB214
					77.11	17.500	7.187E-01	PB212
77.01	205.	16.38	1.50	1.720E-02	77.11	10.700	1.176E+00	PB214
					77.11	17.500	7.321E-01	PB212
92.89	88.	30.20	1.32	1.990E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
128.71	62.	33.46	1.25	2.110E-02				
186.21	79.	28.06	1.31	1.857E-02	185.99	3.280	1.397E+00	RA226
209.40	39.	40.30	0.94	1.721E-02				
238.80	361.	6.25	1.12	1.557E-02	238.63	43.100	5.689E-01	PB212
241.72	50.	33.23	1.12	1.541E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	PBC<MDA	PB214
270.61	54.	26.48	1.27	1.399E-02				
295.68	88.	18.64	0.82	1.290E-02	295.22	19.200	3.754E-01	PB214
338.71	97.	16.45	1.13	1.134E-02	338.40	12.010	7.496E-01	AC228
352.13	146.	11.25	1.06	1.092E-02	351.99	37.100	3.835E-01	PB214
463.26	30.	37.63	1.50	8.342E-03	463.51	10.000	PBC<MDA	SB125
511.22	55.	19.82	1.53	7.583E-03	510.72	22.500	2.440E-01	TL208
583.38	121.	12.13	1.37	6.682E-03	583.14	86.000	2.218E-01	TL208
609.57	103.	12.81	1.80	6.410E-03	609.32	46.090	3.708E-01	BI214
661.99	45.	20.44	0.98	5.934E-03	661.62	84.620	9.463E-02	CS137
727.01	46.	32.68	1.52	5.444E-03	727.17	11.800	7.604E-01	BI212
911.92	68.	16.53	1.53	4.443E-03	911.07	29.000	5.535E-01	AC228
968.50	58.	21.83	1.75	4.214E-03				
968.50	58.	21.83	1.75	4.214E-03	968.90	17.460	8.379E-01	AC228
1461.39	335.	5.54	1.86	2.941E-03	1460.75	10.700	1.140E+01	K40
1765.32	14.	26.73	0.67	2.481E-03	1764.51	15.920	3.700E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.48	209.40	104.	39.	0.020	120.89	0.935	AC-228	
477.30	238.74	73.	361.	0.180	18.74	1.122	PB-212	D
483.13	241.66	111.	50.	0.025	99.70	1.124	PB-214	D
540.94	270.61	70.	54.	0.027	79.44	1.273	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-214	153.79	77.11	463.	201.	0.100	49.14	1.499D
PB-212	153.79	77.11	459.	205.	0.102	49.14	1.499D
TH-234	185.22	92.82	421.	78.	0.039	102.11	1.499s
TH-234	185.17	92.80	402.	83.	0.042	99.63	1.499s
RA-226	372.21	186.28	186.	62.	0.031	100.61	1.499s
PB-212	477.34	238.82	203.	296.	0.148	26.17	1.499
PB-214	590.95	295.60	112.	80.	0.040	63.68	1.499s
AC-228	677.19	338.71	51.	84.	0.042	47.27	1.499
PB-214	703.90	352.05	55.	146.	0.073	32.38	1.499
SB-125	926.42	463.26	57.	30.	0.015	112.89	1.499s
TL-208	1022.38	511.22	43.	39.	0.019	59.45	1.530s
TL-208	1166.76	583.38	35.	118.	0.059	36.39	1.368s
BI-214	1219.17	609.57	26.	102.	0.051	38.42	1.797s
CS-137	1324.07	661.99	19.	44.	0.022	61.32	0.978
BI-212	1454.17	727.01	46.	45.	0.023	98.04	1.520s
AC-228	1823.78	911.71	22.	53.	0.027	53.15	1.578s
AC-228	1939.13	969.36	29.	31.	0.016	88.70	1.616
K-40	2923.79	1461.39	5.	333.	0.167	16.61	1.861
BI-214	3532.07	1765.32	0.	14.	0.007	80.18	0.666s

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		1.2526E-03					
			477.56	1.253E-03	%(	4.332E-01 1.21E-01	G
K-40		1.1402E+01					
			1460.75	1.140E+01	(P	4.451E-01 6.36E-01	G
MN-54		-5.3301E-03					
			834.81	-5.330E-03	%(P	5.345E-02 1.46E-02	G
CO-57		4.6964E-04					
			122.07	4.696E-04	&(	5.211E-02 1.53E-02	G K
			136.43	-1.489E-01	%	4.232E-01 1.27E-01	G
CO-60		-3.3481E-03					
			1332.51	-3.348E-03	%(P	6.414E-02 1.69E-02	G K
			1173.23	1.940E-02	% P	8.493E-02 2.45E-02	G K
Sr-85		-1.6527E-02					
			514.00	-1.653E-02	%(	6.117E-02 1.80E-02	G
Kr-85		-4.1574E+02					
			513.99	-4.157E+02	%(P	1.405E+03 4.11E+02	G
Y-88		3.8658E-03					
			1836.01	3.866E-03	%(	4.969E-02 1.21E-02	G K
			898.02	-4.561E-04	% P	7.479E-02 2.05E-02	G
NB-94		-4.5323E-03					
			871.10	-4.532E-03	%(P	5.611E-02 1.54E-02	G K
			702.50	-1.929E-03	% P	4.975E-02 1.36E-02	G K
Ag-108M		-1.6315E-02					
			722.95	-1.631E-02	&(	7.347E-02 2.14E-02	G K
			614.37	-7.063E-03	% P	5.579E-02 1.58E-02	G
			433.93	2.659E-06	%	5.159E-02 1.45E-02	G
CD-109		-1.0911E-01					
			88.04	-1.091E-01	%(P	1.643E+00 4.88E-01	G
SN-113		-6.6729E-03					
			391.71	-6.673E-03	%(	7.002E-02 2.01E-02	G K
			255.04	6.177E-01	& P	1.869E+00 5.58E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.0982E-01						
		427.95	1.459E-02	&(P	1.479E-01	4.22E-02	G K
		600.77	3.205E-02	% P	2.488E-01	7.01E-02	G
		636.15	-4.159E-02	% P	4.090E-01	1.13E-01	G
		463.51	3.917E-01	(P	4.896E-01	1.54E-01	G
		176.29	-4.049E-02	% P	6.385E-01	1.86E-01	G
I-131	2.7020E-03						
		364.48	2.702E-03	%(	5.602E-02	1.60E-02	G K
		636.97	5.196E-02	%	6.822E-01	1.89E-01	G
		284.29	7.134E-02	%	4.863E-01	1.39E-01	G
CS-134	-1.0211E-02						
		604.66	-1.021E-02	%(P	5.203E-02	1.48E-02	G K
		795.76	1.473E-02	% P	6.603E-02	1.89E-02	G
		569.29	9.776E-02	% P	3.036E-01	8.92E-02	G
		801.84	1.459E-01	%	5.477E-01	1.58E-01	G
CS-137	9.4629E-02						
		661.62	9.463E-02	(P	4.925E-02	1.97E-02	G
CE-139	1.0703E-02						
		165.85	1.070E-02	%(P	4.777E-02	1.42E-02	G
EU-152	-6.3455E-03						
		121.78	-6.346E-03	&(P	1.531E-01	4.51E-02	G K
		344.30	-6.036E-02	& P	1.764E-01	5.24E-02	G
		1408.08	-6.705E-02	% P	3.315E-01	9.23E-02	G
		964.00	2.220E-01	% P	4.599E-01	1.39E-01	G
		1112.07	-8.307E-02	% P	6.533E-01	1.85E-01	G
		778.90	2.369E-02	& P	4.319E-01	1.19E-01	G
EU-154	-2.2782E-03						
		123.10	-2.278E-03	%(P	1.060E-01	3.11E-02	G K
		1274.80	-1.266E-02	% P	2.043E-01	5.55E-02	G
		723.30	-5.792E-02	& P	3.623E-01	1.04E-01	G
		1004.80	5.795E-02	% P	3.406E-01	9.56E-02	G
EU-155	1.2048E-01						
		86.45	1.205E-01	%(	1.791E-01	5.49E-02	G K
		105.31	7.965E-02	%	1.936E-01	5.84E-02	G
HG-203	-1.0838E-04						
		279.17	-1.084E-04	%(	5.167E-02	1.49E-02	G K
		72.87	-3.005E-01	% P	1.306E+00	3.90E-01	G
		70.83	-6.319E-01	&	2.332E+00	7.00E-01	G
		82.50	-8.489E-02	%	3.102E+00	9.21E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.2642E-01						
		583.14	2.218E-01	*(P	5.652E-02	2.75E-02	G
		510.72	2.440E-01	*(P	2.106E-01	6.85E-02	G
PB-212	4.7590E-01						
		238.63	4.759E-01	(P	1.110E-01	4.24E-02	G K
							Energy duplication
		77.11	7.321E-01	+	3.670E-01	1.20E-01	G
		74.81	4.190E-01	& P	7.633E-01	2.32E-01	G
PB-214	3.7362E-01						
		351.99	3.870E-01	(P	9.907E-02	4.23E-02	G K
		295.22	3.477E-01	(P	2.257E-01	7.55E-02	G
							Energy duplication
		77.11	1.176E+00	+ P	6.026E-01	1.96E-01	G
		241.92	-3.213E-02	% P	7.936E-01	2.33E-01	G
BI-212	7.6044E-01						
		727.17	7.604E-01	@(P	5.739E-01	2.52E-01	G K
		1620.56	2.057E-01	&	2.256E+00	5.91E-01	G
		785.42	-2.049E-02	% P	2.694E+00	7.27E-01	G
BI-214	3.7057E-01						
		609.32	3.708E-01	(P	9.703E-02	4.80E-02	G K
		1764.51	3.700E-01	(P	2.011E-01	1.02E-01	G
		1120.28	2.847E-01	& P	5.514E-01	1.68E-01	G
RA-224	2.9596E-01						
		241.00	2.960E-01	&(P	1.354E+00	4.03E-01	G
RA-226	1.0976E+00						
		185.99	1.098E+00	(	1.171E+00	3.68E-01	G
AC-228	4.9290E-01						
		911.07	4.462E-01	*(P	2.059E-01	8.18E-02	G K
		968.90	4.554E-01	(P	4.075E-01	1.38E-01	G
		338.40	6.603E-01	(P	2.833E-01	1.07E-01	G
TH-227	-5.6213E-02						
		236.00	-5.621E-02	&(P	4.586E-01	1.35E-01	G K
		256.25	-6.712E-02	% P	5.753E-01	1.67E-01	G
PA-234	-4.5367E-02						
		98.44	-4.537E-02	%(	1.785E-01	5.33E-02	G K
		946.00	-3.580E-03	&	2.867E-01	7.70E-02	G
		131.28	-7.065E-02	%	2.213E-01	6.64E-02	G
		94.67	-7.458E-02	%	2.738E-01	8.18E-02	G
		883.24	-1.971E-02	&	4.424E-01	1.20E-01	G
		926.70	6.552E-02	%	4.958E-01	1.37E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.525E-01 %   4.456E-01 1.32E-01 G

TH-234       1.2235E+00
                           63.29 7.330E-01 &(P 2.253E+00 6.73E-01 G K
                           92.80 1.503E+00 *(P 1.737E+00 5.36E-01 G
                           92.38 1.642E+00 *(P 2.077E+00 6.37E-01 G

AM-241      -6.8614E-02
                           59.54-6.861E-02 %(P 2.899E-01 8.63E-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	1.2331E-03	1.2526E-03	3.6226E-01	3.6226E-01	4.265E-01
K-40		1.1402E+01	1.1402E+01	1.9066E+00	2.0125E+00	
MN-54	#A	-5.3158E-03	-5.3301E-03	6.2406E-02	6.2407E-02	5.331E-02
CO-57	#B	4.6819E-04	4.6964E-04	4.6000E-02	4.6000E-02	5.195E-02
CO-60	#B	-3.3466E-03	-3.3481E-03	6.0541E-02	6.0541E-02	6.411E-02

Sr-85	#A	-1.6315E-02	-1.6527E-02	5.4135E-02	5.4143E-02	6.038E-02
Kr-85	#A	-4.1573E+02	-4.1574E+02	1.4897E+03	1.4899E+03	1.405E+03
Y-88	#B	3.8355E-03	3.8658E-03	3.6227E-02	3.6227E-02	4.930E-02
NB-94	#B	-4.5323E-03	-4.5323E-03	5.2955E-02	5.2956E-02	5.611E-02
Ag-108M	#B	-1.6314E-02	-1.6315E-02	6.4067E-02	6.4074E-02	7.347E-02
CD-109	#A	-1.0891E-01	-1.0911E-01	1.6619E+00	1.6619E+00	1.640E+00
SN-113	#B	-6.6245E-03	-6.6729E-03	6.0372E-02	6.0373E-02	6.952E-02
SB-125	#B	1.0973E-01	1.0982E-01	1.2989E-01	1.3004E-01	1.477E-01
I-131	#B	2.4347E-03	2.7020E-03	4.7923E-02	4.7923E-02	5.048E-02
CS-134	#B	-1.0200E-02	-1.0211E-02	5.4650E-02	5.4653E-02	5.197E-02
CS-137		9.4622E-02	9.4629E-02	5.9188E-02	5.9429E-02	
CE-139	#A	1.0638E-02	1.0703E-02	4.2562E-02	4.2566E-02	4.748E-02
EU-152	#B	-6.3444E-03	-6.3455E-03	2.0945E-01	2.0945E-01	1.531E-01
EU-154	#B	-2.2776E-03	-2.2782E-03	2.8352E-01	2.8352E-01	1.060E-01
EU-155	#B	1.2042E-01	1.2048E-01	1.6456E-01	1.6469E-01	1.790E-01
HG-203	#B	-1.0645E-04	-1.0838E-04	4.4615E-02	4.4615E-02	5.075E-02
TL-208	#	2.2642E-01	2.2642E-01	8.4050E-02	8.5018E-02	
PB-212	#	4.7590E-01	4.7590E-01	1.2714E-01	1.2995E-01	1.110E-01
PB-214	#	3.7362E-01	3.7362E-01	1.2261E-01	1.2441E-01	9.907E-02
BI-212	#	7.6044E-01	7.6044E-01	7.5671E-01	7.5793E-01	
BI-214		3.7057E-01	3.7057E-01	1.4394E-01	1.4545E-01	
RA-224	#A	2.9596E-01	2.9596E-01	1.2077E+00	1.2078E+00	1.354E+00
RA-226	#A	1.0976E+00	1.0976E+00	1.1044E+00	1.1061E+00	1.171E+00
AC-228	#	4.9290E-01	4.9290E-01	1.9170E-01	1.9372E-01	2.059E-01
TH-227	#B	-5.6213E-02	-5.6213E-02	4.4615E-01	4.4616E-01	4.586E-01
PA-234	#B	-4.5367E-02	-4.5367E-02	1.6004E-01	1.6006E-01	1.785E-01
TH-234	#B	1.2235E+00	1.2235E+00	1.2956E+00	1.2974E+00	2.253E+00
AM-241	#A	-6.8614E-02	-6.8614E-02	2.8334E-01	2.8337E-01	2.899E-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) 1.2853944E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.2853951E+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_13JUL2006_1706.An1

Sample description
FSS-OOL-14-01-012-F

Spectrum Filename: C:\GammaVision\Spectra\101F_13JUL2006_1706.An1

Acquisition information
Start time: 13-Jul-2006 17:06:47
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: 1.3380E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.3380E+03) =
7.4738E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

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

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

Corrections	Status	Comments
Decay correct to date:	YES	12-Jul-2006 13:32:00
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: 0.2598

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.70	91.	35.61	1.50	1.654E-02	74.81	9.600	PBC<MDA	PB212
77.13	177.	18.61	1.50	1.720E-02	77.11	17.500	5.948E-01	PB212
					77.11	10.700	9.525E-01	PB214
77.13	174.	18.61	1.50	1.720E-02	77.11	17.500	5.824E-01	PB212
					77.11	10.700	9.525E-01	PB214
87.79	68.	32.52	1.01	1.933E-02	88.04	3.790	PBC<MDA	CD109
89.69	61.	34.03	1.02	1.957E-02				
93.11	110.	19.40	1.02	1.995E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.755E+00	TH234
185.76	122.	20.77	1.26	1.860E-02				
185.76	122.	20.77	1.26	1.860E-02	185.99	3.280	2.028E+00	RA226
209.36	70.	33.51	1.36	1.721E-02				
238.88	455.	5.29	1.12	1.556E-02	238.63	43.100	6.748E-01	PB212
					241.92	7.470	3.985E+00	PB214
242.05	85.	19.95	1.12	1.539E-02				
295.48	120.	17.48	1.02	1.291E-02	295.22	19.200	4.797E-01	PB214
327.85	35.	37.36	1.51	1.170E-02				
338.57	93.	20.89	1.20	1.134E-02	338.40	12.010	6.758E-01	AC228
352.24	175.	10.05	1.10	1.092E-02	351.99	37.100	4.311E-01	PB214
462.82	34.	32.68	0.58	8.354E-03				
462.82	34.	32.68	0.58	8.354E-03	463.51	10.000	PBC<MDA	SB125
511.29	92.	18.06	0.82	7.582E-03	510.72	22.500	4.481E-01	TL208
583.54	143.	10.23	1.55	6.680E-03	583.14	86.000	2.467E-01	TL208
609.47	123.	10.96	1.61	6.411E-03	609.32	46.090	4.152E-01	BI214
661.93	67.	25.76	1.66	5.935E-03	661.62	84.620	1.337E-01	CS137
720.78	14.	41.27	1.50	5.470E-03	723.30	19.700	PBC<MDA	EU154
727.52	31.	28.10	1.50	5.443E-03	727.17	11.800	4.891E-01	BI212

795.39	20.	40.91	1.50	5.016E-03	795.76	85.400	PBC<MDA	CS134
911.56	80.	14.04	0.81	4.444E-03	911.07	29.000	6.151E-01	AC228
968.49	71.	19.11	1.55	4.214E-03				
968.49	71.	19.11	1.55	4.214E-03	968.90	17.460	9.624E-01	AC228
1119.46	65.	19.81	1.84	3.713E-03	1120.28	15.040	1.173E+00	BI214
1461.38	421.	4.91	1.72	2.941E-03	1460.75	10.700	1.343E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1765.24	23.	20.85	1.50	2.481E-03	1764.51	15.920	5.768E-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	
175.16	88.07	214.	68.	0.034	97.55	1.014	PB-214	lD
178.96	89.97	184.	61.	0.030	102.08	1.016	PB-214	lD
418.40	209.36	182.	70.	0.035	100.52	1.360	AC-228	s
477.45	238.90	62.	455.	0.227	15.86	1.122	PB-212	D
483.80	242.07	102.	85.	0.043	59.86	1.124	PB-214	D
655.48	327.85	68.	35.	0.018	112.09	1.513	AC-228	s
925.53	462.82	38.	34.	0.017	98.04	0.583	CS-138	l
1937.39	968.49	69.	33.	0.017	118.09	1.552	SB-124	

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	148.97	74.70	548.	91.	0.046	106.84	1.499
PB-212	153.79	77.11	456.	177.	0.089	55.83	1.499D
PB-214	153.79	77.11	459.	174.	0.087	55.83	1.499D
TH-234	185.77	93.09	470.	111.	0.055	79.65	1.499s
TH-234	185.74	93.08	419.	145.	0.072	62.02	1.499s
RA-226	371.65	186.00	222.	98.	0.049	70.99	1.499s
PB-212	477.43	238.87	266.	339.	0.169	25.57	1.499
RA-224	483.17	241.73	269.	82.	0.041	89.89	1.499s
PB-214	590.82	295.54	93.	90.	0.045	54.25	1.499
AC-228	677.11	338.66	87.	89.	0.045	53.13	1.499
PB-214	704.16	352.18	63.	163.	0.081	30.86	1.499
TL-208	1022.52	511.29	73.	76.	0.038	54.18	0.819s
TL-208	1167.09	583.54	28.	140.	0.070	30.69	1.549
BI-214	1218.99	609.47	28.	121.	0.061	32.89	1.605
CS-137	1323.95	661.93	62.	67.	0.033	77.28	1.663
BI-212	1455.20	727.52	25.	31.	0.016	84.29	1.499s
AC-228	1823.61	911.63	24.	69.	0.035	45.57	1.578s
AC-228	1939.20	969.39	33.	37.	0.018	80.61	1.616
BI-214	2239.51	1119.46	25.	65.	0.032	59.44	1.836s
K-40	2923.78	1461.38	4.	419.	0.209	14.74	1.722

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3531.91	1765.24	0.	23.	0.011	62.55	1.499

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

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

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		-3.2870E-02					
			477.56	-3.287E-02	%(	4.243E-01 1.20E-01	G
K-40		1.3429E+01					
			1460.75	1.343E+01	(P	3.998E-01 6.63E-01	G
MN-54		1.0174E-02					
			834.81	1.017E-02	%(P	4.246E-02 1.20E-02	G
CO-57		4.4880E-03					
			122.07	4.488E-03	&(	4.956E-02 1.47E-02	G K
			136.43	-7.348E-02	%	4.211E-01 1.25E-01	G
CO-60		2.2994E-02					
			1332.51	2.299E-02	%(P	7.594E-02 2.21E-02	G K
			1173.23	1.064E-02	& P	8.245E-02 2.33E-02	G K
Sr-85		-1.1705E-02					
			514.00	-1.170E-02	%(	6.931E-02 2.03E-02	G
Kr-85		-3.0355E+02					
			513.99	-3.035E+02	%(P	1.589E+03 4.63E+02	G
Y-88		-4.1231E-03					
			1836.01	-4.123E-03	%(	4.839E-02 1.19E-02	G K
			898.02	8.087E-03	& P	5.990E-02 1.68E-02	G
NB-94		-2.3146E-03					
			871.10	-2.315E-03	%(P	4.275E-02 1.13E-02	G K
			702.50	8.547E-03	% P	5.124E-02 1.46E-02	G K
Ag-108M		2.1710E-03					
			722.95	2.171E-03	&(	1.050E-01 3.02E-02	G K
			614.37	-2.110E-02	% P	6.126E-02 1.82E-02	G
			433.93	2.421E-02	%	4.323E-02 1.33E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	-3.5887E-02						
		88.04	-3.589E-02	%(P	1.689E+00	5.01E-01	G
SN-113	3.2797E-04						
		391.71	3.280E-04	&(	6.515E-02	1.85E-02	G K
		255.04	-3.364E-01	% P	2.139E+00	6.30E-01	G
SB-125	2.5858E-03						
		427.95	2.586E-03	%(P	1.516E-01	4.29E-02	G K
		600.77	6.339E-02	% P	2.693E-01	7.82E-02	G
		636.15	8.420E-02	% P	4.681E-01	1.34E-01	G
		463.51	1.977E-01	% P	4.205E-01	1.27E-01	G
		176.29	-2.005E-02	% P	6.204E-01	1.81E-01	G
I-131	-1.4011E-03						
		364.48	-1.401E-03	%(	5.410E-02	1.54E-02	G K
		636.97	1.627E-01	%	7.212E-01	2.08E-01	G
		284.29	3.761E-02	%	6.447E-01	1.86E-01	G
CS-134	-2.6088E-02						
		604.66	-2.609E-02	&(P	6.677E-02	1.99E-02	G K
		795.76	4.663E-02	% P	6.071E-02	1.95E-02	G
		569.29	1.124E-02	% P	2.879E-01	7.99E-02	G
		801.84	8.003E-02	&	6.198E-01	1.74E-01	G
CS-137	1.3372E-01						
		661.62	1.337E-01	(P	7.950E-02	3.49E-02	G
CE-139	3.1302E-03						
		165.85	3.130E-03	%(P	5.124E-02	1.51E-02	G
EU-152	1.3835E-03						
		121.78	1.384E-03	&(P	1.445E-01	4.25E-02	G K
		344.30	-2.570E-03	& P	1.729E-01	4.95E-02	G
		1408.08	3.153E-02	& P	2.483E-01	6.60E-02	G
		964.00	-6.356E-03	% P	5.045E-01	1.39E-01	G
		1112.07	-1.186E-01	& P	6.273E-01	1.80E-01	G
		778.90	-1.487E-03	% P	4.670E-01	1.29E-01	G
EU-154	8.8947E-03						
		123.10	8.895E-03	&(P	1.074E-01	3.18E-02	G K
		1274.80	-6.445E-03	& P	2.016E-01	5.46E-02	G
		723.30	1.300E-01	& P	1.669E-01	5.50E-02	G
		1004.80	-1.160E-02	% P	3.723E-01	1.02E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	6.6299E-03						
		86.45	6.630E-03	&(	1.861E-01	5.52E-02	G K
		105.31	8.224E-02	%	2.152E-01	6.49E-02	G
HG-203	-8.3989E-03						
		279.17	-8.399E-03	&(	5.506E-02	1.62E-02	G K
		72.87	-2.822E-01	& P	1.299E+00	3.89E-01	G
		70.83	-1.113E-01	%	2.022E+00	6.00E-01	G
		82.50	2.650E-02	&	2.865E+00	8.49E-01	G
TL-208	2.4671E-01						
		583.14	2.467E-01	(P	4.775E-02	2.57E-02	G
		510.72	4.481E-01	+ P	2.518E-01	9.81E-02	G
PB-212	5.4056E-01						
		238.63	5.096E-01	(P	1.183E-01	4.42E-02	G K
							Energy duplication
		77.11	5.948E-01	(	3.428E-01	1.11E-01	G
		74.81	5.805E-01	&(P	7.109E-01	2.19E-01	G
PB-214	3.9162E-01						
		351.99	4.056E-01	(P	9.906E-02	4.22E-02	G K
		295.22	3.646E-01	(P	1.935E-01	6.72E-02	G
							Energy duplication
		77.11	9.525E-01	+ P	5.629E-01	1.81E-01	G
		241.92	3.558E-01	% P	7.620E-01	2.31E-01	G
BI-212	4.8908E-01						
		727.17	4.891E-01	(P	4.064E-01	1.40E-01	G K
		1620.56	0.000E+00	%	3.499E+00	9.49E-01	G
		785.42	-2.055E-01	% P	2.778E+00	7.70E-01	G
BI-214	4.1516E-01						
		609.32	4.152E-01	(P	9.278E-02	4.59E-02	G K
		1764.51	5.768E-01	+ P	1.884E-01	1.23E-01	G
		1120.28	1.173E+00	+ P	4.722E-01	2.34E-01	G
RA-224	1.3817E+00						
		241.00	1.382E+00	(P	1.328E+00	4.18E-01	G
RA-226	1.6311E+00						
		185.99	1.631E+00	*(	1.196E+00	3.86E-01	G
AC-228	5.5464E-01						
		911.07	5.407E-01	(P	2.016E-01	8.44E-02	G K
		968.90	5.055E-01	(P	4.037E-01	1.38E-01	G
		338.40	6.598E-01	(P	3.423E-01	1.20E-01	G

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

TH-227      -5.7288E-02
                          236.00-5.729E-02 %(P 4.971E-01 1.47E-01 G K
                          256.25 2.170E-02 & P 5.407E-01 1.56E-01 G

PA-234       6.6723E-04
                           98.44 6.672E-04 &(  1.831E-01 5.40E-02 G K
                          946.00-3.311E-02 &   3.675E-01 1.04E-01 G
                          131.28 1.874E-03 &   2.017E-01 5.93E-02 G
                           94.67-1.262E-01 %   3.546E-01 1.07E-01 G
                          883.24-1.263E-03 %   4.285E-01 1.15E-01 G
                          926.70 1.340E-01 %   4.980E-01 1.44E-01 G
                          569.26 2.295E-02 %   4.241E-01 1.18E-01 G

TH-234       1.7848E+00
                           63.29 1.004E+00 %(P 2.210E+00 6.66E-01 G K
                           92.80 2.453E+00  (P 1.660E+00 5.29E-01 G
                           92.38 2.190E+00  (P 2.054E+00 6.38E-01 G

AM-241       2.0668E-03
                           59.54 2.067E-03 %(P 3.063E-01 9.03E-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	-3.2383E-02	-3.2870E-02	3.6106E-01	3.6107E-01	4.180E-01
K-40		1.3429E+01	1.3429E+01	1.9896E+00	2.1294E+00	
MN-54	#A	1.0148E-02	1.0174E-02	3.5994E-02	3.5998E-02	4.235E-02
CO-57	#B	4.4748E-03	4.4880E-03	4.3998E-02	4.3999E-02	4.941E-02
CO-60	#B	2.2985E-02	2.2994E-02	6.6392E-02	6.6404E-02	7.591E-02
Sr-85	#A	-1.1562E-02	-1.1705E-02	6.0929E-02	6.0933E-02	6.847E-02
Kr-85	#A	-3.0355E+02	-3.0355E+02	1.7708E+03	1.7709E+03	1.589E+03
Y-88	#B	-4.0924E-03	-4.1231E-03	3.5780E-02	3.5781E-02	4.803E-02
NB-94	#B	-2.3146E-03	-2.3146E-03	4.3725E-02	4.3725E-02	4.275E-02
Ag-108M	#B	2.1710E-03	2.1710E-03	9.0744E-02	9.0744E-02	1.050E-01
CD-109	#A	-3.5824E-02	-3.5887E-02	2.1664E+00	2.1664E+00	1.686E+00
SN-113	#B	3.2571E-04	3.2797E-04	5.5383E-02	5.5383E-02	6.470E-02
SB-125	#B	2.5837E-03	2.5858E-03	1.2885E-01	1.2885E-01	1.515E-01
I-131	#B	-1.2690E-03	-1.4011E-03	4.6221E-02	4.6222E-02	4.899E-02
CS-134	#B	-2.6060E-02	-2.6088E-02	6.4414E-02	6.4430E-02	6.670E-02
CS-137		1.3371E-01	1.3372E-01	1.0472E-01	1.0499E-01	
CE-139	#A	3.1121E-03	3.1302E-03	4.5247E-02	4.5247E-02	5.094E-02
EU-152	#B	1.3833E-03	1.3835E-03	1.2755E-01	1.2755E-01	1.445E-01
EU-154	#B	8.8924E-03	8.8947E-03	9.5338E-02	9.5339E-02	1.074E-01
EU-155	#B	6.6270E-03	6.6299E-03	1.6572E-01	1.6572E-01	1.860E-01
HG-203	#B	-8.2565E-03	-8.3989E-03	4.8567E-02	4.8570E-02	5.413E-02
TL-208		2.4671E-01	2.4671E-01	7.6988E-02	7.8240E-02	
PB-212	#	5.4056E-01	5.4056E-01	1.4071E-01	1.4399E-01	1.183E-01
PB-214	#	3.9162E-01	3.9162E-01	1.2232E-01	1.2430E-01	9.906E-02
BI-212	#	4.8908E-01	4.8908E-01	4.2121E-01	4.2211E-01	4.064E-01
BI-214		4.1516E-01	4.1516E-01	1.3780E-01	1.3978E-01	
RA-224	#	1.3817E+00	1.3817E+00	1.2527E+00	1.2552E+00	1.328E+00
RA-226	#	1.6311E+00	1.6311E+00	1.1580E+00	1.1617E+00	1.196E+00
AC-228	#	5.5464E-01	5.5464E-01	2.0175E-01	2.0417E-01	2.016E-01
TH-227	#B	-5.7288E-02	-5.7288E-02	4.8165E-01	4.8167E-01	4.971E-01
PA-234	#B	6.6723E-04	6.6723E-04	1.6188E-01	1.6188E-01	1.831E-01
TH-234	#B	1.7848E+00	1.7848E+00	1.1542E+00	1.1584E+00	2.210E+00
AM-241	#A	2.0668E-03	2.0668E-03	2.7077E-01	2.7077E-01	3.063E-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) 1.4224393E+01 pCi/gm
Total Decayed Activity (295.1 to 1999.1 keV) 1.4224402E+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_13JUL2006_1746.An1

Sample description
FSS-OOL-14-01-017-F-B

Spectrum Filename: C:\GammaVision\Spectra\101F_13JUL2006_1746.An1

Acquisition information
Start time: 13-Jul-2006 17:46:19
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: 2.0020E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0020E+03) =
4.9950E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

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

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

Corrections	Status	Comments
Decay correct to date:	YES	11-Jul-2006 11:00:00
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. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1882

***** 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	195.	16.78	1.00	1.651E-02				
74.75	195.	16.78	1.00	1.651E-02	74.81	9.600	8.076E-01	PB212
77.14	310.	10.74	1.01	1.720E-02	77.11	10.700	1.122E+00	PB214
					77.11	17.500	6.945E-01	PB212
93.17	105.	37.87	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.29	128.	21.32	1.75	1.856E-02	185.99	3.280	1.420E+00	RA226
238.89	702.	4.46	1.12	1.556E-02	238.63	43.100	6.994E-01	PB212
241.59	96.	23.80	1.12	1.542E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	5.593E-01	PB214
270.76	55.	38.69	1.16	1.398E-02				
295.50	171.	11.27	1.16	1.291E-02	295.22	19.200	4.591E-01	PB214
300.32	55.	25.50	1.16	1.272E-02				
338.46	124.	16.51	1.37	1.135E-02	338.40	12.010	6.012E-01	AC228
352.13	263.	11.01	1.20	1.092E-02	351.99	37.100	4.350E-01	PB214
463.23	42.	39.18	1.48	8.347E-03				
463.23	42.	39.18	1.48	8.347E-03	463.51	10.000	PBC<MDA	SB125
511.20	84.	20.68	1.37	7.584E-03	510.72	22.500	2.702E-01	TL208
583.43	202.	10.11	1.64	6.681E-03	583.14	86.000	2.343E-01	TL208
609.49	162.	11.11	1.20	6.411E-03	609.32	46.090	3.663E-01	BI214
661.76	75.	22.33	1.02	5.936E-03	661.62	84.620	9.945E-02	CS137
727.15	75.	24.98	1.68	5.443E-03				
727.15	75.	24.98	1.68	5.443E-03	727.17	11.800	7.811E-01	BI212
911.60	147.	12.27	1.79	4.444E-03	911.07	29.000	7.618E-01	AC228
968.17	102.	16.89	1.36	4.215E-03	968.90	17.460	9.333E-01	AC228
1121.07	51.	22.52	1.99	3.711E-03	1120.28	15.040	6.170E-01	BI214
1237.87	44.	36.80	0.99	3.402E-03				

1461.44	626.	4.14	2.03	2.941E-03	1460.75	10.700	1.337E+01	K40
1765.26	25.	20.00	1.83	2.481E-03	1764.51	15.920	4.197E-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	
149.07	74.72	439.	195.	0.097	50.40	1.005	BI-207	D
477.47	238.81	139.	702.	0.351	13.38	1.122	PB-212	D
541.24	270.76	184.	55.	0.028	116.06	1.164	AC-228	
600.19	300.22	86.	49.	0.024	90.04	0.890	PB-212	
2476.47	1237.87	65.	44.	0.022	110.39	0.988	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	146.78	73.61	1008.	-121.	-0.060	114.89	1.499s
PB-212	149.46	74.95	1066.	169.	0.085	82.35	1.499s
PB-214	153.79	77.11	402.	306.	0.153	32.22	1.006D
PB-212	153.79	77.11	927.	258.	0.129	53.52	1.499D
TH-234	185.91	93.17	841.	105.	0.053	113.62	1.499s
RA-226	372.24	186.29	295.	128.	0.064	63.97	1.747s
PB-212	477.30	238.80	377.	544.	0.272	19.61	1.499
PB-214	483.54	241.92	142.	99.	0.050	58.54	1.124D
PB-214	590.53	295.39	222.	188.	0.094	45.55	0.994s
AC-228	676.71	338.46	130.	121.	0.061	49.54	1.371
PB-214	704.05	352.13	177.	261.	0.131	33.04	1.204
SB-125	925.93	463.02	83.	40.	0.020	102.92	1.499
TL-208	1022.34	511.20	98.	68.	0.034	62.05	1.371s
TL-208	1166.87	583.43	76.	200.	0.100	30.33	1.639s
BI-214	1219.02	609.49	61.	160.	0.080	33.34	1.196
CS-137	1323.60	661.76	63.	74.	0.037	67.00	1.024
BI-212	1455.21	727.53	42.	50.	0.025	68.52	1.499
AC-228	1823.56	911.60	50.	146.	0.073	36.82	1.792s
AC-228	1936.75	968.17	55.	102.	0.051	50.66	1.360s
BI-214	2242.74	1121.07	31.	51.	0.026	67.57	1.994s
K-40	2923.90	1461.44	12.	624.	0.312	12.41	2.034
BI-214	3531.96	1765.26	0.	25.	0.012	60.00	1.832

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		-2.8343E-02					
			477.56	-2.834E-02	%(	3.865E-01 1.12E-01	G
K-40		1.3368E+01					
			1460.75	1.337E+01	(P	4.110E-01 5.55E-01	G
MN-54		-7.0621E-03					
			834.81	-7.062E-03	%(P	4.951E-02 1.41E-02	G
CO-57		-2.5161E-04					
			122.07	-2.516E-04	%(	4.270E-02 1.27E-02	G K
			136.43	-3.855E-02	%	3.765E-01 1.12E-01	G
CO-60		2.3983E-02					
			1332.51	2.398E-02	%(P	5.097E-02 1.55E-02	G K
			1173.23	-2.245E-03	& P	6.319E-02 1.77E-02	G K
Sr-85		-9.7391E-03					
			514.00	-9.739E-03	&(	5.315E-02 1.57E-02	G
Kr-85		-2.4438E+02					
			513.99	-2.444E+02	&(P	1.202E+03 3.53E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	4.779E-02 1.21E-02	G K
			898.02	-3.599E-03	% P	4.858E-02 1.36E-02	G
NB-94		2.2219E-02					
			871.10	2.222E-02	&(P	3.874E-02 1.20E-02	G K
			702.50	6.484E-03	& P	4.265E-02 1.23E-02	G K
Ag-108M		-3.7369E-04					
			722.95	-3.737E-04	%(	4.518E-02 1.26E-02	G K
			614.37	-3.630E-03	% P	5.067E-02 1.45E-02	G
			433.93	-2.169E-03	%	4.104E-02 1.18E-02	G
CD-109		-1.8117E-02					
			88.04	-1.812E-02	%(P	1.391E+00 4.14E-01	G
SN-113		-7.5152E-03					
			391.71	-7.515E-03	%(	6.377E-02 1.87E-02	G K
			255.04	1.328E-03	% P	1.495E+00 4.35E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	9.3884E-02						
		427.95	1.525E-02	%(P	1.261E-01	3.67E-02	G K
		600.77	5.984E-02	% P	2.201E-01	6.48E-02	G
		636.15	-4.348E-03	& P	3.566E-01	1.00E-01	G
		463.51	3.266E-01	(P	3.664E-01	1.16E-01	G
		176.29	3.759E-03	% P	5.973E-01	1.77E-01	G
I-131	6.3210E-03						
		364.48	6.321E-03	%(	5.153E-02	1.51E-02	G K
		636.97	-7.791E-03	&	6.557E-01	1.84E-01	G
		284.29	9.413E-02	&	6.958E-01	2.05E-01	G
CS-134	-9.5029E-03						
		604.66	-9.503E-03	%(P	4.962E-02	1.45E-02	G K
		795.76	2.537E-02	% P	5.553E-02	1.68E-02	G
		569.29	7.753E-02	& P	1.764E-01	5.30E-02	G
		801.84	0.000E+00	%	5.597E-01	1.57E-01	G
CS-137	9.9453E-02						
		661.62	9.945E-02	(P	5.333E-02	2.25E-02	G
CE-139	1.4842E-02						
		165.85	1.484E-02	&(P	4.326E-02	1.30E-02	G
EU-152	-3.9261E-02						
		121.78	-3.926E-02	%(P	1.319E-01	3.96E-02	G K
		344.30	1.726E-02	& P	1.378E-01	4.04E-02	G
		1408.08	-7.896E-02	% P	2.578E-01	7.49E-02	G
		964.00	6.888E-02	& P	4.770E-01	1.38E-01	G
		1112.07	1.034E-01	% P	4.603E-01	1.34E-01	G
		778.90	-9.939E-04	% P	4.322E-01	1.23E-01	G
EU-154	-2.6984E-02						
		123.10	-2.698E-02	%(P	1.004E-01	3.01E-02	G K
		1274.80	-4.048E-03	& P	1.696E-01	4.70E-02	G
		723.30	1.219E-02	% P	2.111E-01	5.94E-02	G
		1004.80	6.708E-02	& P	2.545E-01	7.39E-02	G
EU-155	9.0662E-02						
		86.45	9.066E-02	%(	1.631E-01	4.96E-02	G K
		105.31	8.208E-02	%	1.811E-01	5.48E-02	G
HG-203	2.5596E-02						
		279.17	2.560E-02	&(	4.421E-02	1.35E-02	G K
		72.87	-3.446E-01	% P	1.180E+00	3.55E-01	G
		70.83	-1.583E+00	+	1.976E+00	6.06E-01	G
		82.50	-3.687E-01	%	2.454E+00	7.35E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.4174E-01						
		583.14	2.343E-01	(P	5.103E-02	2.40E-02	G
		510.72	2.702E-01	*(P	1.927E-01	6.91E-02	G
PB-212	5.5548E-01						
		238.63	5.466E-01	(P	9.371E-02	3.61E-02	G K
							Energy duplication
		77.11	5.775E-01	(	3.241E-01	1.03E-01	G
		74.81	7.197E-01	& P	6.583E-01	2.04E-01	G
PB-214	4.7533E-01						
		351.99	4.350E-01	(P	1.077E-01	4.83E-02	G K
		295.22	5.111E-01	@(P	1.964E-01	7.84E-02	G
							Energy duplication
		77.11	1.122E+00	+ P	3.525E-01	1.22E-01	G
		241.92	5.835E-01	(P	3.412E-01	1.15E-01	G
BI-212	5.2514E-01						
		727.17	5.251E-01	(P	3.469E-01	1.22E-01	G K
		1620.56	9.769E-02	%	1.364E+00	3.52E-01	G
		785.42	1.174E-01	% P	2.331E+00	6.58E-01	G
BI-214	3.8001E-01						
		609.32	3.663E-01	(P	8.904E-02	4.10E-02	G K
		1764.51	4.197E-01	(P	1.259E-01	8.55E-02	G
		1120.28	6.170E-01	+ P	3.465E-01	1.40E-01	G
RA-224	8.2364E-01						
		241.00	8.236E-01	%(P	1.159E+00	3.56E-01	G
RA-226	1.4197E+00						
		185.99	1.420E+00	*(	9.161E-01	3.03E-01	G
AC-228	8.2625E-01						
		911.07	7.618E-01	*(P	1.875E-01	9.47E-02	G K
		968.90	9.333E-01	@(P	3.430E-01	1.59E-01	G
		338.40	6.012E-01	- P	2.761E-01	1.01E-01	G
TH-227	-1.1163E-01						
		236.00	-1.116E-01	%(P	4.019E-01	1.21E-01	G K
		256.25	-1.065E-01	% P	5.564E-01	1.65E-01	G
PA-234	5.8523E-02						
		98.44	5.852E-02	%(	1.615E-01	4.87E-02	G K
		946.00	-3.555E-02	%	2.927E-01	8.41E-02	G
		131.28	6.183E-02	&	1.808E-01	5.45E-02	G
		94.67	-1.046E-01	%	3.142E-01	9.48E-02	G
		883.24	-9.343E-02	%	4.494E-01	1.31E-01	G
		926.70	1.466E-01	%	3.873E-01	1.15E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 2.588E-02 &   2.314E-01 6.43E-02 G

TH-234       8.5264E-01
                           63.29 5.931E-01 %(P 2.043E+00 6.13E-01 G K
                           92.80 1.190E+00  (P 1.559E+00 4.77E-01 G
                           92.38-2.422E-01 & P 1.853E+00 5.49E-01 G

AM-241      -7.0669E-04
                           59.54-7.067E-04 %(P 2.334E-01 6.90E-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	-2.7516E-02	-2.8343E-02	3.3450E-01	3.3451E-01	3.752E-01
K-40		1.3368E+01	1.3368E+01	1.6657E+00	1.8289E+00	
MN-54	#A	-7.0264E-03	-7.0621E-03	5.0126E-02	5.0128E-02	4.926E-02
CO-57	#B	-2.5014E-04	-2.5161E-04	3.7960E-02	3.7960E-02	4.245E-02
CO-60	#B	2.3963E-02	2.3983E-02	4.6365E-02	4.6385E-02	5.093E-02

Sr-85	#A	-9.5044E-03	-9.7391E-03	4.6978E-02	4.6981E-02	5.187E-02
Kr-85	#A	-2.4437E+02	-2.4438E+02	1.2942E+03	1.2943E+03	1.202E+03
Y-88	#B	0.0000E+00	0.0000E+00	3.6397E-02	3.6398E-02	4.709E-02
NB-94	#B	2.2219E-02	2.2219E-02	3.5949E-02	3.5971E-02	3.874E-02
Ag-108M	#B	-3.7367E-04	-3.7369E-04	3.7833E-02	3.7833E-02	4.518E-02
CD-109	#A	-1.8054E-02	-1.8117E-02	2.0257E+00	2.0257E+00	1.386E+00
SN-113	#B	-7.4126E-03	-7.5152E-03	5.6040E-02	5.6041E-02	6.290E-02
SB-125	#B	9.3737E-02	9.3884E-02	1.0010E-01	1.0024E-01	1.260E-01
I-131	#B	5.1921E-03	6.3210E-03	4.5157E-02	4.5158E-02	4.232E-02
CS-134	#B	-9.4829E-03	-9.5029E-03	4.9888E-02	4.9891E-02	4.952E-02
CS-137		9.9439E-02	9.9453E-02	6.7431E-02	6.7665E-02	
CE-139	#A	1.4672E-02	1.4842E-02	3.9062E-02	3.9071E-02	4.277E-02
EU-152	#B	-3.9248E-02	-3.9261E-02	1.2424E-01	1.2426E-01	1.319E-01
EU-154	#B	-2.6970E-02	-2.6984E-02	9.5398E-02	9.5410E-02	1.003E-01
EU-155	#B	9.0583E-02	9.0662E-02	1.4881E-01	1.4890E-01	1.630E-01
HG-203	#B	2.4741E-02	2.5596E-02	4.0531E-02	4.0556E-02	4.274E-02
TL-208		2.4174E-01	2.4174E-01	7.4204E-02	7.5450E-02	
PB-212	#	5.5548E-01	5.5548E-01	1.1018E-01	1.1456E-01	9.371E-02
PB-214		4.7533E-01	4.7533E-01	1.2966E-01	1.3241E-01	
BI-212	#	5.2514E-01	5.2514E-01	3.6473E-01	3.6593E-01	3.469E-01
BI-214		3.8001E-01	3.8001E-01	1.2758E-01	1.2937E-01	
RA-224	#A	8.2364E-01	8.2364E-01	1.0669E+00	1.0680E+00	1.159E+00
RA-226	#	1.4197E+00	1.4197E+00	9.0821E-01	9.1174E-01	
AC-228		8.2625E-01	8.2625E-01	2.6105E-01	2.6519E-01	
TH-227	#B	-1.1163E-01	-1.1163E-01	3.7257E-01	3.7263E-01	4.019E-01
PA-234	#B	5.8523E-02	5.8523E-02	1.4613E-01	1.4617E-01	1.615E-01
TH-234	#B	8.5264E-01	8.5264E-01	1.0257E+00	1.0267E+00	2.043E+00
AM-241	#A	-7.0669E-04	-7.0669E-04	4.4580E-01	4.4580E-01	2.334E-01

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

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

Total Activity (270.6 to 1999.1 keV) 1.6810303E+01 pCi/gm
Total Decayed Activity (270.6 to 1999.1 keV) 1.6810322E+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_13JUL2006_1824.An1

Sample description
FSS-OOL-14-01-013-F

Spectrum Filename: C:\GammaVision\Spectra\101F_13JUL2006_1824.An1

Acquisition information

Start time:	13-Jul-2006 18:24:57
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:	1.2190E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.2190E+03) = 8.2034E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

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

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

Corrections	Status	Comments
Decay correct to date:	YES	12-Jul-2006 11:27:00
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. 10 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.3034

***** 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	127.	17.31	1.00	1.664E-02	74.81	9.600	8.499E-01	PB212
77.16	214.	10.45	1.01	1.734E-02	77.11	10.700	1.265E+00	PB214
					77.11	17.500	7.869E-01	PB212
92.89	96.	27.21	1.50	2.008E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	3.413E-01	PA234
92.89	86.	32.29	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	PBC<MDA	PA234
92.92	73.	36.50	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	PBC<MDA	PA234
185.69	73.	32.43	1.31	1.860E-02				
185.69	73.	32.43	1.31	1.860E-02	185.99	3.280	1.328E+00	RA226
238.86	394.	5.86	1.12	1.556E-02	238.63	43.100	6.411E-01	PB212
					241.92	7.470	3.793E+00	PB214
241.97	56.	29.35	1.12	1.540E-02				
295.03	92.	18.38	0.90	1.293E-02				
295.03	92.	18.38	0.90	1.293E-02	295.22	19.200	4.009E-01	PB214
338.65	89.	20.75	1.46	1.134E-02	338.40	12.010	7.060E-01	AC228
352.13	150.	10.45	1.05	1.092E-02	351.99	37.100	4.043E-01	PB214
463.31	57.	25.80	1.58	8.345E-03				
463.31	57.	25.80	1.58	8.345E-03	463.51	10.000	7.443E-01	SB125
511.29	79.	20.28	1.60	7.582E-03	510.72	22.500	4.114E-01	TL208
583.54	108.	13.87	1.18	6.680E-03	583.14	86.000	2.041E-01	TL208
609.62	110.	12.64	1.32	6.410E-03	609.32	46.090	4.084E-01	BI214
662.18	105.	13.38	1.34	5.933E-03	661.62	84.620	2.289E-01	CS137

727.32	44.	27.97	1.02	5.442E-03	727.17	11.800	7.443E-01	BI212
911.70	64.	18.13	1.12	4.444E-03	911.07	29.000	5.367E-01	AC228
968.67	63.	18.25	1.61	4.213E-03				
968.67	63.	18.25	1.61	4.213E-03	968.90	17.460	9.328E-01	AC228

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1120.88	38.	32.35	0.70	3.711E-03	1120.28	15.040	7.472E-01	BI214
1461.43	322.	5.80	1.73	2.941E-03	1460.75	10.700	1.124E+01	K40
1765.39	18.	23.57	1.25	2.481E-03	1764.51	15.920	4.928E-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	
148.95	75.15	178.	127.	0.063	51.93	1.005	PB-214	D
153.88	77.62	142.	214.	0.107	31.34	1.007	PB-214	D
477.42	238.90	70.	394.	0.197	17.57	1.122	PB-212	D
483.64	242.01	105.	56.	0.028	88.05	1.124	PB-214	D

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

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.07	74.75	487.	111.	0.056	84.55	1.499
PB-214	153.79	77.11	438.	173.	0.087	54.75	1.499D
PB-212	153.79	77.11	434.	177.	0.089	54.75	1.499D
TH-234	185.36	92.89	403.	86.	0.043	96.88	1.499s
PA-234	185.36	92.89	292.	96.	0.048	81.62	1.499
RA-226	371.68	186.01	216.	68.	0.034	98.75	1.499s
PB-212	477.41	238.86	236.	293.	0.147	27.60	1.499
PB-214	590.61	295.43	87.	77.	0.039	60.15	1.499s
AC-228	676.98	338.60	67.	74.	0.037	56.75	1.499s
PB-214	704.06	352.13	54.	134.	0.067	34.23	1.499
SB-125	926.52	463.31	47.	36.	0.018	90.30	1.499s
TL-208	1022.52	511.29	65.	63.	0.032	60.83	1.603s
TL-208	1167.09	583.54	40.	106.	0.053	41.62	1.179
BI-214	1219.28	609.62	33.	109.	0.054	37.91	1.320s
CS-137	1324.45	662.18	30.	104.	0.052	40.13	1.338s
BI-212	1454.80	727.32	33.	43.	0.022	83.90	1.018
AC-228	1823.80	911.72	17.	60.	0.030	46.51	1.578
AC-228	1939.18	969.38	28.	30.	0.015	91.17	1.616s
BI-214	2242.35	1120.88	29.	38.	0.019	97.04	0.700s
K-40	2923.88	1461.43	9.	319.	0.160	17.41	1.732
BI-214	3532.21	1765.39	0.	18.	0.009	70.71	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	Code	MDA Value pCi/gm	COMMENTS
BE-7		1.0033E-01					
			477.56	1.003E-01	&(	3.712E-01 1.08E-01	G
K-40		1.1243E+01					
			1460.75	1.124E+01	(P	5.788E-01 6.58E-01	G
MN-54		-9.7669E-04					
			834.81	-9.767E-04	%(P	6.683E-02 1.83E-02	G
CO-57		7.4493E-03					
			122.07	7.449E-03	&(	4.611E-02 1.37E-02	G K
			136.43	0.000E+00	&	4.325E-01 1.27E-01	G
CO-60		1.2627E-02					
			1332.51	1.263E-02	%(P	7.206E-02 2.01E-02	G K
			1173.23	3.554E-04	& P	7.123E-02 1.90E-02	G K
Sr-85		-8.6115E-03					
			514.00	-8.612E-03	%(	5.327E-02 1.54E-02	G
Kr-85		-2.3620E+02					
			513.99	-2.362E+02	%(P	1.226E+03 3.50E+02	G
Y-88		-4.7272E-03					
			1836.01	-4.727E-03	%(	6.081E-02 1.53E-02	G K
			898.02	-5.352E-04	% P	5.078E-02 1.32E-02	G
NB-94		3.7050E-03					
			871.10	3.705E-03	%(P	5.451E-02 1.48E-02	G K
			702.50	-8.085E-03	& P	6.148E-02 1.75E-02	G K
Ag-108M		-6.9867E-03					
			722.95	-6.987E-03	&(	6.074E-02 1.71E-02	G K
			614.37	-2.563E-02	& P	7.890E-02 2.34E-02	G
			433.93	6.854E-03	%	4.888E-02 1.40E-02	G
CD-109		-3.7970E-01					
			88.04	-3.797E-01	%(P	1.450E+00 4.34E-01	G
SN-113		-6.8106E-03					
			391.71	-6.811E-03	%(	7.486E-02 2.15E-02	G K
			255.04	-4.018E-02	% P	1.841E+00 5.29E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.1235E-01						
		427.95	-1.286E-02	%(P	1.411E-01	3.99E-02	G K
		600.77	2.754E-02	% P	2.525E-01	7.07E-02	G
		636.15	-4.571E-03	& P	4.890E-01	1.35E-01	G
		463.51	4.830E-01	(P	4.616E-01	1.51E-01	G
		176.29	7.808E-02	% P	7.064E-01	2.08E-01	G
I-131	0.0000E+00						
		364.48	0.000E+00	%(	6.853E-02	1.96E-02	G K
		636.97	2.408E-01	&	7.275E-01	2.14E-01	G
		284.29	-2.024E-01	%	7.692E-01	2.28E-01	G
CS-134	1.6920E-03						
		604.66	1.692E-03	%(P	5.243E-02	1.45E-02	G K
		795.76	-7.961E-04	% P	6.678E-02	1.80E-02	G
		569.29	-5.491E-03	% P	3.155E-01	8.66E-02	G
		801.84	3.679E-03	%	5.030E-01	1.32E-01	G
CS-137	2.2886E-01						
		661.62	2.289E-01	@(P	6.257E-02	3.09E-02	G
CE-139	7.9172E-03						
		165.85	7.917E-03	&(P	5.650E-02	1.67E-02	G
EU-152	-5.3278E-03						
		121.78	-5.328E-03	&(P	1.409E-01	4.13E-02	G K
		344.30	1.669E-03	% P	1.615E-01	4.59E-02	G
		1408.08	1.067E-01	% P	2.536E-01	7.57E-02	G
		964.00	1.256E-01	% P	4.752E-01	1.37E-01	G
		1112.07	-2.371E-03	% P	7.998E-01	2.25E-01	G
		778.90	-6.666E-02	% P	4.682E-01	1.32E-01	G
EU-154	1.5002E-02						
		123.10	1.500E-02	&(P	9.514E-02	2.81E-02	G K
		1274.80	-2.056E-02	% P	2.143E-01	5.89E-02	G
		723.30	-8.252E-02	& P	3.753E-01	1.09E-01	G
		1004.80	-3.008E-02	% P	3.436E-01	9.38E-02	G
EU-155	1.1721E-01						
		86.45	1.172E-01	%(	1.795E-01	5.49E-02	G K
		105.31	3.093E-02	%	2.065E-01	6.13E-02	G
HG-203	1.1721E-03						
		279.17	1.172E-03	&(	5.372E-02	1.55E-02	G K
		72.87	-2.212E-01	% P	1.185E+00	3.53E-01	G
		70.83	-4.519E-02	%	2.789E+00	8.30E-01	G
		82.50	6.601E-01	%	2.329E+00	6.97E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.0407E-01						
		583.14	2.041E-01	(P	6.219E-02	2.90E-02	G
		510.72	4.114E-01	+ P	2.608E-01	1.05E-01	G
PB-212	4.8463E-01						
		238.63	4.846E-01	(P	1.227E-01	4.55E-02	G K
							Energy duplication
		77.11	6.524E-01	+	3.675E-01	1.19E-01	G
		74.81	7.772E-01	& P	7.366E-01	2.29E-01	G
PB-214	3.5820E-01						
		351.99	3.652E-01	(P	1.009E-01	4.23E-02	G K
		295.22	3.446E-01	@(P	2.069E-01	7.07E-02	G
							Energy duplication
		77.11	1.045E+00	+ P	6.036E-01	1.95E-01	G
		241.92	9.723E-02	% P	7.416E-01	2.19E-01	G
BI-212	7.4431E-01						
		727.17	7.443E-01	(P	5.080E-01	2.11E-01	G K
		1620.56	5.462E-01	%	1.798E+00	5.10E-01	G
		785.42	-1.760E-02	% P	2.998E+00	8.17E-01	G
BI-214	4.3010E-01						
		609.32	4.084E-01	@(P	1.107E-01	5.22E-02	G K
		1764.51	4.928E-01	(P	2.068E-01	1.19E-01	G
		1120.28	7.472E-01	+ P	5.556E-01	2.44E-01	G
RA-224	9.7228E-01						
		241.00	9.723E-01	&(P	1.387E+00	4.27E-01	G
RA-226	1.2345E+00						
		185.99	1.234E+00	(	1.294E+00	4.06E-01	G
AC-228	5.0996E-01						
		911.07	5.123E-01	(P	1.862E-01	8.19E-02	G K
		968.90	4.455E-01	@(P	4.118E-01	1.39E-01	G
		338.40	5.981E-01	(P	3.321E-01	1.17E-01	G
TH-227	1.9937E-02						
		236.00	1.994E-02	&(P	4.006E-01	1.17E-01	G K
		256.25	6.391E-02	& P	5.861E-01	1.70E-01	G
PA-234	1.0027E-01						
		98.44	-4.856E-02	&(	1.942E-01	5.81E-02	G K
		946.00	3.768E-02	%	3.075E-01	8.56E-02	G
		131.28	2.802E-03	&	2.285E-01	6.72E-02	G
		94.67	3.413E-01	?(	2.932E-01	9.29E-02	G
		883.24	-4.427E-02	%	4.991E-01	1.38E-01	G
		926.70	0.000E+00	%	6.272E-01	1.71E-01	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-1.029E-01 %   5.282E-01 1.53E-01 G

TH-234       7.3869E-01
                           63.29 7.888E-02 %(P 2.468E+00 7.26E-01 G K
                           92.80 1.596E+00 @(P 1.787E+00 5.53E-01 G
                           92.38 1.596E+00 & P 2.188E+00 6.68E-01 G

AM-241       2.5531E-02
                           59.54 2.553E-02 &(P 3.181E-01 9.40E-02 G
   ( - This peak used in the nuclide activity average.

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

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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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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	9.8661E-02	1.0033E-01	3.2407E-01	3.2412E-01	3.651E-01
K-40		1.1243E+01	1.1243E+01	1.9719E+00	2.0717E+00	
MN-54	#A	-9.7390E-04	-9.7669E-04	1.0745E+01	1.0745E+01	6.664E-02
CO-57	#B	7.4246E-03	7.4493E-03	4.0969E-02	4.0971E-02	4.596E-02
CO-60	#B	1.2621E-02	1.2627E-02	6.0310E-02	6.0314E-02	7.202E-02

Sr-85	#A	-8.4936E-03	-8.6115E-03	4.6079E-02	4.6082E-02	5.254E-02
Kr-85	#A	-2.3620E+02	-2.3620E+02	1.4797E+03	1.4798E+03	1.226E+03
Y-88	#B	-4.6877E-03	-4.7272E-03	4.5982E-02	4.5983E-02	6.030E-02
NB-94	#B	3.7050E-03	3.7050E-03	4.4541E-02	4.4542E-02	5.451E-02
Ag-108M	#B	-6.9865E-03	-6.9867E-03	5.1169E-02	5.1171E-02	6.074E-02
CD-109	#A	-3.7895E-01	-3.7970E-01	1.3509E+00	1.3510E+00	1.447E+00
SN-113	#B	-6.7579E-03	-6.8106E-03	6.4633E-02	6.4634E-02	7.428E-02
SB-125	#B	1.1225E-01	1.1235E-01	1.0549E-01	1.0569E-01	1.409E-01
I-131	#B	0.0000E+00	0.0000E+00	5.8830E-02	5.8830E-02	6.132E-02
CS-134	#B	1.6899E-03	1.6920E-03	4.3503E-02	4.3503E-02	5.237E-02
CS-137	#	2.2884E-01	2.2886E-01	9.2616E-02	9.3515E-02	
CE-139	#A	7.8658E-03	7.9172E-03	5.0182E-02	5.0184E-02	5.613E-02
EU-152	#B	-5.3268E-03	-5.3278E-03	2.1277E-01	2.1277E-01	1.409E-01
EU-154	#B	1.4998E-02	1.5002E-02	8.4384E-02	8.4389E-02	9.512E-02
EU-155	#B	1.1715E-01	1.1721E-01	1.6483E-01	1.6496E-01	1.794E-01
HG-203	#B	1.1498E-03	1.1721E-03	4.6508E-02	4.6508E-02	5.270E-02
TL-208		2.0407E-01	2.0407E-01	8.6852E-02	8.7614E-02	
PB-212	#	4.8463E-01	4.8463E-01	1.3654E-01	1.3926E-01	1.227E-01
PB-214	#	3.5820E-01	3.5820E-01	1.2444E-01	1.2608E-01	1.009E-01
BI-212		7.4431E-01	7.4431E-01	6.3431E-01	6.3570E-01	
BI-214		4.3010E-01	4.3010E-01	1.6470E-01	1.6649E-01	
RA-224	#A	9.7228E-01	9.7228E-01	1.2810E+00	1.2822E+00	1.387E+00
RA-226	#A	1.2345E+00	1.2345E+00	1.2190E+00	1.2210E+00	1.294E+00
AC-228	#	5.0996E-01	5.0996E-01	2.0424E-01	2.0626E-01	1.862E-01
TH-227	#B	1.9937E-02	1.9937E-02	3.5053E-01	3.5053E-01	4.006E-01
PA-234	#B	1.0027E-01	1.0027E-01	8.1841E-02	8.2030E-02	1.942E-01
TH-234	#B	7.3869E-01	7.3869E-01	7.6708E-01	7.6818E-01	2.468E+00
AM-241	#A	2.5531E-02	2.5531E-02	2.8207E-01	2.8207E-01	3.181E-01

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

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

Total Activity (294.6 to 1999.1 keV) 1.2850682E+01 pCi/gm
Total Decayed Activity (294.6 to 1999.1 keV) 1.2850700E+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_0954.An1

Sample description
FSS-OOL-14-01-008-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\101F_15DEC2004_0954.An1

Acquisition information

Start time:	15-Dec-2004 09:55:42
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:	1.9220E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.9220E+03) = 5.2029E+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	14-Dec-2004 14:58:00
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	

Energy Calibration
Normalized diff: 0.1576

********** 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	
174.40	87.26	322.	115.	0.058	71.56	1.014	PB-214	D
179.67	89.90	248.	117.	0.059	63.46	1.016	PB-214	D
418.52	209.37	134.	90.	0.045	63.00	1.101	AC-228	D
540.25	270.26	77.	99.	0.049	74.20	1.247	AC-228	s
599.47	299.80	60.	38.	0.019	97.84	1.165	TH-227	D
655.90	328.06	35.	47.	0.023	91.28	1.243	AC-228	
818.89	409.52	24.	27.	0.014	123.23	1.125	AC-228	
925.48	462.79	36.	42.	0.021	82.07	0.744	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	177.	30.	0.015	197.39	0.994D
TH-234	126.14	63.29	263.	58.	0.029	125.85	0.997D
TA-182	135.68	68.06	178.	46.	0.023	166.72	0.555s
HG-203	145.31	72.87	369.	0.	0.000	0.00	0.893D
PB-212	149.19	74.81	313.	216.	0.108	40.37	1.005D
BI-207	149.51	74.97	376.	0.	0.000	0.00	0.000D
PB-214	153.79	77.11	312.	305.	0.152	30.02	1.006D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PB-212	153.79	77.11	455.	0.	0.000	547.92	0.000D
CE-144	159.81	80.12	308.	16.	0.008	469.52	1.009D
EU-155	172.48	86.45	349.	0.	0.000	0.00	1.013D
NP-237	172.56	86.49	286.	63.	0.031	120.80	1.013D
CD-109	175.66	88.04	419.	28.	0.014	317.66	1.014D
TH-234	184.34	92.38	380.	0.	0.000	0.00	1.018D
TH-234	185.18	92.80	244.	134.	0.067	55.98	1.018D
NP-237	191.32	95.87	220.	25.	0.013	258.69	1.020D
Cm-243	198.69	99.55	212.	72.	0.036	93.33	1.023D
Cm-243	207.11	103.76	211.	42.	0.021	154.56	1.026D
EU-155	210.21	105.31	213.	52.	0.026	124.90	1.027D
TE-132	221.29	110.85	171.	7.	0.004	749.25	0.400s
TE-132	232.06	116.23	125.	0.	0.000	0.00	1.035
Cm-243	233.71	117.05	122.	26.	0.013	250.74	1.095
EU-152	243.16	121.78	225.	10.	0.005	625.32	1.038D
CO-57	243.74	122.07	236.	0.	0.000	0.00	1.039D
EU-154	245.80	123.10	155.	17.	0.008	324.37	1.039D
CE-144	266.52	133.45	275.	91.	0.045	142.88	1.405s
CO-57	272.48	136.43	100.	0.	0.000	0.00	0.930D
U-235	287.14	143.76	161.	21.	0.010	270.64	1.054D
CE-141	290.52	145.45	230.	25.	0.013	261.37	1.055D
TE-131	299.07	149.72	251.	26.	0.013	262.80	1.058D
U-235	326.34	163.35	128.	43.	0.021	121.00	1.068D
CE-139	331.34	165.85	172.	31.	0.015	187.40	1.070D
SB-125	346.88	173.62	248.	39.	0.019	205.40	0.419s
U-235	371.10	185.72	228.	234.	0.117	6.02	1.084A
RA-226	371.64	185.99	164.	0.	0.000	5433.23	1.004A
U-235	410.29	205.31	161.	26.	0.013	216.60	1.098D
TE-132	456.32	228.31	63.	41.	0.021	125.25	0.833
TH-227	471.70	236.00	114.	28.	0.014	173.48	1.120D
PB-212	476.96	238.63	103.	636.	0.318	13.70	1.122D
RA-224	481.70	241.00	120.	70.	0.035	75.18	1.880A
PB-214	483.54	241.92	156.	64.	0.032	9.67	1.124A
SN-113	509.79	255.04	108.	0.	0.000	0.00	0.757D
TH-227	510.58	255.43	108.	26.	0.013	287.31	0.757s
Cm-243	554.93	277.60	71.	20.	0.010	186.39	1.149D
HG-203	558.07	279.17	112.	0.	0.000	0.00	1.150D
J-131	568.00	284.13	26.	2.	0.001	960.47	0.187s
PB-214	590.19	295.22	66.	140.	0.070	35.37	1.161D
CR-51	638.14	319.19	23.	1.	0.001	1787.46	0.300s
AC-228	676.09	338.15	98.	132.	0.066	47.87	1.081s
EU-152	687.37	343.79	32.	6.	0.003	380.10	0.481s
PB-214	703.64	351.92	70.	226.	0.113	26.97	1.174
J-131	726.00	363.10	31.	3.	0.002	731.96	0.552s
SN-113	780.11	390.14	46.	8.	0.004	367.42	0.926
SB-125	855.00	427.57	23.	2.	0.001	1146.30	0.000s
Ag-108M	866.27	433.20	24.	12.	0.006	194.36	1.358
TE-131	903.29	451.70	16.	1.	0.001	1412.99	0.428s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-125	927.15	463.63	68.	0.	0.000	0.00	1.278
TE-131	986.03	493.05	23.	11.	0.006	212.13	0.938
TL-208	1021.38	510.72	37.	83.	0.041	45.32	1.310D
Kr-85	1027.92	513.99	37.	8.	0.004	337.19	1.313D
CS-134	1137.00	568.50	14.	1.	0.001	1479.86	0.150s
BI-207	1139.00	569.50	11.	0.	0.000	0.00	0.000s
TL-208	1166.27	583.13	47.	176.	0.088	29.51	1.436
SB-125	1201.57	600.77	20.	0.	0.000	0.00	0.594D
CS-134	1209.35	604.66	26.	6.	0.003	364.63	1.374D
BI-214	1218.68	609.32	26.	163.	0.081	26.99	1.378D
Ag-108M	1228.78	614.37	40.	0.	0.000	0.00	0.505D
SB-125	1272.36	636.15	29.	0.	0.000	0.00	0.400D
J-131	1270.67	635.30	24.	5.	0.002	468.61	0.375s
AG-110M	1315.16	657.54	14.	0.	0.000	0.00	1.410
CS-137	1322.63	661.27	34.	44.	0.022	82.38	1.080
NB-94	1406.00	702.94	16.	8.	0.004	248.94	0.890s
Ag-108M	1446.05	722.95	27.	0.	0.000	0.00	1.454D
EU-154	1446.75	723.30	28.	3.	0.002	697.34	1.454D
BI-212	1454.49	727.17	32.	37.	0.018	82.73	1.457D
EU-152	1558.27	779.03	16.	7.	0.004	285.36	0.646s
BI-212	1574.38	787.08	17.	8.	0.004	271.42	0.394s
CS-134	1591.75	795.76	22.	0.	0.000	0.00	1.502
CS-134	1603.91	801.84	18.	0.	0.000	0.00	1.506
CO-58	1622.00	810.88	7.	0.	0.000	0.00	0.000s
MN-54	1672.00	835.87	26.	15.	0.008	183.60	0.706s
MN-56	1693.00	846.36	4.	0.	0.000	0.00	0.000s
NB-94	1737.88	868.79	13.	11.	0.005	191.21	0.427s
AG-110M	1770.17	884.92	15.	24.	0.012	114.56	2.048s
Y-88	1795.94	897.80	5.	1.	0.001	441.59	0.382s
AC-228	1822.11	910.88	27.	129.	0.064	35.80	1.260s
AG-110M	1876.57	938.10	22.	9.	0.005	283.78	0.486s
EU-152	1928.41	964.00	36.	21.	0.011	137.71	1.612D
AC-228	1938.21	968.90	33.	60.	0.030	56.19	1.616D
EU-154	2012.48	1006.01	10.	4.	0.002	439.16	0.481s
BI-207	2120.74	1060.11	22.	20.	0.010	145.79	0.715s
FE-59	2198.67	1099.05	14.	6.	0.003	301.39	0.437s
EU-152	2224.72	1112.07	22.	6.	0.003	347.42	1.708D
ZN-65	2231.62	1115.52	17.	10.	0.005	194.54	1.710D
BI-214	2241.15	1120.28	12.	45.	0.022	55.98	1.713D
TA-182	2243.15	1121.28	49.	0.	0.000	0.00	1.713D
TE-131	2294.33	1146.85	18.	14.	0.007	192.13	1.463
CO-60	2345.89	1172.62	34.	25.	0.013	112.83	0.993s
TA-182	2381.80	1190.56	16.	8.	0.004	279.28	0.802s
TA-182	2445.00	1222.14	21.	5.	0.002	454.97	0.000s
EU-154	2548.18	1273.70	8.	4.	0.002	363.12	0.690s
FE-59	2583.00	1291.10	2.	0.	0.000	0.00	0.000s
CO-60	2666.11	1332.63	16.	5.	0.003	168.18	0.814s
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	2817.00	1408.03	0.	8.	0.004	106.07	1.124s
K-40	2921.98	1460.48	17.	523.	0.262	13.99	2.012
BI-212	3241.60	1620.18	0.	10.	0.005	94.87	0.550s
BI-214	3531.04	1764.80	2.	18.	0.009	85.66	0.472s
MN-56	3623.67	1811.08	1.	0.	0.000	360.56	0.393s
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		2.2462E-02	1460.75	2.246E-02	(	9.329E-04	G
CR-51		0.0000E+00	320.07	0.000E+00	&	2.877E-04	G
MN-54		4.3130E-05	834.81	4.313E-05	&(	7.403E-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	%	1.277E-04	G
			1291.56	0.000E+00	?	8.874E-05	G
CO-57		0.0000E+00	122.07	0.000E+00	} P	5.549E-05	G
			136.43	0.000E+00	&	3.001E-04	G
CO-58		0.0000E+00	810.75	0.000E+00	?	4.143E-05	G
CO-60		0.0000E+00	1332.51	0.000E+00	% P	8.998E-05	G
			1173.23	9.654E-05	* P	1.128E-04	G
Cm-243		1.8502E-04	277.60	1.448E-04	(	2.962E-04	G
			117.00	1.510E-04	}	3.214E-04	G
			103.76	1.187E-04	(	1.999E-04	G
			99.55	3.309E-04	(	3.263E-04	G
ZN-65		7.2958E-05	1115.52	7.296E-05	(	1.559E-04	G
Kr-85		0.0000E+00	513.99	0.000E+00	%	1.293E+00	G
Y-88		0.0000E+00	1836.01	0.000E+00	? 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	2.5801E-05	871.10	3.116E-05	&(	5.762E-05	G
		702.50	2.045E-05	$(	5.205E-05	G
Ag-108M	0.0000E+00	722.95	0.000E+00	}	7.347E-05	G
		614.37	0.000E+00	&	7.590E-05	G
		433.93	2.112E-05	&	4.355E-05	G
AG-110M	0.0000E+00	657.75	0.000E+00		4.755E-05	G
		884.67	9.754E-05	@	8.436E-05	G
		937.48	8.478E-05	$	2.217E-04	G
		1384.27	0.000E+00	%	1.455E-04	G
CD-109	0.0000E+00	88.04	0.000E+00	%	1.811E-03	G
SN-113	0.0000E+00	391.71	0.000E+00	& P	7.359E-05	G
		255.04	0.000E+00	!	2.266E-03	G
SB-125	0.0000E+00	427.95	0.000E+00	%	1.276E-04	G
		600.77	0.000E+00	!	2.632E-04	G
		636.15	0.000E+00	}	5.476E-04	G
		463.51	0.000E+00		6.664E-04	G
		176.29	4.333E-04	&	8.533E-04	G
TE-131	1.1050E-04	149.72	2.511E-05	(	7.324E-05	G
		452.32	0.000E+00	%	1.845E-04	G
		1146.96	1.011E-03	$(	1.664E-03	G
		492.66	4.028E-04	?(	8.849E-04	G
TE-132	3.8782E-05	228.16	3.878E-05	(	3.755E-05	G
		116.30	0.000E+00	}	1.799E-03	G
		111.76	0.000E+00	&	2.210E-03	G
J-131	0.0000E+00	364.48	0.000E+00	&	4.503E-05	G
		636.97	0.000E+00	}	7.720E-04	G
		284.29	0.000E+00	%	4.414E-04	G
CS-134	0.0000E+00	604.66	0.000E+00	%	5.650E-05	G
		795.76	0.000E+00	%	7.698E-05	G
		569.29	0.000E+00	}	2.580E-04	G
		801.84	0.000E+00	%	6.932E-04	G
CS-137	1.1834E-04	661.62	1.183E-04	(	8.037E-05	G
CE-139	2.6443E-05	165.85	2.644E-05	(P	5.471E-05	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-141	3.4443E-05	145.45	3.444E-05	(	9.996E-05		G
CE-144	5.4182E-04	133.53	5.418E-04	*(	4.763E-04		G
		80.12	0.000E+00	%	3.978E-03		G
EU-152	0.0000E+00	121.78	0.000E+00	}	1.586E-04		G
		344.30	0.000E+00	%	1.297E-04		G
		1408.08	1.677E-04	?	1.545E-04		G
		964.00	4.602E-04		6.718E-04		G
		1112.07	0.000E+00	%	6.533E-04		G
		778.90	1.424E-04	?	4.343E-04		G
EU-154	0.0000E+00	123.10	0.000E+00	%	9.599E-05		G
		1274.80	0.000E+00	&	1.840E-04		G
		723.30	0.000E+00	}	3.416E-04		G
		1004.80	0.000E+00	&	3.352E-04		G
EU-155	1.5642E-04	86.45	0.000E+00	}	1.940E-04		G
		105.31	1.564E-04	$(	2.105E-04		G
TA-182	1.2901E-04	67.75	1.107E-04	(	1.543E-04		G
		1121.28	0.000E+00	%	3.679E-04		G
		1221.42	0.000E+00	%	3.448E-04		G
		1189.05	1.749E-04	&(	5.045E-04		G
HG-203	0.0000E+00	279.17	0.000E+00	% P	6.351E-05		G
		72.87	0.000E+00	&	1.225E-03		G
TL-208	4.1451E-04	583.14	4.145E-04	(	8.120E-05		G
		510.72	6.564E-04	+	2.459E-04		G
PB-212	1.2794E-03	238.63	1.279E-03	(	1.008E-04		G
		77.11	0.000E+00	}	4.583E-04		Energy duplication
		74.81	1.835E-03	}	7.251E-04		G
PB-214	7.5647E-04	351.99	7.535E-04	(	1.390E-04		G
		295.22	7.622E-04	(	2.211E-04		G
		77.11	2.236E-03	}	6.245E-04		Energy duplication
		241.92	7.565E-04	}	7.163E-04		G
BI-207	9.2669E-05	569.67	0.000E+00	}	3.665E-05		G
		1063.62	9.267E-05	&(	1.122E-04		G
		74.97	0.000E+00	}	1.964E-04		G
BI-212	8.0508E-04	727.17	7.685E-04	(	6.157E-04		G
		1620.56	1.832E-03	+	1.350E-03		G
		785.42	1.021E-03	&(	2.944E-03		G

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
BI-214	7.4312E-04	609.32	7.431E-04	(	1.202E-04	G
		1764.51	6.044E-04	-	3.362E-04	G
		1120.28	1.083E-03	+	4.640E-04	G
RA-224	1.5765E-03	241.00	1.577E-03	}(	1.984E-03	G
RA-226	0.0000E+00	185.99	0.000E+00	}	1.383E-03	G
AC-228	1.2672E-03	911.07	1.352E-03	@(	2.822E-04	G
		968.90	1.101E-03	(	5.421E-04	G
		338.40	1.304E-03	*(	4.830E-04	G
TH-227	2.6531E-04	236.00	2.126E-04	(	4.033E-04	G
		256.25	3.522E-04	&(	6.927E-04	G
TH-234	1.7838E-03	63.29	1.784E-03	(	2.425E-03	G
		92.80	3.027E-03	}	1.711E-03	G
		92.38	0.000E+00	}	2.478E-03	G
U-235	3.1465E-04	185.72	3.147E-04	}	9.832E-05	G
		143.76	1.276E-04	(	3.847E-04	G
		205.31	4.259E-04	(	1.020E-03	G
		163.35	6.213E-04	(	8.035E-04	G
NP-237	5.6558E-04	86.49	3.381E-04	}	4.405E-04	G
		95.87	5.656E-04	(	1.625E-03	G
AM-241	1.2865E-04	59.54	1.287E-04	(P	2.823E-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		1.1687E+01	1.1687E+01	1.6349E+00	1.7633E+00
CR-51	<	1.4970E-01	1.5269E-01		
MN-54	#A	2.2440E-02	2.2480E-02	4.1272E-02	4.1291E-02
MN-56	<	1.8004E-02	2.9594E+00		
FE-59	<	6.6453E-02	6.7265E-02		
CO-57	<	1.5616E-01	1.5647E-01		
CO-58	<	2.1555E-02	2.1723E-02		
CO-60	<	4.6814E-02	4.6827E-02		
Cm-243	A	9.6265E-02	9.6270E-02	8.3273E-02	8.3451E-02
ZN-65	A	3.7959E-02	3.8045E-02	7.4013E-02	7.4044E-02
Kr-85	<	6.7268E+02	6.7269E+02		
Y-88	<	2.1808E-02	2.1920E-02		
NB-94	A	1.3424E-02	1.3424E-02	2.1069E-02	2.1083E-02
Ag-108M	<	3.9490E-02	3.9490E-02		
AG-110M	<	2.4741E-02	2.4795E-02		
CD-109	<	9.4199E-01	9.4313E-01		
SN-113	<	3.8287E-02	3.8470E-02		
SB-125	<	6.6411E-02	6.6447E-02		
TE-131	C	5.7493E-02	>12 Halflives	7.4465E-02	7.4533E-02
TE-132		2.0178E-02	2.3886E-02	2.9917E-02	2.9948E-02
J-131	<	2.3429E-02	2.5080E-02		
CS-134	<	2.9394E-02	2.9416E-02		
CS-137		6.1574E-02	6.1577E-02	5.0729E-02	5.0849E-02
CE-139	A	1.3758E-02	1.3813E-02	2.6002E-02	2.6014E-02
CE-141	A	1.7921E-02	1.8226E-02	4.7638E-02	4.7649E-02
CE-144	#	2.8191E-01	2.8245E-01	4.0358E-01	4.0388E-01
EU-152	<	6.7504E-02	6.7512E-02		
EU-154	<	4.9941E-02	4.9949E-02		
EU-155	A	8.1384E-02	8.1408E-02	1.0168E-01	1.0178E-01
TA-182	A	6.7124E-02	6.7444E-02	1.0968E-01	1.0975E-01
HG-203	<	3.3043E-02	3.3434E-02		
TL-208		2.1567E-01	>12 Halflives	6.3635E-02	6.4791E-02
PB-212		6.6565E-01	2.2894E+00	3.1363E-01	3.3926E-01
PB-214		3.9359E-01	>12 Halflives	8.7526E-02	9.0307E-02
BI-207	#A	4.8215E-02	4.8217E-02	7.0296E-02	7.0349E-02

BI-212		4.1887E-01	>12 Halflives	3.4655E-01	3.4736E-01
BI-214		3.8664E-01	>12 Halflives	1.0434E-01	1.0661E-01
RA-224	#	8.2025E-01	9.5264E-01	8.9079E+02	7.1823E-01
AC-228		6.5930E-01	5.6266E+00	1.5387E+00	1.5712E+00
TH-227	A	1.3804E-01	1.4219E-01	2.3860E-01	2.3874E-01
TH-234	A	9.2807E-01	9.4940E-01	1.1949E+00	1.1960E+00
U-235	A	1.6371E-01	1.6371E-01	1.9809E-01	1.9830E-01
NP-237	A	2.9427E-01	2.9427E-01	7.6125E-01	7.6143E-01
AM-241	A	6.6938E-02	6.6938E-02	1.3329E-01	1.3334E-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) 1.6185263E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 2.2939266E+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_15DEC2004_1045.An1

Sample description
FSS-OOL-14-01-003-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\101F_15DEC2004_1045.An1

Acquisition information

Start time:	15-Dec-2004 10:46:34
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:	2.0880E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 2.0880E+03) = 4.7893E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	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	14-Dec-2004 14:40:00
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: 0.1421

********** 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	
167.79	84.13	343.	89.	0.044	94.08	1.012	TA-182	D
173.41	86.94	366.	160.	0.080	56.08	1.014	TB-160	D
179.71	90.09	321.	130.	0.065	64.22	1.016	PB-214	D
198.61	99.53	288.	46.	0.023	162.80	1.023	NP-239	D
226.10	113.75	346.	174.	0.087	84.69	0.983	YB-175	s
257.53	129.27	306.	87.	0.044	91.16	1.044	AC-228	D
418.42	209.37	140.	110.	0.055	74.19	0.818	AC-228	
540.60	270.44	135.	88.	0.044	102.16	1.323	AC-228	
600.10	300.18	95.	81.	0.041	94.50	1.641	PB-212	s
655.95	328.09	60.	54.	0.027	100.51	1.475	AC-228	s
819.90	410.03	65.	46.	0.023	136.18	0.701	AC-228	s
1589.20	794.25	24.	33.	0.017	80.76	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	281.	40.	0.020	184.97	0.994D
TH-234	126.14	63.29	227.	47.	0.023	143.43	0.996D
TA-182	135.50	67.97	186.	30.	0.015	242.49	1.000
HG-203	145.31	72.87	339.	0.	0.000	0.00	0.478D
PB-212	149.19	74.81	380.	304.	0.152	32.18	1.005D
BI-207	149.51	74.97	310.	0.	0.000	0.00	0.610D
PB-214	153.79	77.11	399.	370.	0.185	27.72	1.006D
PB-212	153.79	77.11	515.	0.	0.000	314.17	0.446D
CE-144	159.81	80.12	282.	0.	0.000	0.00	1.653D
EU-155	172.48	86.45	514.	0.	0.000	0.00	1.013D
NP-237	172.56	86.49	514.	0.	0.000	0.00	1.013D
CD-109	175.66	88.04	458.	45.	0.022	206.82	1.014D
TH-234	184.34	92.38	488.	0.	0.000	0.00	1.017D
TH-234	185.18	92.80	320.	144.	0.072	58.50	1.018D
NP-237	191.32	95.87	316.	18.	0.009	420.81	1.020D
Cm-243	198.69	99.55	210.	0.	0.000	0.00	1.113D
Cm-243	207.11	103.76	302.	0.	0.000	0.00	2.252D
EU-155	210.21	105.31	259.	51.	0.025	141.54	1.027D
TE-132	223.12	111.76	258.	0.	0.000	0.00	0.175D
TE-132	232.20	116.30	238.	0.	0.000	0.00	1.824D
Cm-243	233.60	117.00	267.	0.	0.000	0.00	0.496D
EU-152	243.16	121.78	292.	33.	0.016	227.90	1.039D
CO-57	243.74	122.07	326.	0.	0.000	0.00	1.039D
EU-154	245.80	123.10	258.	13.	0.006	538.77	1.039D
CE-144	266.67	133.53	282.	7.	0.004	1008.22	1.047D
CO-57	272.48	136.43	220.	34.	0.017	189.26	1.049D
U-235	287.14	143.76	279.	22.	0.011	324.78	1.054D
CE-141	290.52	145.45	298.	11.	0.006	652.89	1.055D
TE-131	299.07	149.72	322.	11.	0.006	675.69	1.058D
U-235	326.34	163.35	244.	29.	0.014	238.21	1.068D
CE-139	331.34	165.85	240.	34.	0.017	196.81	1.070D
SB-125	353.23	176.79	252.	32.	0.016	353.03	1.809s
U-235	371.10	185.72	318.	0.	0.000	0.00	1.084A
RA-226	371.64	185.99	200.	82.	0.041	80.36	1.259A
U-235	410.00	205.16	132.	0.	0.000	0.00	1.098
TE-132	453.57	226.94	162.	54.	0.027	170.78	2.443s
TH-227	471.70	236.00	135.	28.	0.014	184.71	1.120D
PB-212	476.96	238.63	159.	842.	0.421	12.14	1.122D
RA-224	481.70	241.00	188.	110.	0.055	60.26	1.800A
PB-214	483.54	241.92	257.	61.	0.031	11.82	1.124A
SN-113	509.79	255.04	78.	16.	0.008	244.07	1.133D
TH-227	512.21	256.25	111.	14.	0.007	320.21	1.134D
Cm-243	554.93	277.60	102.	47.	0.023	101.14	1.149D
HG-203	558.07	279.17	141.	22.	0.011	190.66	1.150D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
J-131	567.00	283.63	43.	5.	0.002	563.70	0.000s
PB-214	590.21	295.23	106.	134.	0.067	44.93	1.231
CR-51	639.75	319.99	32.	8.	0.004	382.43	0.625s
AC-228	676.41	338.31	82.	172.	0.086	35.05	1.173
EU-152	687.59	343.90	35.	35.	0.018	118.92	1.186s
PB-214	703.89	352.05	94.	214.	0.107	30.62	1.170
J-131	729.00	364.60	33.	3.	0.001	898.44	0.000s
SN-113	781.00	390.58	53.	5.	0.002	564.21	0.000s
SB-125	856.67	428.40	27.	9.	0.005	268.49	0.482s
Ag-108M	865.50	432.82	45.	23.	0.012	155.98	0.859s
TE-131	902.00	451.06	41.	8.	0.004	361.12	0.179s
SB-125	925.52	462.81	64.	46.	0.023	94.81	1.548s
TE-131	985.00	492.54	20.	1.	0.001	1841.20	0.500s
TL-208	1021.38	510.72	40.	86.	0.043	45.01	1.311D
Kr-85	1027.92	513.99	59.	5.	0.003	650.46	1.313D
CS-134	1138.58	569.29	21.	0.	0.000	0.00	0.444D
BI-207	1138.14	569.07	21.	11.	0.005	205.00	0.444s
TL-208	1166.39	583.19	34.	260.	0.130	21.50	1.275
SB-125	1201.57	600.77	31.	9.	0.005	267.33	1.372D
CS-134	1209.35	604.66	43.	9.	0.005	307.64	1.374D
BI-214	1218.68	609.32	26.	176.	0.088	25.76	1.378D
Ag-108M	1228.78	614.37	16.	0.	0.000	0.00	0.774D
SB-125	1271.50	635.72	5.	0.	0.000	0.00	0.583s
J-131	1274.00	636.97	16.	0.	0.000	0.00	0.898D
AG-110M	1315.58	657.75	27.	1.	0.000	3934.52	1.410D
CS-137	1323.33	661.62	32.	29.	0.014	100.35	1.413D
NB-94	1406.00	702.94	10.	0.	0.000	1209.34	0.000s
Ag-108M	1446.05	722.95	37.	1.	0.000	3373.61	1.454D
EU-154	1446.75	723.30	37.	0.	0.000	0.00	1.454D
BI-212	1454.49	727.17	37.	42.	0.021	76.62	1.457D
EU-152	1558.00	778.90	7.	0.	0.000	0.00	0.000s
BI-212	1570.59	785.19	37.	11.	0.006	284.14	0.788s
CS-134	1591.75	795.76	52.	6.	0.003	545.75	1.503D
CS-134	1603.91	801.84	31.	5.	0.003	456.58	1.507D
CO-58	1622.39	811.07	16.	12.	0.006	189.47	1.036
MN-54	1671.38	835.55	26.	24.	0.012	128.90	0.999s
MN-56	1691.08	845.40	9.	4.	0.002	351.78	1.233
NB-94	1747.00	873.35	17.	9.	0.004	242.58	0.000s
AG-110M	1769.00	884.34	2.	0.	0.000	0.00	0.000s
Y-88	1796.00	897.83	11.	3.	0.002	367.42	0.777s
AC-228	1822.23	910.94	24.	173.	0.086	28.02	1.704s
AG-110M	1877.94	938.78	18.	12.	0.006	205.09	0.817s
EU-152	1928.41	964.00	23.	29.	0.014	89.85	1.612D
AC-228	1938.21	968.90	25.	108.	0.054	34.83	1.616D
EU-154	2008.83	1004.19	16.	7.	0.003	291.83	0.944s
BI-207	2126.38	1062.93	5.	7.	0.004	176.70	0.538s
FE-59	2199.07	1099.25	8.	5.	0.002	287.09	0.462s
EU-152	2224.72	1112.07	35.	4.	0.002	666.94	1.707D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
ZN-65	2231.62	1115.52	33.	5.	0.003	458.01	1.709D
BI-214	2241.15	1120.28	28.	38.	0.019	75.58	1.712D
TA-182	2243.15	1121.28	56.	0.	0.000	0.00	1.713D
TE-131	2292.95	1146.16	13.	13.	0.007	160.35	0.975s
CO-60	2343.81	1171.58	36.	10.	0.005	200.62	0.406s
TA-182	2376.00	1187.66	12.	4.	0.002	349.07	0.200s
TA-182	2444.00	1221.64	5.	0.	0.000	0.00	0.000s
EU-154	2550.00	1274.61	4.	0.	0.000	0.00	0.000s
FE-59	2583.50	1291.35	2.	0.	0.000	0.00	0.583s
CO-60	2665.15	1332.15	16.	9.	0.004	134.16	0.570s
AG-110M	2767.59	1383.34	3.	16.	0.008	102.08	1.916s
EU-152	2817.70	1408.38	2.	13.	0.007	97.63	0.991s
K-40	2921.98	1460.48	7.	600.	0.300	12.56	1.813
BI-212	3238.33	1618.55	3.	16.	0.008	99.22	0.475s
BI-214	3530.94	1764.75	0.	17.	0.009	72.76	1.207s
MN-56	3625.00	1811.75	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		2.5753E-02	1460.75	2.575E-02	(	6.455E-04	G
CR-51		0.0000E+00	320.07	0.000E+00	%	3.338E-04	G
MN-54		6.7508E-05	834.81	6.751E-05	*(	7.446E-05	G
MN-56		0.0000E+00	846.60	0.000E+00	&	4.801E-05	G
			1811.20	0.000E+00	%	1.512E-04	G
FE-59		2.9586E-05	1099.22	2.959E-05	?(	1.025E-04	G
			1291.56	0.000E+00	?	8.874E-05	G
CO-57		2.0994E-04	122.07	0.000E+00	} P	6.486E-05	G
			136.43	2.099E-04	$(	4.367E-04	G
CO-58		3.1679E-05	810.75	3.168E-05	(	5.961E-05	G
CO-60		3.6125E-05	1332.51	3.613E-05	?(P	9.161E-05	G
			1173.23	0.000E+00	& P	1.168E-04	G

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
Cm-243	3.3263E-04	277.60	3.326E-04	(	3.523E-04	G
		117.00	0.000E+00	}	4.669E-04	G
		103.76	0.000E+00	&	2.374E-04	G
		99.55	0.000E+00	!	3.246E-04	G
ZN-65	0.0000E+00	1115.52	0.000E+00	%	2.093E-04	G
Kr-85	0.0000E+00	513.99	0.000E+00	%	1.603E+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
NB-94	2.5314E-05	871.10	2.531E-05	&(	6.458E-05	G
		702.50	0.000E+00	%	4.284E-05	G
Ag-108M	0.0000E+00	722.95	0.000E+00	}	8.499E-05	G
		614.37	0.000E+00	&	5.016E-05	G
		433.93	3.886E-05	&	5.740E-05	G
AG-110M	0.0000E+00	657.75	0.000E+00	%	6.479E-05	G
		884.67	0.000E+00	?	3.780E-05	G
		937.48	1.060E-04	&	2.059E-04	G
		1384.27	2.848E-04	*	1.979E-04	G
CD-109	8.2974E-04	88.04	8.297E-04	(	1.890E-03	G
SN-113	0.0000E+00	391.71	0.000E+00	& P	7.854E-05	G
		255.04	7.142E-04		1.943E-03	G
SB-125	1.8456E-04	427.95	4.639E-05	?(	1.359E-04	G
		600.77	1.065E-04	(	3.218E-04	G
		636.15	0.000E+00	}	2.572E-04	G
		463.51	7.371E-04	&(	6.502E-04	G
		176.29	0.000E+00	%	8.593E-04	G
TE-131	0.0000E+00	149.72	0.000E+00	%	8.261E-05	G
		452.32	0.000E+00	&	2.820E-04	G
		1146.96	9.865E-04		1.454E-03	G
		492.66	0.000E+00	%	8.371E-04	G
TE-132	5.1079E-05	228.16	5.108E-05	&(	5.867E-05	G
		116.30	0.000E+00	}	2.448E-03	G
		111.76	0.000E+00	&	2.694E-03	G
J-131	0.0000E+00	364.48	0.000E+00	%	4.665E-05	G
		636.97	0.000E+00	}	6.453E-04	G
		284.29	0.000E+00	&	5.567E-04	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-134	0.0000E+00	604.66	0.000E+00	%	7.094E-05		G
		795.76	0.000E+00	%	1.148E-04		G
		569.29	0.000E+00	}	3.082E-04		G
		801.84	0.000E+00	%	8.856E-04		G
CS-137	7.7603E-05	661.62	7.760E-05	(	7.835E-05		G
CE-139	2.9476E-05	165.85	2.948E-05	(P	6.413E-05		G
CE-141	0.0000E+00	145.45	0.000E+00	%	1.133E-04		G
CE-144	0.0000E+00	133.53	0.000E+00	%	4.820E-04		G
		80.12	0.000E+00	!	3.812E-03		G
EU-152	3.0788E-04	121.78	7.147E-05	}	1.800E-04		G
		344.30	1.569E-04	(	1.358E-04		G
		1408.08	2.760E-04	?(	1.891E-04		G
		964.00	6.337E-04	(	5.497E-04		G
		1112.07	0.000E+00	%	8.081E-04		G
		778.90	0.000E+00	?	3.059E-04		G
EU-154	0.0000E+00	123.10	0.000E+00	%	1.225E-04		G
		1274.80	0.000E+00	?	1.381E-04		G
		723.30	0.000E+00	}	3.895E-04		G
		1004.80	1.255E-04	?	4.054E-04		G
EU-155	1.5073E-04	86.45	0.000E+00	}	2.342E-04		G
		105.31	1.507E-04	(	2.318E-04		G
TA-182	7.1451E-05	67.75	7.145E-05	?(	1.578E-04		G
		1121.28	0.000E+00	%	3.913E-04		G
		1221.42	0.000E+00	?	1.881E-04		G
		1189.05	0.000E+00	&	4.473E-04		G
HG-203	2.6942E-05	279.17	2.694E-05	(P	7.074E-05		G
		72.87	0.000E+00	?	1.176E-03		G
TL-208	6.2447E-04	583.14	6.100E-04	(	7.071E-05		G
		510.72	6.797E-04	(	2.549E-04		G
PB-212	1.6943E-03	238.63	1.694E-03	(	1.239E-04		G
		77.11	0.000E+00	}	4.868E-04		Energy duplication
		74.81	2.588E-03	}	7.961E-04		G
PB-214	7.1929E-04	351.99	7.152E-04	(	1.593E-04		G
		295.22	7.272E-04	(	2.767E-04		G
		77.11	2.715E-03	}	7.033E-04		Energy duplication

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		241.92	7.193E-04	}		9.089E-04	G
BI-207	3.1643E-05	569.67	2.219E-05	}		4.855E-05	G
		1063.62	3.164E-05	?(		5.935E-05	G
		74.97	0.000E+00	}		1.789E-04	G
BI-212	9.7536E-04	727.17	8.850E-04	(		6.507E-04	G
		1620.56	2.932E-03	&		1.976E-03	G
		785.42	1.509E-03	?(		4.117E-03	G
BI-214	8.3567E-04	609.32	8.049E-04	(		1.216E-04	G
		1764.51	5.815E-04	-		2.521E-04	G
		1120.28	9.299E-04	(		6.584E-04	G
RA-224	2.4609E-03	241.00	2.461E-03	}(		2.303E-03	G
RA-226	1.8170E-03	185.99	1.817E-03	}(		1.698E-03	G
AC-228	1.8450E-03	911.07	1.813E-03	@(		2.676E-04	G
		968.90	1.991E-03	(		4.774E-04	G
		338.40	1.710E-03	(		4.465E-04	G
TH-227	2.1525E-04	236.00	2.153E-04	(		4.365E-04	G
		256.25	0.000E+00	%		7.006E-04	G
TH-234	1.4494E-03	63.29	1.449E-03	(		2.258E-03	G
		92.80	3.252E-03	}		1.950E-03	G
		92.38	0.000E+00	}		2.799E-03	G
U-235	0.0000E+00	185.72	0.000E+00	}		1.154E-04	G
		143.76	0.000E+00	%		5.002E-04	G
		205.31	0.000E+00	%		9.268E-04	G
		163.35	4.150E-04			1.095E-03	G
NP-237	0.0000E+00	86.49	0.000E+00	}		5.852E-04	G
		95.87	0.000E+00	%		1.934E-03	G
AM-241	1.7227E-04	59.54	1.723E-04	(P		3.524E-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	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
K-40		1.2334E+01	1.2334E+01	1.5497E+00	1.6992E+00
CR-51	<	1.5986E-01	1.6325E-01		
MN-54	#A	3.2331E-02	3.2392E-02	4.1752E-02	4.1792E-02
MN-56	<	2.2992E-02	5.1470E+00		
FE-59	#A	1.4169E-02	1.4353E-02	4.1207E-02	4.1215E-02
CO-57	A	1.0055E-01	1.0076E-01	1.9071E-01	1.9079E-01
CO-58	A	1.5172E-02	1.5297E-02	2.8983E-02	2.8996E-02
CO-60	#A	1.7301E-02	1.7307E-02	4.0847E-02	4.0859E-02
Cm-243	A	1.5931E-01	1.5932E-01	1.6114E-01	1.6139E-01
ZN-65	<	1.0024E-01	1.0048E-01		
Kr-85	<	7.6754E+02	7.6755E+02		
Y-88	<	2.0074E-02	2.0183E-02		
NB-94	#A	1.2123E-02	1.2123E-02	2.9409E-02	2.9417E-02
Ag-108M	<	2.4023E-02	2.4024E-02		
AG-110M	<	3.1030E-02	3.1102E-02		
CD-109	A	3.9738E-01	3.9789E-01	8.2291E-01	8.2321E-01
SN-113	<	3.7616E-02	3.7807E-02		
SB-125	C	8.8392E-02	8.8443E-02	8.3848E-02	8.3997E-02
TE-131	<	3.96E-02	>12 Halflives		
TE-132	#A	2.4463E-02	2.9256E-02	4.9964E-02	4.9992E-02
J-131	<	2.2342E-02	2.4016E-02		
CS-134	<	3.3977E-02	3.4003E-02		
CS-137	A	3.7166E-02	3.7168E-02	3.7299E-02	3.7358E-02
CE-139	A	1.4117E-02	1.4177E-02	2.8014E-02	2.8026E-02
CE-141	<	5.4252E-02	5.5234E-02		

CE-144	<	2.3083E-01	2.3131E-01

EU-152	C	1.4745E-01	1.4747E-01	8.7586E-02	8.7982E-02
EU-154	<	5.8686E-02	5.8697E-02		
EU-155	A	7.2191E-02	7.2214E-02	1.0221E-01	1.0229E-01
TA-182	A	3.4220E-02	3.4393E-02	8.3398E-02	8.3420E-02
HG-203	A	1.2903E-02	1.3065E-02	3.0659E-02	3.0668E-02
TL-208		2.9908E-01	>12 Halflives	6.4290E-02	6.6474E-02
PB-212		8.1143E-01	3.0074E+00	3.6516E-01	4.0277E-01
PB-214		3.4449E-01	>12 Halflives	9.3655E-02	9.5657E-02
BI-207	#A	1.5155E-02	1.5155E-02	2.6780E-02	2.6794E-02
BI-212		4.6713E-01	>12 Halflives	3.5791E-01	3.5888E-01
BI-214		4.0023E-01	>12 Halflives	1.0311E-01	1.0556E-01
RA-224	#	1.1786E+00	1.3813E+00	1.0357E+03	8.3600E-01
RA-226	#	8.7021E-01	8.7021E-01	9.0099E+02	7.0105E-01
AC-228		8.8361E-01	8.5859E+00	1.6257E+00	1.6965E+00
TH-227	A	1.0309E-01	1.0638E-01	1.9649E-01	1.9658E-01
TH-234	A	6.9417E-01	7.1111E-01	1.0200E+00	1.0207E+00
U-235	<	2.3954E-01	2.3954E-01		
NP-237	<	9.2640E-01	9.2640E-01		
AM-241	A	8.2503E-02	8.2503E-02	1.5360E-01	1.5367E-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) 1.8151739E+01 pCi/gm
Total Decayed Activity (50.2 to 2023.1 keV) 2.8279337E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

Yankee Chemistry Spectrum name: 101F_22APR2005_1028.An1

Sample description
FSS-OOL-015-01-018-P-Q

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_22APR2005_1028.An1

Acquisition information

Start time:	22-Apr-2005 10:28:42
Live time:	2000
Real time:	2003
Dead time:	0.17 %
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:	1.8680E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.8680E+03) = 5.3533E+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_22APR2005_1028.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	21-Apr-2005 11:45:00
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: 0.1776

***** 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
74.35	140.	25.80	1.00	1.651E-02				
74.35	140.	25.80	1.00	1.651E-02	74.81	9.600	6.382E-01	PB212
77.35	367.	9.53	1.01	1.736E-02	77.11	10.700	1.443E+00	PB214
					77.11	17.500	8.820E-01	PB212
84.45	78.	36.35	1.01	1.877E-02				
86.77	109.	29.64	1.01	1.913E-02				
89.96	111.	26.02	1.02	1.957E-02	88.04	3.790	1.096E+00	CD109
93.22	109.	26.88	1.02	1.993E-02	92.38	2.570	1.541E+00	TH234
					92.80	3.000	1.317E+00	TH234
					98.44	25.100	1.536E-01	PA234
186.20	118.	29.07	0.99	1.857E-02	185.99	3.280	1.401E+00	RA226
209.30	78.	35.60	1.30	1.721E-02				
238.81	886.	3.99	1.12	1.557E-02	238.63	43.100	9.544E-01	PB212
241.79	108.	23.40	1.12	1.541E-02	241.00	3.900	1.292E+00	RA224
270.92	68.	33.19	1.52	1.397E-02				
295.43	164.	11.66	1.16	1.291E-02	295.22	19.200	4.794E-01	PB214
299.97	47.	36.68	1.16	1.273E-02				
328.30	72.	32.25	1.08	1.169E-02				
338.66	203.	12.40	1.21	1.134E-02	338.40	12.010	1.078E+00	AC228
352.01	272.	8.60	1.34	1.092E-02	351.99	37.100	4.858E-01	PB214
462.37	77.	27.37	1.65	8.362E-03				
462.37	77.	27.37	1.65	8.362E-03	463.51	10.000	6.682E-01	SB125
511.02	125.	13.72	1.35	7.586E-03	510.72	22.500	5.312E-01	TL208
583.33	277.	8.65	1.30	6.682E-03	583.14	86.000	3.481E-01	TL208
609.31	219.	11.44	1.53	6.413E-03	609.32	46.090	5.368E-01	BI214
727.92	68.	21.37	1.46	5.438E-03	727.17	11.800	7.614E-01	BI212

860.29	63.	23.72	1.27	4.678E-03				
911.00	180.	8.80	1.55	4.447E-03	911.07	29.000	1.009E+00	AC228
968.26	143.	15.45	1.20	4.215E-03	968.90	17.460	1.411E+00	AC228
1119.88	60.	24.10	1.80	3.711E-03	1120.28	15.040	7.751E-01	BI214
1237.64	45.	34.98	1.42	3.403E-03				
1460.64	684.	3.96	1.87	2.943E-03	1460.75	10.700	1.572E+01	K40
1764.52	15.	37.92	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	
148.26	74.72	583.	140.	0.070	77.39	1.004	BI-207	D
154.26	77.72	429.	367.	0.184	28.60	1.007	PB-214	D
173.12	86.71	467.	109.	0.054	88.91	1.013	BI-207	lD
179.50	89.90	360.	111.	0.055	78.06	1.016	PB-214	lD
418.28	209.30	317.	78.	0.039	106.81	1.296	AC-228	
477.32	238.71	180.	886.	0.443	11.96	1.122	PB-212	D
483.28	241.69	263.	108.	0.054	70.21	1.124	PB-214	D
541.56	270.92	194.	68.	0.034	99.56	1.524	AC-228	s
599.76	300.00	144.	62.	0.031	92.53	1.051	PB-212	s
656.37	328.30	181.	72.	0.036	96.76	1.079	RH-106M	s
1720.87	860.29	44.	63.	0.031	71.16	1.270	TL-208	s
2476.02	1237.64	65.	45.	0.022	104.95	1.421	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
PB-212	149.46	74.95	1156.	203.	0.101	74.18	1.499
PB-214	153.79	77.11	1039.	318.	0.159	46.18	1.499D
PB-212	153.79	77.11	1039.	318.	0.159	46.18	1.499D
TH-234	186.01	93.21	1021.	114.	0.057	122.41	1.499s
RA-226	372.05	186.20	441.	118.	0.059	87.20	0.985
PB-212	477.26	238.78	468.	737.	0.368	16.66	1.499
PB-214	590.64	295.45	200.	167.	0.083	42.79	1.499
AC-228	677.10	338.66	160.	203.	0.102	37.19	1.211s
PB-214	703.86	352.03	126.	275.	0.138	25.04	1.499
SB-125	925.65	462.88	77.	41.	0.021	101.99	1.499s
TL-208	1021.98	511.02	66.	125.	0.063	41.16	1.351s
TL-208	1166.68	583.33	92.	277.	0.138	25.95	1.299
BI-214	1218.65	609.31	111.	219.	0.110	34.31	1.530s
BI-212	1456.00	727.92	50.	68.	0.034	64.11	1.460s
AC-228	1822.35	911.00	25.	180.	0.090	26.40	1.550
AC-228	1936.93	968.26	76.	143.	0.072	46.36	1.204
BI-214	2240.36	1119.88	46.	60.	0.030	72.29	1.799
K-40	2922.29	1460.64	11.	684.	0.342	11.88	1.866

Yankee Chemistry Spectrum name: 101F_22APR2005_1028.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3530.47	1764.52	9.	15.	0.008	113.75	2.106

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

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

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	Peak COMMENTS
BE-7		4.3445E-02					
			477.56	4.344E-02	%(	3.739E-01 1.08E-01	G
K-40		1.5721E+01					
			1460.75	1.572E+01	(	4.141E-01 6.22E-01	G
MN-54		3.2349E-02					
			834.81	3.235E-02	%(	4.773E-02 1.50E-02	G
CO-57		-1.0298E-02					
			122.07	-1.030E-02	%(P	5.175E-02 1.55E-02	G K
			136.43	-7.637E-03	%	3.181E-01 9.40E-02	G
CO-60		7.4084E-03					
			1332.51	7.408E-03	%(P	6.339E-02 1.69E-02	G K
			1173.23	1.393E-02	% P	7.666E-02 2.16E-02	G K
Sr-85		-1.0100E-02					
			514.00	-1.010E-02	%(	5.684E-02 1.67E-02	G
Kr-85		-2.3079E+02					
			513.99	-2.308E+02	%(	1.299E+03 3.83E+02	G
Y-88		-5.1503E-03					
			1836.01	-5.150E-03	%(P	4.784E-02 1.24E-02	G K
			898.02	-1.179E-02	% P	5.529E-02 1.58E-02	G
NB-94		-2.6280E-04					
			871.10	-2.628E-04	%(	3.227E-02 8.53E-03	G K
			702.50	2.892E-03	&	5.184E-02 1.48E-02	G K
Ag-108M		3.6304E-03					
			722.95	3.630E-03	%(	4.802E-02 1.36E-02	G K
			614.37	-1.721E-02	%	5.538E-02 1.64E-02	G
			433.93	-9.048E-03	%	5.016E-02 1.48E-02	G

Yankee Chemistry Spectrum name: 101F_22APR2005_1028.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	3.1670E-01						
		88.04	3.167E-01	%(	1.460E+00	4.39E-01	G
SN-113	-1.6267E-02						
		391.71	-1.627E-02	&(P	7.089E-02	2.09E-02	G K
		255.04	-3.309E-01	%	1.942E+00	5.77E-01	G
SB-125	9.2163E-02						
		427.95	3.047E-03	&(	1.453E-01	4.20E-02	G K
		600.77	7.528E-03	%	2.668E-01	7.63E-02	G
		636.15	-5.596E-03	&	4.027E-01	1.14E-01	G
		463.51	3.559E-01	*(	3.777E-01	1.21E-01	G
		176.29	1.114E-01	&	6.678E-01	1.99E-01	G
I-131	7.0766E-03						
		364.48	7.077E-03	&(	5.252E-02	1.54E-02	G K
		636.97	0.000E+00	%	7.553E-01	2.15E-01	G
		284.29	-7.681E-03	&	5.081E-01	1.46E-01	G
CS-134	-1.2226E-03						
		604.66	-1.223E-03	%(	1.033E-01	3.04E-02	G K
		795.76	3.221E-02	%	5.467E-02	1.69E-02	G
		569.29	1.573E-03	&	3.041E-01	8.67E-02	G
		801.84	1.146E-02	%	4.963E-01	1.38E-01	G
CS-137	1.6470E-02						
		661.62	1.647E-02	%(	5.257E-02	1.56E-02	G
CE-139	2.0738E-02						
		165.85	2.074E-02	&(P	4.653E-02	1.41E-02	G
EU-152	-2.7889E-03						
		121.78	-2.789E-03	&(	1.171E-01	3.46E-02	G K
		344.30	4.564E-03	&	1.395E-01	4.05E-02	G
		1408.08	9.762E-04	&	2.330E-01	6.16E-02	G
		964.00	2.352E-01	%	5.183E-01	1.57E-01	G
		1112.07	1.441E-02	%	4.485E-01	1.25E-01	G
		778.90	2.273E-03	%	3.557E-01	9.91E-02	G
EU-154	-1.3185E-02						
		123.10	-1.318E-02	%(	1.127E-01	3.37E-02	G K
		1274.80	-1.482E-02	&	1.998E-01	5.64E-02	G
		723.30	3.920E-02	%	2.043E-01	5.88E-02	G
		1004.80	-2.888E-04	&	3.428E-01	9.58E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	3.9747E-03						
		86.45	3.975E-03	%(	1.537E-01	4.57E-02	G K
		105.31	9.439E-02	&	2.118E-01	6.41E-02	G
HG-203	1.8758E-02						
		279.17	1.876E-02	%(P	4.490E-02	1.35E-02	G K
		72.87	-3.094E-01	%	1.205E+00	3.63E-01	G
		70.83	-3.845E-01	&	2.115E+00	6.35E-01	G
		82.50	-8.554E-01	%	2.715E+00	8.19E-01	G
TL-208	3.4808E-01						
		583.14	3.481E-01	(	5.978E-02	3.01E-02	G
		510.72	5.312E-01	+	1.714E-01	7.29E-02	G
PB-212	8.0428E-01						
		238.63	7.940E-01	(	1.116E-01	4.41E-02	G K
							Energy duplication
		77.11	7.640E-01	(	3.674E-01	1.18E-01	G
		74.81	9.240E-01	&(	7.342E-01	2.28E-01	G
PB-214	4.8958E-01						
		351.99	4.910E-01	(	9.826E-02	4.10E-02	G K
		295.22	4.868E-01	(	2.001E-01	6.94E-02	G
							Energy duplication
		77.11	1.250E+00	+	6.009E-01	1.92E-01	G
		241.92	5.704E-02	%	6.197E-01	1.84E-01	G
BI-212	7.6142E-01						
		727.17	7.614E-01	*(	4.032E-01	1.63E-01	G K
		1620.56	1.545E-01	%	1.857E+00	4.98E-01	G
		785.42	0.000E+00	%	2.296E+00	6.38E-01	G
BI-214	5.3677E-01						
		609.32	5.368E-01	*(	1.266E-01	6.14E-02	G K
		1764.51	2.812E-01	-	3.094E-01	1.07E-01	G
		1120.28	7.751E-01	+	4.457E-01	1.87E-01	G
RA-224	9.7693E-01						
		241.00	9.769E-01	%(	1.407E+00	4.31E-01	G
RA-226	1.4005E+00						
		185.99	1.401E+00	(	1.194E+00	4.07E-01	G
AC-228	1.0291E+00						
		911.07	1.009E+00	(	1.464E-01	8.88E-02	G K
		968.90	1.411E+00	+	4.252E-01	2.18E-01	G
		338.40	1.078E+00	@(	3.270E-01	1.34E-01	G

Yankee Chemistry Spectrum name: 101F_22APR2005_1028.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-2.2952E-01						
		236.00	-2.295E-01	%(	5.360E-01	1.62E-01	G K
		256.25	8.230E-02	%	5.958E-01	1.77E-01	G
PA-234	1.8850E-02						
		98.44	1.885E-02	%(	1.525E-01	4.54E-02	G K
		946.00	-4.152E-02	%	3.253E-01	9.37E-02	G
		131.28	4.761E-02	&	2.304E-01	6.91E-02	G
		94.67	2.474E-03	&	3.503E-01	1.04E-01	G
		883.24	-1.095E-01	%	4.504E-01	1.31E-01	G
		926.70	7.420E-02	&	4.702E-01	1.35E-01	G
		569.26	3.754E-03	&	4.504E-01	1.28E-01	G
TH-234	1.2095E+00						
		63.29	1.079E+00	%(	2.307E+00	6.99E-01	G K
		92.80	1.380E+00	*(	1.838E+00	5.63E-01	G
		92.38	-2.264E-01	%	2.209E+00	6.61E-01	G
AM-241	-2.0486E-03						
		59.54	-2.049E-03	&(P	3.368E-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	4.2914E-02	4.3445E-02	3.2406E-01	3.2407E-01	3.693E-01
K-40		1.5721E+01	1.5721E+01	1.8674E+00	2.0679E+00	
MN-54	#A	3.2281E-02	3.2349E-02	4.4919E-02	4.4956E-02	4.763E-02
CO-57	#B	-1.0273E-02	-1.0298E-02	5.1494E-02	5.1497E-02	5.162E-02
CO-60	#B	7.4059E-03	7.4084E-03	5.0665E-02	5.0667E-02	6.336E-02
Sr-85	#A	-9.9980E-03	-1.0100E-02	5.0233E-02	5.0236E-02	5.627E-02
Kr-85	#A	-2.3078E+02	-2.3079E+02	1.1480E+03	1.1480E+03	1.299E+03
Y-88	#B	-5.1187E-03	-5.1503E-03	4.9835E-02	4.9836E-02	4.754E-02
NB-94	#B	-2.6280E-04	-2.6280E-04	2.5594E-02	2.5594E-02	3.227E-02
Ag-108M	#B	3.6303E-03	3.6304E-03	4.0703E-02	4.0704E-02	4.802E-02
CD-109	#A	3.1624E-01	3.1670E-01	1.3156E+00	1.3157E+00	1.458E+00
SN-113	#B	-1.6175E-02	-1.6267E-02	7.4362E-02	7.4368E-02	7.049E-02
SB-125	#B	9.2103E-02	9.2163E-02	9.3998E-02	9.4142E-02	1.452E-01
I-131	#B	6.5218E-03	7.0766E-03	4.6190E-02	4.6192E-02	4.840E-02
CS-134	#B	-1.2215E-03	-1.2226E-03	9.1326E-02	9.1326E-02	1.033E-01
CS-137	#A	1.6469E-02	1.6470E-02	4.6659E-02	4.6669E-02	5.257E-02
CE-139	#A	2.0639E-02	2.0738E-02	4.2254E-02	4.2270E-02	4.631E-02
EU-152	#B	-2.7885E-03	-2.7889E-03	1.0385E-01	1.0385E-01	1.171E-01
EU-154	#B	-1.3182E-02	-1.3185E-02	1.0102E-01	1.0102E-01	1.127E-01
EU-155	#B	3.9732E-03	3.9747E-03	1.3724E-01	1.3724E-01	1.537E-01
HG-203	#B	1.8496E-02	1.8758E-02	4.0393E-02	4.0407E-02	4.427E-02
TL-208		3.4808E-01	3.4808E-01	9.0313E-02	9.2430E-02	
PB-212	#	8.0428E-01	8.0428E-01	1.3396E-01	1.4146E-01	1.116E-01
PB-214	#	4.8958E-01	4.8958E-01	1.2136E-01	1.2447E-01	9.826E-02
BI-212	#	7.6142E-01	7.6142E-01	4.8818E-01	4.9007E-01	
BI-214		5.3677E-01	5.3677E-01	1.8414E-01	1.8662E-01	
RA-224	#A	9.7693E-01	9.7693E-01	1.2931E+00	1.2942E+00	1.407E+00
RA-226		1.4005E+00	1.4005E+00	1.2213E+00	1.2238E+00	
AC-228		1.0291E+00	1.0291E+00	2.3470E-01	2.4179E-01	
TH-227	#B	-2.2952E-01	-2.2952E-01	4.8663E-01	4.8680E-01	5.360E-01
PA-234	#B	1.8850E-02	1.8850E-02	1.3625E-01	1.3625E-01	1.525E-01
TH-234	#B	1.2095E+00	1.2095E+00	1.3899E+00	1.3915E+00	2.307E+00
AM-241	#A	-2.0486E-03	-2.0486E-03	5.5247E-01	5.5247E-01	3.368E-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_22APR2005_1028.An1

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

Total Activity (270.6 to 1999.1 keV) 1.9796902E+01 pCi/gm
Total Decayed Activity (270.6 to 1999.1 keV) 1.9796904E+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_22APR2005_1104.An1

Sample description
FSS-OOL-14-01-025-P-Q

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_22APR2005_1104.An1

Acquisition information
Start time: 22-Apr-2005 11:04:55
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: 1.7690E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7690E+03) =
5.6529E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

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

Yankee Chemistry Spectrum name: 101F_22APR2005_1104.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	21-Apr-2005 10:55:00
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: 0.1754

***** 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	178.	24.85	1.50	1.654E-02	70.83	3.520	2.596E+00	HG203
					74.81	9.600	8.573E-01	PB212
77.20	250.	17.19	1.50	1.720E-02	77.11	10.700	1.038E+00	PB214
					77.11	17.500	6.348E-01	PB212
77.20	250.	17.19	1.50	1.720E-02	77.11	10.700	1.038E+00	PB214
					77.11	17.500	6.348E-01	PB212
92.96	93.	40.73	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.191E+00	TH234
92.97	93.	41.22	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.189E+00	TH234
128.99	81.	30.12	1.07	2.110E-02				
186.33	134.	21.81	1.50	1.856E-02	185.99	3.280	1.679E+00	RA226
209.30	66.	36.28	0.93	1.721E-02				
238.81	535.	5.23	1.12	1.557E-02	238.63	43.100	6.083E-01	PB212
238.82	218.	15.11	1.50	1.540E-02	238.63	43.100	PBC<MDA	PB212
241.58	101.	21.07	1.12	1.542E-02	241.00	3.900	1.286E+00	RA224
295.35	148.	16.25	1.08	1.292E-02	295.22	19.200	4.564E-01	PB214
338.39	113.	22.10	1.35	1.135E-02				
338.39	113.	22.10	1.35	1.135E-02	338.40	12.010	6.310E-01	AC228
351.98	223.	11.62	1.32	1.092E-02				
351.98	223.	11.62	1.32	1.092E-02	351.99	37.100	4.205E-01	PB214
462.82	31.	35.81	1.50	8.342E-03	463.51	10.000	PBC<MDA	SB125
510.69	92.	18.37	1.91	7.591E-03	510.72	22.500	4.097E-01	TL208
583.30	175.	11.02	1.35	6.683E-03	583.14	86.000	2.328E-01	TL208
609.53	134.	12.06	1.09	6.411E-03	609.32	46.090	3.474E-01	BI214
661.77	23.	40.95	1.50	5.937E-03	661.62	84.620	PBC<MDA	CS137

911.27	95.	14.89	1.85	4.446E-03	911.07	29.000	5.640E-01	AC228
968.20	86.	18.36	1.64	4.215E-03				
968.20	86.	18.36	1.64	4.215E-03	968.90	17.460	8.933E-01	AC228
1119.81	53.	29.24	0.90	3.712E-03	1120.28	15.040	7.254E-01	BI214

Yankee Chemistry Spectrum name: 101F_22APR2005_1104.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1460.60	534.	4.43	1.87	2.943E-03	1460.75	10.700	1.295E+01	K40
1764.28	28.	18.90	2.79	2.481E-03	1764.51	15.920	5.415E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.28	209.30	229.	66.	0.033	108.85	0.928	AC-228	
477.31	238.71	123.	535.	0.267	15.69	1.122	PB-212	D
482.86	241.49	178.	101.	0.051	63.22	1.124	PB-214	D

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

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.16	74.79	891.	178.	0.089	74.54	1.499
PB-214	153.79	77.11	800.	250.	0.125	51.57	1.499D
PB-212	153.79	77.11	800.	250.	0.125	51.57	1.499D
TH-234	185.52	92.97	687.	93.	0.046	123.65	1.499
TH-234	185.51	92.96	671.	93.	0.047	122.18	1.499
RA-226	372.32	186.33	288.	134.	0.067	65.43	1.495s
PB-212	477.22	238.76	363.	450.	0.225	22.86	1.499
RA-224	483.50	241.90	409.	85.	0.042	106.46	1.499s
PB-214	477.35	238.82	432.	218.	0.109	45.32	1.499
PB-214	590.54	295.40	168.	132.	0.066	49.07	1.499
AC-228	676.78	338.50	118.	97.	0.048	56.71	1.499s
PB-214	703.78	351.99	101.	192.	0.096	31.04	1.499D
SB-125	925.53	462.82	46.	31.	0.016	107.44	1.499s
TL-208	1021.32	510.69	68.	92.	0.046	55.11	1.914s
TL-208	1166.61	583.30	60.	175.	0.088	33.05	1.351
BI-214	1219.10	609.53	48.	134.	0.067	36.19	1.092
CS-137	1323.63	661.77	34.	23.	0.012	122.84	1.499s
AC-228	1822.54	911.10	35.	84.	0.042	44.27	1.578
AC-228	1938.41	969.00	48.	50.	0.025	72.09	1.616
BI-214	2240.20	1119.81	52.	53.	0.026	87.73	0.901s
K-40	2922.21	1460.60	7.	534.	0.267	13.28	1.866
BI-214	3530.00	1764.28	0.	28.	0.014	56.69	2.790s

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		1.0799E-01					
			477.56	1.080E-01	%(	3.838E-01	1.13E-01 G
K-40		1.2952E+01					
			1460.75	1.295E+01	(	3.691E-01	5.73E-01 G
MN-54		1.2675E-02					
			834.81	1.267E-02	&(	4.682E-02	1.37E-02 G
CO-57		-3.8281E-04					
			122.07	-3.828E-04	%(P	4.543E-02	1.34E-02 G K
			136.43	4.219E-02	&	3.920E-01	1.17E-01 G
CO-60		1.8348E-02					
			1332.51	1.835E-02	%(P	5.690E-02	1.55E-02 G K
			1173.23	-8.162E-03	& P	7.600E-02	2.01E-02 G K
Sr-85		-4.7364E-03					
			514.00	-4.736E-03	%(	5.548E-02	1.61E-02 G
Kr-85		-1.0817E+02					
			513.99	-1.082E+02	%(	1.267E+03	3.69E+02 G
Y-88		-8.2952E-03					
			1836.01	-8.295E-03	%(P	5.614E-02	1.50E-02 G K
			898.02	-1.063E-02	% P	5.514E-02	1.56E-02 G
NB-94		-5.9308E-03					
			871.10	-5.931E-03	&(	4.541E-02	1.28E-02 G K
			702.50	1.496E-02	%	4.044E-02	1.20E-02 G K
Ag-108M		-1.1401E-02					
			722.95	-1.140E-02	%(	6.023E-02	1.75E-02 G K
			614.37	-3.619E-03	&	5.189E-02	1.48E-02 G
			433.93	-1.147E-03	&	3.845E-02	1.09E-02 G
CD-109		6.2861E-02					
			88.04	6.286E-02	%(	1.363E+00	4.06E-01 G
SN-113		-1.6497E-04					
			391.71	-1.650E-04	%(P	6.187E-02	1.77E-02 G K
			255.04	-1.917E-01	&	1.867E+00	5.50E-01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	7.0970E-02						
		427.95	-1.094E-03	&(	1.292E-01	3.69E-02	G K
		600.77	5.003E-02	&	2.085E-01	6.07E-02	G
		636.15	5.788E-02	%	3.684E-01	1.06E-01	G
		463.51	2.843E-01	*(	3.151E-01	1.02E-01	G
		176.29	-6.855E-02	%	6.177E-01	1.83E-01	G
I-131	-4.3915E-04						
		364.48	-4.391E-04	&(	4.810E-02	1.38E-02	G K
		636.97	1.658E-01	%	6.031E-01	1.77E-01	G
		284.29	0.000E+00	&	6.995E-01	2.04E-01	G
CS-134	-2.0377E-04						
		604.66	-2.038E-04	%(	4.510E-02	1.27E-02	G K
		795.76	1.565E-02	&	4.673E-02	1.38E-02	G
		569.29	1.001E-01	%	2.788E-01	8.31E-02	G
		801.84	3.210E-02	%	4.498E-01	1.24E-01	G
CS-137	3.5441E-02						
		661.62	3.544E-02	(	4.537E-02	1.45E-02	G
CE-139	4.1370E-03						
		165.85	4.137E-03	&(P	3.955E-02	1.17E-02	G
EU-152	1.3151E-03						
		121.78	1.315E-03	&(	1.419E-01	4.21E-02	G K
		344.30	-3.431E-02	%	1.493E-01	4.42E-02	G
		1408.08	8.642E-02	%	1.761E-01	5.42E-02	G
		964.00	2.066E-01	%	4.700E-01	1.42E-01	G
		1112.07	1.197E-04	%	4.259E-01	1.17E-01	G
		778.90	-2.436E-02	%	3.052E-01	8.48E-02	G
EU-154	-2.9292E-02						
		123.10	-2.929E-02	%(	1.006E-01	3.02E-02	G K
		1274.80	-5.313E-04	&	1.573E-01	4.25E-02	G
		723.30	-4.518E-02	%	2.663E-01	7.71E-02	G
		1004.80	-4.516E-02	%	3.532E-01	1.01E-01	G
EU-155	6.1282E-02						
		86.45	6.128E-02	%(	1.361E-01	4.12E-02	G K
		105.31	2.682E-02	%	1.987E-01	5.93E-02	G
HG-203	-1.6550E-02						
		279.17	-1.655E-02	%(P	4.683E-02	1.38E-02	G K
		72.87	-2.193E-01	%	1.183E+00	3.55E-01	G
		70.83	-5.811E-01	%	1.935E+00	5.83E-01	G
		82.50	-7.764E-01	%	2.403E+00	7.24E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.3281E-01						
		583.14	2.328E-01	(	5.149E-02	2.57E-02	G
		510.72	4.097E-01	+	1.845E-01	7.53E-02	G
PB-212	5.1200E-01						
		238.63	5.120E-01	(	1.041E-01	3.90E-02	G K
							Energy duplication
		77.11	6.348E-01	+	3.412E-01	1.09E-01	G
		74.81	8.573E-01	&	6.823E-01	2.13E-01	G
PB-214	3.7724E-01						
							Energy duplication
		351.99	3.618E-01	(	9.352E-02	3.74E-02	G K
		295.22	4.070E-01	(	1.941E-01	6.66E-02	G
							Energy duplication
		77.11	1.038E+00	+	5.581E-01	1.78E-01	G
		241.92	1.446E+00	+	6.611E-01	2.18E-01	G
BI-212	2.4746E-01						
		727.17	2.475E-01	%(	4.324E-01	1.33E-01	G K
		1620.56	-1.181E-01	%	1.460E+00	3.75E-01	G
		785.42	8.803E-01	%	2.179E+00	6.52E-01	G
BI-214	3.4737E-01						
		609.32	3.474E-01	(	9.010E-02	4.19E-02	G K
		1764.51	5.415E-01	+	1.425E-01	1.02E-01	G
		1120.28	7.254E-01	+	4.970E-01	2.12E-01	G
RA-224	1.0736E+00						
		241.00	1.074E+00	(	1.230E+00	3.81E-01	G
RA-226	1.6794E+00						
		185.99	1.679E+00	(	1.025E+00	3.67E-01	G
AC-228	5.1509E-01						
		911.07	5.002E-01	(	1.803E-01	7.38E-02	G K
		968.90	5.219E-01	(	3.627E-01	1.25E-01	G
		338.40	5.411E-01	@(	2.992E-01	1.02E-01	G
TH-227	-1.2493E-01						
		236.00	-1.249E-01	%(	4.325E-01	1.30E-01	G K
		256.25	-1.242E-02	&	5.231E-01	1.53E-01	G
PA-234	5.2489E-02						
		98.44	5.249E-02	%(	1.707E-01	5.13E-02	G K
		946.00	2.372E-03	&	2.779E-01	7.72E-02	G
		131.28	-6.288E-02	%	2.121E-01	6.38E-02	G
		94.67	-1.242E-01	%	3.294E-01	9.95E-02	G
		883.24	-3.765E-03	%	3.429E-01	9.29E-02	G
		926.70	1.078E-01	%	3.977E-01	1.15E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		569.26	1.482E-01	%	4.134E-01	1.23E-01	G
TH-234	9.9362E-01						
		63.29	5.798E-01	%(	2.168E+00	6.51E-01	G K
		92.80	1.191E+00	(	1.580E+00	4.85E-01	G
		92.38	1.391E+00	(	1.869E+00	5.73E-01	G
AM-241	-5.9991E-02						
		59.54	-5.999E-02	%(P	2.595E-01	7.77E-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	1.0659E-01	1.0799E-01	3.4004E-01	3.4009E-01	3.788E-01
K-40		1.2952E+01	1.2952E+01	1.7199E+00	1.8691E+00	
MN-54	#A	1.2647E-02	1.2675E-02	4.0972E-02	4.0979E-02	4.671E-02
CO-57	#B	-3.8182E-04	-3.8281E-04	2.1584E-01	2.1584E-01	4.531E-02
CO-60	#B	1.8342E-02	1.8348E-02	4.6551E-02	4.6562E-02	5.688E-02

Sr-85	#A	-4.6857E-03	-4.7364E-03	4.8424E-02	4.8425E-02	5.489E-02
Kr-85	#A	-1.0817E+02	-1.0817E+02	1.1059E+03	1.1060E+03	1.267E+03
Y-88	#B	-8.2411E-03	-8.2952E-03	5.4673E-02	5.4675E-02	5.577E-02
NB-94	#B	-5.9308E-03	-5.9308E-03	3.8434E-02	3.8436E-02	4.541E-02
Ag-108M	#B	-1.1400E-02	-1.1401E-02	5.2555E-02	5.2559E-02	6.023E-02
CD-109	#A	6.2764E-02	6.2861E-02	1.2173E+00	1.2173E+00	1.361E+00
SN-113	#B	-1.6397E-04	-1.6497E-04	6.6691E-02	6.6691E-02	6.149E-02
SB-125	#B	7.0921E-02	7.0970E-02	7.6250E-02	7.6356E-02	1.291E-01
I-131	#B	-4.0263E-04	-4.3915E-04	4.1439E-02	4.1439E-02	4.410E-02
CS-134	#B	-2.0358E-04	-2.0377E-04	3.8097E-02	3.8097E-02	4.506E-02
CS-137	#A	3.5439E-02	3.5441E-02	4.3535E-02	4.3581E-02	4.537E-02
CE-139	#A	4.1161E-03	4.1370E-03	3.5058E-02	3.5059E-02	3.935E-02
EU-152	#B	1.3149E-03	1.3151E-03	1.2624E-01	1.2624E-01	1.419E-01
EU-154	#B	-2.9285E-02	-2.9292E-02	9.0679E-02	9.0694E-02	1.006E-01
EU-155	#B	6.1259E-02	6.1282E-02	1.2364E-01	1.2368E-01	1.360E-01
HG-203	#B	-1.6303E-02	-1.6550E-02	6.4090E-02	6.4097E-02	4.613E-02
TL-208		2.3281E-01	2.3281E-01	7.6945E-02	7.8062E-02	
PB-212	#	5.1200E-01	5.1200E-01	1.1706E-01	1.2058E-01	1.041E-01
PB-214	#	3.7724E-01	3.7724E-01	1.0953E-01	1.1158E-01	9.352E-02
BI-212	#B	2.4746E-01	2.4746E-01	3.9905E-01	3.9930E-01	4.324E-01
BI-214		3.4737E-01	3.4737E-01	1.2573E-01	1.2725E-01	
RA-224	#A	1.0736E+00	1.0736E+00	1.1431E+00	1.1447E+00	1.230E+00
RA-226		1.6794E+00	1.6794E+00	1.0988E+00	1.1029E+00	
AC-228	#	5.1509E-01	5.1509E-01	1.7487E-01	1.7727E-01	1.803E-01
TH-227	#B	-1.2493E-01	-1.2493E-01	3.8936E-01	3.8943E-01	4.325E-01
PA-234	#B	5.2489E-02	5.2489E-02	1.5402E-01	1.5405E-01	1.707E-01
TH-234	#B	9.9362E-01	9.9362E-01	1.2140E+00	1.2153E+00	2.168E+00
AM-241	#A	-5.9990E-02	-5.9991E-02	2.3799E-01	2.3801E-01	2.595E-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) 1.5211249E+01 pCi/gm
Total Decayed Activity (295.1 to 1999.1 keV) 1.5211251E+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_22APR2005_1142.An1

Sample description
FSS-OOL-14-01-024-P-Q

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_22APR2005_1142.An1

Acquisition information
Start time: 22-Apr-2005 11:42:43
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: 1.8860E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8860E+03) =
5.3022E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

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

Yankee Chemistry Spectrum name: 101F_22APR2005_1142.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	21-Apr-2005 10:45:00
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. 6 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0799

***** 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
77.27	153.	14.40	1.01	1.732E-02	77.11	10.700	5.945E-01	PB214
					77.11	17.500	3.635E-01	PB212
88.54	72.	38.91	0.90	1.939E-02	88.04	3.790	7.006E-01	CD109
238.77	294.	10.03	1.18	1.557E-02	238.63	43.100	3.138E-01	PB212
295.52	80.	16.86	1.16	1.291E-02	295.22	19.200	2.322E-01	PB214
300.06	37.	30.92	1.16	1.273E-02				
339.37	79.	19.78	1.24	1.132E-02	338.40	12.010	4.153E-01	AC228
351.98	154.	12.39	1.17	1.092E-02				
351.98	154.	12.39	1.17	1.092E-02	351.99	37.100	2.722E-01	PB214
463.17	41.	31.91	1.50	8.348E-03				
463.17	41.	31.91	1.50	8.348E-03	463.51	10.000	3.524E-01	SB125
510.89	37.	30.16	1.50	7.590E-03	510.72	22.500	1.550E-01	TL208
583.25	70.	19.86	1.36	6.683E-03	583.14	86.000	8.737E-02	TL208
609.32	82.	14.71	0.97	6.413E-03	609.32	46.090	1.981E-01	BI214
909.93	66.	17.40	1.42	4.451E-03				
909.93	66.	17.40	1.42	4.451E-03	911.07	29.000	3.656E-01	AC228
1460.70	454.	4.78	2.05	2.943E-03	1460.75	10.700	1.034E+01	K40
1764.23	20.	22.36	1.06	2.481E-03	1764.51	15.920	3.628E-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	
154.11	77.55	165.	153.	0.076	43.19	1.007	PB-214	D
176.65	88.54	306.	72.	0.036	116.74	0.896	PB-214	l

599.53	299.89	60.	37.	0.019	101.59	1.089	TH-227	
1820.22	909.93	54.	31.	0.016	112.47	1.425	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-214	153.79	77.11	457.	109.	0.055	87.72	1.499D
PB-212	153.79	77.11	457.	109.	0.055	87.72	1.499D
PB-212	477.14	238.72	177.	235.	0.118	30.93	1.499
PB-214	590.65	295.45	110.	73.	0.037	70.19	1.499
AC-228	676.93	338.57	66.	51.	0.025	79.78	1.499s
PB-214	703.78	351.99	56.	123.	0.062	37.45	1.499D
SB-125	925.05	462.58	20.	35.	0.017	74.79	1.499
TL-208	1021.72	510.89	44.	37.	0.018	90.47	1.499s
TL-208	1166.71	583.35	26.	58.	0.029	54.30	1.499
BI-214	1218.67	609.32	27.	82.	0.041	44.14	0.970s
AC-228	1822.26	910.96	29.	34.	0.017	84.12	1.578s
K-40	2922.41	1460.70	4.	454.	0.227	14.33	2.053
BI-214	3529.89	1764.23	0.	20.	0.010	67.08	1.062s

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

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

Nuclide Name	Nuclide Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		4.4172E-02					
			477.56	4.417E-02	%(	2.377E-01 6.79E-02	G
K-40		1.0341E+01					
			1460.75	1.034E+01	(	2.629E-01 4.94E-01	G
MN-54		-1.0325E-02					
			834.81	-1.032E-02	&(	4.378E-02 1.27E-02	G
CO-57		-9.4623E-04					
			122.07	-9.462E-04	%(P	3.494E-02 1.03E-02	G K
			136.43	-1.803E-02	%	2.470E-01 7.27E-02	G

Yankee Chemistry Spectrum name: 101F_22APR2005_1142.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-60	1.0757E-02						
		1332.51	1.076E-02	%(P	4.450E-02	1.13E-02	G K
		1173.23	-3.871E-03	% P	6.243E-02	1.62E-02	G K
Sr-85	-9.0421E-03						
		514.00	-9.042E-03	&(	4.073E-02	1.19E-02	G
Kr-85	-2.0644E+02						
		513.99	-2.064E+02	&(	9.298E+02	2.73E+02	G
Y-88	3.0758E-03						
		1836.01	3.076E-03	%(P	2.237E-02	4.98E-03	G K
		898.02	-2.076E-03	& P	3.836E-02	1.01E-02	G
NB-94	3.3586E-03						
		871.10	3.359E-03	%(	3.510E-02	9.65E-03	G K
		702.50	-4.125E-03	%	3.547E-02	9.98E-03	G K
Ag-108M	-3.8529E-03						
		722.95	-3.853E-03	%(	4.270E-02	1.20E-02	G K
		614.37	3.193E-04	&	3.399E-02	9.31E-03	G
		433.93	-1.030E-02	%	3.434E-02	1.02E-02	G
CD-109	3.5207E-01						
		88.04	3.521E-01	%(	9.696E-01	2.92E-01	G
SN-113	-3.4693E-03						
		391.71	-3.469E-03	&(P	4.569E-02	1.29E-02	G K
		255.04	2.016E-01	&	1.329E+00	3.90E-01	G
SB-125	6.3961E-02						
		427.95	-1.503E-02	&(	1.029E-01	2.97E-02	G K
		600.77	-8.702E-04	%	1.734E-01	4.78E-02	G
		636.15	0.000E+00	%	2.732E-01	7.44E-02	G
		463.51	2.978E-01	(	2.023E-01	7.42E-02	G
		176.29	-3.369E-02	&	4.808E-01	1.42E-01	G
I-131	6.6165E-03						
		364.48	6.617E-03	&(	3.671E-02	1.07E-02	G K
		636.97	-1.576E-02	%	4.160E-01	1.13E-01	G
		284.29	8.339E-02	&	4.078E-01	1.19E-01	G
CS-134	0.0000E+00						
		604.66	0.000E+00	&(	6.826E-02	1.98E-02	G K
		795.76	1.455E-02	%	3.935E-02	1.17E-02	G
		569.29	4.355E-04	%	1.967E-01	5.41E-02	G
		801.84	0.000E+00	&	6.117E-01	1.72E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-137	1.0354E-02						
		661.62	1.035E-02	&(	4.553E-02	1.32E-02	G
CE-139	8.9998E-03						
		165.85	9.000E-03	&(P	3.135E-02	9.36E-03	G
EU-152	-1.2335E-03						
		121.78	-1.233E-03	%(	1.004E-01	2.95E-02	G K
		344.30	-1.723E-02	%	1.023E-01	2.98E-02	G
		1408.08	3.528E-02	%	1.568E-01	4.32E-02	G
		964.00	1.210E-01	&	3.313E-01	9.84E-02	G
		1112.07	-1.984E-02	&	4.277E-01	1.19E-01	G
		778.90	-2.215E-02	%	2.997E-01	8.35E-02	G
EU-154	1.7562E-02						
		123.10	1.756E-02	%(	6.346E-02	1.90E-02	G K
		1274.80	3.950E-02	%	1.427E-01	4.13E-02	G
		723.30	-2.282E-03	&	1.456E-01	3.89E-02	G
		1004.80	1.007E-03	&	2.550E-01	6.92E-02	G
EU-155	-3.6672E-02						
		86.45	-3.667E-02	%(	1.207E-01	3.63E-02	G K
		105.31	3.204E-02	%	1.273E-01	3.80E-02	G
HG-203	-7.3360E-03						
		279.17	-7.336E-03	%(P	3.669E-02	1.05E-02	G K
		72.87	-1.483E-01	&	8.607E-01	2.57E-01	G
		70.83	3.065E-02	%	1.424E+00	4.21E-01	G
		82.50	-3.255E-03	&	1.456E+00	4.27E-01	G
TL-208	7.2208E-02						
		583.14	7.221E-02	(	3.300E-02	1.31E-02	G
		510.72	1.550E-01	+	1.404E-01	4.67E-02	G
PB-212	2.5386E-01						
		238.63	2.512E-01	(	6.901E-02	2.59E-02	G K
							Energy duplication
		77.11	2.605E-01	(	2.437E-01	7.62E-02	G
		74.81	2.717E-01	&	4.970E-01	1.51E-01	G
PB-214	2.1553E-01						
							Energy duplication
		351.99	2.176E-01	(	6.671E-02	2.72E-02	G K
		295.22	2.115E-01	(	1.491E-01	4.95E-02	G
							Energy duplication
		77.11	4.261E-01	+	3.985E-01	1.25E-01	G
		241.92	-2.231E-01	%	5.013E-01	1.52E-01	G

Yankee Chemistry Spectrum name: 101F_22APR2005_1142.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-212	2.2162E-01						
		727.17	2.216E-01	%(	3.023E-01	9.64E-02	G K
		1620.56	1.012E-01	%	1.138E+00	2.83E-01	G
		785.42	-1.942E-01	&	1.970E+00	5.52E-01	G
BI-214	1.9806E-01						
		609.32	1.981E-01	*(	6.560E-02	2.91E-02	G K
		1764.51	3.628E-01	+	1.337E-01	8.11E-02	G
		1120.28	1.720E-01	%	3.814E-01	1.15E-01	G
RA-224	2.8206E-02						
		241.00	2.821E-02	%(	9.127E-01	2.68E-01	G
RA-226	5.6323E-01						
		185.99	5.632E-01	%(	8.161E-01	2.52E-01	G
AC-228	2.1357E-01						
		911.07	1.911E-01	*(	1.553E-01	5.36E-02	G K
		968.90	1.505E-01	%	2.705E-01	8.34E-02	G
		338.40	2.677E-01	*(	2.136E-01	7.12E-02	G
TH-227	-9.8725E-02						
		236.00	-9.872E-02	%(	3.079E-01	9.23E-02	G K
		256.25	1.297E-01	%	3.926E-01	1.17E-01	G
PA-234	-4.4844E-03						
		98.44	-4.484E-03	%(	1.064E-01	3.12E-02	G K
		946.00	5.552E-02	%	1.933E-01	5.61E-02	G
		131.28	3.622E-03	&	1.603E-01	4.73E-02	G
		94.67	-4.008E-02	%	1.968E-01	5.86E-02	G
		883.24	-1.081E-02	%	2.904E-01	7.83E-02	G
		926.70	3.302E-02	%	3.426E-01	9.44E-02	G
		569.26	1.431E-03	%	2.916E-01	8.03E-02	G
TH-234	7.0528E-01						
		63.29	7.053E-01	%(	1.451E+00	4.40E-01	G K
		92.80	6.045E-01	%	1.168E+00	3.55E-01	G
		92.38	-8.971E-02	&	1.431E+00	4.24E-01	G
AM-241	-1.1307E-02						
		59.54	-1.131E-02	%(P	1.954E-01	5.76E-02	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.

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

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
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	4.3579E-02	4.4172E-02	2.0364E-01	2.0366E-01	2.345E-01
K-40		1.0341E+01	1.0341E+01	1.4816E+00	1.5927E+00	
MN-54	#A	-1.0301E-02	-1.0325E-02	3.8041E-02	3.8046E-02	4.368E-02
CO-57	#B	-9.4370E-04	-9.4623E-04	1.0718E-01	1.0718E-01	3.485E-02
CO-60	#B	1.0753E-02	1.0757E-02	3.3855E-02	3.3860E-02	4.448E-02
Sr-85	#A	-8.9422E-03	-9.0421E-03	3.5809E-02	3.5812E-02	4.028E-02
Kr-85	#A	-2.0644E+02	-2.0644E+02	8.1753E+02	8.1761E+02	9.298E+02
Y-88	#B	3.0551E-03	3.0758E-03	1.4949E-02	1.4950E-02	2.222E-02
NB-94	#B	3.3586E-03	3.3586E-03	2.8956E-02	2.8957E-02	3.510E-02
Ag-108M	#B	-3.8528E-03	-3.8529E-03	3.6009E-02	3.6009E-02	4.270E-02
CD-109	#A	3.5152E-01	3.5207E-01	8.7648E-01	8.7670E-01	9.681E-01
SN-113	#B	-3.4477E-03	-3.4693E-03	8.9223E-02	8.9223E-02	4.541E-02
SB-125	#B	6.3915E-02	6.3961E-02	4.7839E-02	4.7975E-02	1.028E-01
I-131	#B	6.0490E-03	6.6165E-03	3.2026E-02	3.2028E-02	3.356E-02
CS-134	#B	0.0000E+00	0.0000E+00	5.9338E-02	5.9338E-02	6.819E-02
CS-137	#A	1.0353E-02	1.0354E-02	3.9645E-02	3.9650E-02	4.553E-02
CE-139	#A	8.9527E-03	8.9998E-03	2.8074E-02	2.8079E-02	3.118E-02
EU-152	#B	-1.2333E-03	-1.2335E-03	8.8604E-02	8.8604E-02	1.004E-01
EU-154	#B	1.7558E-02	1.7562E-02	5.6887E-02	5.6895E-02	6.345E-02
EU-155	#B	-3.6657E-02	-3.6672E-02	1.0881E-01	1.0883E-01	1.206E-01

HG-203 #B	-7.2233E-03	-7.3360E-03	8.4474E-02	8.4475E-02	3.612E-02

TL-208	#	7.2208E-02	7.2208E-02	3.9210E-02	3.9421E-02	3.300E-02
PB-212	#	2.5386E-01	2.5386E-01	7.8529E-02	7.9828E-02	6.901E-02
PB-214	#	2.1553E-01	2.1553E-01	8.0715E-02	8.1628E-02	6.671E-02
BI-212	#B	2.2162E-01	2.2162E-01	2.8915E-01	2.8942E-01	3.023E-01
BI-214		1.9806E-01	1.9806E-01	8.7422E-02	8.8135E-02	
RA-224	#A	2.8206E-02	2.8206E-02	8.0350E-01	8.0350E-01	9.127E-01
RA-226	#A	5.6323E-01	5.6323E-01	7.5458E-01	7.5525E-01	8.161E-01
AC-228	#	2.1357E-01	2.1357E-01	1.2380E-01	1.2439E-01	1.553E-01
TH-227	#B	-9.8725E-02	-9.8725E-02	2.7685E-01	2.7690E-01	3.079E-01
PA-234	#B	-4.4844E-03	-4.4844E-03	9.3748E-02	9.3749E-02	1.064E-01
TH-234	#B	7.0528E-01	7.0528E-01	1.3202E+00	1.3208E+00	1.451E+00
AM-241	#A	-1.1307E-02	-1.1307E-02	1.9206E-01	1.9206E-01	1.954E-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 (88.2 to 1999.1 keV) 1.0539250E+01 pCi/gm
Total Decayed Activity (88.2 to 1999.1 keV) 1.0539250E+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_22APR2005_1218.An1

Sample description
FSS-OOL-14-01-026-P-Q

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_22APR2005_1218.An1

Acquisition information
Start time: 22-Apr-2005 12:19:06
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: 1.8230E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8230E+03) =
5.4855E+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_22APR2005_1218.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	21-Apr-2005 11:05:00
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: 0.1461

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.87	213.	23.01	1.50	1.654E-02	70.83	3.520	3.016E+00	HG203
					74.81	9.600	9.955E-01	PB212
77.20	277.	17.27	1.50	1.720E-02	77.11	10.700	1.117E+00	PB214
					77.11	17.500	6.827E-01	PB212
77.20	277.	17.27	1.50	1.720E-02	77.11	10.700	1.117E+00	PB214
					77.11	17.500	6.827E-01	PB212
87.11	118.	38.61	1.50	1.910E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	1.195E+00	CD109
93.17	98.	37.11	1.28	1.993E-02	92.38	2.570	1.424E+00	TH234
					92.80	3.000	1.217E+00	TH234
129.06	87.	36.95	0.67	2.110E-02				
186.13	127.	31.02	1.24	1.857E-02	185.99	3.280	1.541E+00	RA226
238.83	887.	5.14	1.08	1.556E-02	238.63	43.100	9.795E-01	PB212
269.71	88.	27.67	1.21	1.403E-02				
295.12	146.	16.54	1.24	1.292E-02				
295.12	146.	16.54	1.24	1.292E-02	295.22	19.200	4.363E-01	PB214
300.29	68.	24.78	1.34	1.272E-02				
338.47	171.	16.77	1.21	1.135E-02	338.40	12.010	9.310E-01	AC228
352.00	284.	10.03	1.00	1.092E-02	351.99	37.100	5.192E-01	PB214
463.08	44.	34.02	1.02	8.349E-03				
463.08	44.	34.02	1.02	8.349E-03	463.51	10.000	3.913E-01	SB125
510.83	117.	14.15	1.35	7.589E-03	510.72	22.500	5.087E-01	TL208
583.17	240.	9.19	1.72	6.684E-03	583.14	86.000	3.097E-01	TL208
609.20	192.	10.13	1.29	6.414E-03	609.32	46.090	4.815E-01	BI214
727.50	63.	19.37	0.96	5.441E-03	727.17	11.800	7.317E-01	BI212
795.07	46.	24.38	0.96	5.020E-03				

795.07	46.	24.38	0.96	5.020E-03	795.76	85.400	8.002E-02	CS134
911.27	139.	12.10	1.47	4.446E-03	911.07	29.000	7.979E-01	AC228
968.26	119.	16.23	1.70	4.215E-03	968.90	17.460	1.199E+00	AC228
1108.60	23.	35.87	1.50	3.745E-03				
1120.10	60.	25.12	0.81	3.711E-03	1120.28	15.040	7.996E-01	BI214
1460.72	640.	4.01	1.71	2.943E-03	1460.75	10.700	1.506E+01	K40

Yankee Chemistry Spectrum name: 101F_22APR2005_1218.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1764.36	36.	16.67	1.69	2.481E-03	1764.51	15.920	6.755E-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
477.37	238.83	1128.	157.	0.079	93.60	1.076	PB-212
539.14	269.71	200.	88.	0.044	83.01	1.209	AC-228 s
600.34	300.29	108.	68.	0.034	74.35	1.342	PB-212
2217.77	1108.60	20.	23.	0.012	101.67	1.501	KR-89

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	146.71	73.57	1142.	-141.	-0.070	105.00	1.499s
PB-212	149.31	74.87	1098.	213.	0.107	69.04	1.499
PB-214	153.79	77.11	1007.	277.	0.139	51.80	1.499D
PB-212	153.79	77.11	1007.	277.	0.139	51.80	1.499D
EU-155	173.80	87.11	976.	118.	0.059	115.84	1.499
TH-234	185.77	93.10	908.	138.	0.069	96.28	1.499s
RA-226	371.92	186.13	522.	119.	0.059	86.15	1.499
PB-212	477.31	238.81	409.	671.	0.335	17.25	1.499
PB-214	590.40	295.33	195.	145.	0.073	47.84	1.499
AC-228	676.73	338.47	198.	171.	0.086	50.30	1.208
PB-214	703.78	351.99	147.	249.	0.124	28.12	1.499D
SB-125	926.17	463.14	70.	42.	0.021	95.91	1.499
TL-208	1021.59	510.83	66.	117.	0.059	42.46	1.351s
TL-208	1166.36	583.17	80.	240.	0.120	27.58	1.715s
BI-214	1218.44	609.20	62.	192.	0.096	30.38	1.290s
BI-212	1455.15	727.50	34.	63.	0.032	58.10	0.961s
CS-134	1590.29	795.03	24.	33.	0.016	82.39	1.502s
AC-228	1822.88	911.27	46.	139.	0.069	36.30	1.473
AC-228	1936.93	968.26	62.	119.	0.060	48.70	1.697
BI-214	2240.78	1120.10	47.	60.	0.030	75.36	0.813s
K-40	2922.46	1460.72	5.	640.	0.320	12.03	1.715
BI-214	3530.16	1764.36	0.	36.	0.018	50.00	1.686

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		-1.2029E-02					
			477.56	-1.203E-02	&(	4.009E-01 1.15E-01	G
K-40		1.5064E+01					
			1460.75	1.506E+01	(	3.140E-01 6.04E-01	G
MN-54		0.0000E+00					
			834.81	0.000E+00	%(	5.143E-02 1.43E-02	G
CO-57		-8.1879E-03					
			122.07	-8.188E-03	%(P	5.311E-02 1.59E-02	G K
			136.43	9.388E-02	%	4.269E-01 1.28E-01	G
CO-60		6.6162E-03					
			1332.51	6.616E-03	%(P	5.981E-02 1.56E-02	G K
			1173.23	-2.416E-02	% P	8.414E-02 2.30E-02	G K
Sr-85		-2.9250E-02					
			514.00	-2.925E-02	&(	6.692E-02 2.02E-02	G
Kr-85		-6.6781E+02					
			513.99	-6.678E+02	&(	1.528E+03 4.62E+02	G
Y-88		5.3396E-04					
			1836.01	5.340E-04	%(P	5.212E-02 1.32E-02	G K
			898.02	1.432E-02	% P	5.130E-02 1.49E-02	G
NB-94		2.5088E-03					
			871.10	2.509E-03	%(	4.887E-02 1.37E-02	G K
			702.50	1.167E-02	&	5.934E-02 1.74E-02	G K
Ag-108M		1.5934E-03					
			722.95	1.593E-03	%(	1.005E-01 2.93E-02	G K
			614.37	1.698E-03	%	3.430E-02 9.46E-03	G
			433.93	-7.052E-03	%	4.524E-02 1.32E-02	G
CD-109		-1.7266E-01					
			88.04	-1.727E-01	&(	1.618E+00 4.85E-01	G
SN-113		1.0018E-02					
			391.71	1.002E-02	%(P	6.222E-02 1.82E-02	G K
			255.04	2.871E-01	%	1.939E+00 5.75E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	9.8538E-02						
		427.95	5.088E-03	%(	1.283E-01	3.69E-02	G K
		600.77	4.090E-02	&	2.127E-01	6.15E-02	G
		636.15	-1.145E-02	&	4.142E-01	1.17E-01	G
		463.51	3.752E-01	(	3.704E-01	1.20E-01	G
		176.29	-1.957E-02	&	6.838E-01	2.03E-01	G
I-131	4.8644E-04						
		364.48	4.864E-04	&(	5.604E-02	1.62E-02	G K
		636.97	1.438E-01	%	6.396E-01	1.86E-01	G
		284.29	1.340E-01	%	7.702E-01	2.28E-01	G
CS-134	2.0401E-02						
		604.66	-1.167E-02	%(	5.198E-02	1.53E-02	G K
		795.76	5.706E-02	(	4.461E-02	1.57E-02	G
		569.29	2.229E-02	%	2.309E-01	6.55E-02	G
		801.84	-6.389E-02	%	4.947E-01	1.40E-01	G
CS-137	2.0124E-02						
		661.62	2.012E-02	&(	4.487E-02	1.35E-02	G
CE-139	8.0391E-03						
		165.85	8.039E-03	&(P	5.269E-02	1.57E-02	G
EU-152	-1.7873E-02						
		121.78	-1.787E-02	%(	1.532E-01	4.57E-02	G K
		344.30	-1.543E-02	%	1.540E-01	4.51E-02	G
		1408.08	-2.594E-02	&	2.419E-01	6.63E-02	G
		964.00	9.971E-02	%	4.761E-01	1.39E-01	G
		1112.07	8.826E-02	&	4.026E-01	1.16E-01	G
		778.90	3.181E-03	&	2.958E-01	8.08E-02	G
EU-154	-9.9183E-03						
		123.10	-9.918E-03	%(	1.008E-01	3.00E-02	G K
		1274.80	2.761E-02	&	1.857E-01	5.28E-02	G
		723.30	-1.377E-01	%	3.487E-01	1.05E-01	G
		1004.80	-2.779E-02	%	3.088E-01	8.69E-02	G
EU-155	1.3978E-01						
		86.45	1.398E-01	(	1.759E-01	5.40E-02	G K
		105.31	0.000E+00	%	2.231E-01	6.64E-02	G
HG-203	6.9596E-03						
		279.17	6.960E-03	%(P	5.296E-02	1.56E-02	G K
		72.87	-4.162E-01	%	1.256E+00	3.79E-01	G
		70.83	-1.990E+00	&	2.266E+00	6.97E-01	G
		82.50	-9.217E-01	&	2.816E+00	8.50E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.0973E-01						
		583.14	3.097E-01	(	5.717E-02	2.85E-02	G
		510.72	5.087E-01	+	1.758E-01	7.20E-02	G
PB-212	7.2413E-01						
		238.63	7.410E-01	(	1.071E-01	4.26E-02	G K
							Energy duplication
		77.11	6.827E-01	(	3.708E-01	1.18E-01	G
		74.81	9.955E-01	&	7.334E-01	2.29E-01	G
PB-214	4.4733E-01						
							Energy duplication
		351.99	4.545E-01	(	1.083E-01	4.26E-02	G K
		295.22	4.335E-01	(	2.026E-01	6.91E-02	G
							Energy duplication
		77.11	1.117E+00	+	6.065E-01	1.93E-01	G
		241.92	-1.775E-02	%	7.544E-01	2.24E-01	G
BI-212	7.3174E-01						
		727.17	7.317E-01	*(	3.430E-01	1.42E-01	G K
		1620.56	0.000E+00	%	2.568E+00	6.97E-01	G
		785.42	1.530E+00	%	2.408E+00	7.50E-01	G
BI-214	4.8155E-01						
		609.32	4.815E-01	*(	9.882E-02	4.88E-02	G K
		1764.51	6.755E-01	+	1.383E-01	1.13E-01	G
		1120.28	7.996E-01	+	4.594E-01	2.01E-01	G
RA-224	7.2100E-01						
		241.00	7.210E-01	%(	1.355E+00	4.12E-01	G
RA-226	1.4437E+00						
		185.99	1.444E+00	(	1.327E+00	4.15E-01	G
AC-228	8.3689E-01						
		911.07	7.979E-01	(	1.977E-01	9.66E-02	G K
		968.90	1.199E+00	+	3.972E-01	1.95E-01	G
		338.40	9.310E-01	(	3.712E-01	1.56E-01	G
TH-227	-8.9248E-02						
		236.00	-8.925E-02	&(	4.446E-01	1.33E-01	G K
		256.25	3.149E-02	%	4.621E-01	1.35E-01	G
PA-234	-4.4286E-02						
		98.44	-4.429E-02	%(	2.038E-01	6.12E-02	G K
		946.00	-4.123E-02	&	2.800E-01	8.01E-02	G
		131.28	-3.014E-02	%	2.337E-01	6.99E-02	G
		94.67	-1.044E-01	&	3.568E-01	1.07E-01	G
		883.24	-8.250E-02	&	4.902E-01	1.42E-01	G
		926.70	8.080E-03	%	4.442E-01	1.23E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 2.985E-02 %   3.427E-01 9.71E-02 G

TH-234       1.0614E+00
                           63.29 5.619E-01 %(  2.374E+00 7.13E-01 G K
                           92.80 1.711E+00  (  1.778E+00 5.49E-01 G
                           92.38-2.475E-01 %   2.168E+00 6.49E-01 G

AM-241      -4.7465E-02
                           59.54-4.747E-02 %(P 3.207E-01 9.59E-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	-1.1866E-02	-1.2029E-02	3.4424E-01	3.4424E-01	3.955E-01
K-40		1.5064E+01	1.5064E+01	1.8126E+00	2.0025E+00	
MN-54	#A	0.0000E+00	0.0000E+00	4.3011E-02	4.3011E-02	5.131E-02
CO-57	#B	-8.1658E-03	-8.1879E-03	5.4345E-02	5.4347E-02	5.297E-02
CO-60	#B	6.6137E-03	6.6162E-03	4.6872E-02	4.6874E-02	5.979E-02

Sr-85	#A	-2.8923E-02	-2.9250E-02	6.0673E-02	6.0695E-02	6.618E-02
Kr-85	#A	-6.6780E+02	-6.6781E+02	1.3850E+03	1.3856E+03	1.528E+03
Y-88	#B	5.3032E-04	5.3396E-04	3.9613E-02	3.9613E-02	5.176E-02
NB-94	#B	2.5088E-03	2.5088E-03	4.0985E-02	4.0986E-02	4.887E-02
Ag-108M	#B	1.5934E-03	1.5934E-03	8.7951E-02	8.7951E-02	1.005E-01
CD-109	#A	-1.7239E-01	-1.7266E-01	1.4536E+00	1.4537E+00	1.616E+00
SN-113	#B	9.9549E-03	1.0018E-02	5.4580E-02	5.4583E-02	6.183E-02
SB-125	#B	9.8467E-02	9.8538E-02	9.4504E-02	9.4668E-02	1.282E-01
I-131	#B	4.4428E-04	4.8644E-04	4.8727E-02	4.8727E-02	5.118E-02
CS-134	#B	2.0381E-02	2.0401E-02	1.6808E-02	1.6847E-02	5.193E-02
CS-137	#A	2.0123E-02	2.0124E-02	4.0644E-02	4.0660E-02	4.487E-02
CE-139	#A	7.9966E-03	8.0391E-03	4.7169E-02	4.7171E-02	5.241E-02
EU-152	#B	-1.7870E-02	-1.7873E-02	1.3718E-01	1.3719E-01	1.531E-01
EU-154	#B	-9.9159E-03	-9.9183E-03	9.0091E-02	9.0093E-02	1.008E-01
EU-155	#A	1.3973E-01	1.3978E-01	1.6192E-01	1.6211E-01	1.759E-01
HG-203	#B	6.8516E-03	6.9596E-03	4.6773E-02	4.6774E-02	5.214E-02
TL-208		3.0973E-01	3.0973E-01	8.5420E-02	8.7195E-02	
PB-212	#	7.2413E-01	7.2413E-01	1.2494E-01	1.3147E-01	1.071E-01
PB-214	#	4.4733E-01	4.4733E-01	1.2412E-01	1.2666E-01	1.083E-01
BI-212	#	7.3174E-01	7.3174E-01	4.2514E-01	4.2714E-01	
BI-214		4.8155E-01	4.8155E-01	1.4629E-01	1.4880E-01	
RA-224	#A	7.2100E-01	7.2100E-01	1.2357E+00	1.2364E+00	1.355E+00
RA-226	#	1.4437E+00	1.4437E+00	1.2438E+00	1.2464E+00	1.327E+00
AC-228		8.3689E-01	8.3689E-01	2.5956E-01	2.6383E-01	
TH-227	#B	-8.9248E-02	-8.9248E-02	3.9864E-01	3.9867E-01	4.446E-01
PA-234	#B	-4.4286E-02	-4.4286E-02	1.8359E-01	1.8361E-01	2.038E-01
TH-234	#B	1.0614E+00	1.0614E+00	1.0219E+00	1.0236E+00	2.374E+00
AM-241	#A	-4.7465E-02	-4.7465E-02	2.9535E-01	2.9536E-01	3.207E-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) 1.7423597E+01 pCi/gm
Total Decayed Activity (50.2 to 1999.1 keV) 1.7423597E+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_22APR2005_1255.An1

Sample description
FSS-OOL-14-01-023-P-Q

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_22APR2005_1255.An1

Acquisition information

Start time:	22-Apr-2005 12:55:35
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:	1.7770E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.7770E+03) = 5.6275E+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_22APR2005_1255.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	21-Apr-2005 11:20:00
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: 0.1329

***** 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	187.	25.84	1.50	1.654E-02	74.81	9.600	8.970E-01	PB212
77.14	347.	13.60	1.50	1.720E-02	77.11	10.700	1.432E+00	PB214
					77.11	17.500	8.754E-01	PB212
77.14	347.	13.60	1.50	1.720E-02	77.11	10.700	1.432E+00	PB214
					77.11	17.500	8.754E-01	PB212
93.37	107.	40.68	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.365E+00	TH234
186.38	103.	28.56	1.17	1.856E-02	185.99	3.280	1.288E+00	RA226
209.70	135.	24.04	1.33	1.719E-02				
238.84	814.	4.14	1.12	1.556E-02	238.63	43.100	9.221E-01	PB212
241.59	90.	26.60	1.12	1.542E-02	241.00	3.900	1.139E+00	RA224
					241.92	7.470	5.963E-01	PB214
269.86	74.	25.78	1.21	1.402E-02				
295.31	139.	13.45	1.16	1.291E-02	295.22	19.200	4.259E-01	PB214
300.08	46.	34.13	1.16	1.272E-02				
338.46	194.	14.02	1.28	1.135E-02	338.40	12.010	1.082E+00	AC228
352.11	256.	10.07	0.87	1.092E-02	351.99	37.100	4.803E-01	PB214
510.95	127.	15.60	1.75	7.587E-03	510.72	22.500	5.673E-01	TL208
583.19	246.	9.59	1.30	6.684E-03	583.14	86.000	3.252E-01	TL208
609.26	182.	9.71	1.30	6.413E-03	609.32	46.090	4.696E-01	BI214
661.97	70.	24.12	0.80	5.935E-03	661.62	84.620	1.054E-01	CS137
727.15	58.	26.58	1.25	5.443E-03	727.17	11.800	6.903E-01	BI212
794.99	27.	31.78	1.50	5.016E-03	795.76	85.400	4.861E-02	CS134
911.12	173.	11.02	1.99	4.446E-03	911.07	29.000	1.018E+00	AC228
968.30	97.	16.63	1.62	4.214E-03	968.90	17.460	1.003E+00	AC228
1119.51	74.	22.75	1.74	3.713E-03	1120.28	15.040	1.015E+00	BI214

1460.64	618.	4.13	2.08	2.943E-03	1460.75	10.700	1.492E+01	K40
1764.20	29.	18.57	0.97	2.481E-03	1764.51	15.920	5.583E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
419.07	209.70	340.	135.	0.068	72.11	1.326	NP-239	s
477.39	238.82	159.	814.	0.407	12.41	1.122	PB-212	D
482.88	241.56	243.	90.	0.045	79.80	1.124	PB-214	D
539.45	269.86	136.	74.	0.037	77.34	1.209	AC-228	s
599.99	300.12	120.	47.	0.023	108.13	0.958	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	149.28	74.85	1078.	187.	0.094	77.53	1.499
PB-214	153.79	77.11	937.	347.	0.173	40.79	1.499D
PB-212	153.79	77.11	937.	347.	0.173	40.79	1.499D
TH-234	186.31	93.37	895.	107.	0.054	122.03	1.499s
RA-226	372.33	186.34	451.	100.	0.050	94.61	1.499
PB-212	477.35	238.83	423.	696.	0.348	16.93	1.499
PB-214	590.44	295.35	204.	151.	0.076	46.88	1.499
AC-228	676.70	338.46	182.	194.	0.097	42.07	1.276
PB-214	703.87	352.04	130.	212.	0.106	30.73	1.499s
TL-208	1021.84	510.95	84.	127.	0.064	46.80	1.748s
TL-208	1166.39	583.19	91.	246.	0.123	28.78	1.302
BI-214	1218.56	609.26	52.	182.	0.091	29.12	1.295s
CS-137	1324.02	661.97	62.	70.	0.035	72.35	0.796s
BI-212	1454.46	727.15	63.	58.	0.029	79.74	1.246s
CS-134	1590.20	794.99	24.	27.	0.014	95.35	1.502s
AC-228	1822.60	911.12	51.	173.	0.086	33.07	1.988s
AC-228	1937.01	968.30	48.	97.	0.049	49.89	1.617
BI-214	2239.61	1119.51	50.	74.	0.037	68.26	1.743s
K-40	2922.30	1460.64	8.	618.	0.309	12.38	2.079
BI-214	3529.83	1764.20	0.	29.	0.014	55.71	0.974s

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		-8.9207E-02					
			477.56	-8.921E-02	%(	3.874E-01 1.14E-01	G
K-40		1.4917E+01					
			1460.75	1.492E+01	(	3.917E-01 6.16E-01	G
MN-54		2.0840E-02					
			834.81	2.084E-02	%(	4.615E-02 1.39E-02	G
CO-57		-8.9970E-04					
			122.07	-8.997E-04	&(P	4.694E-02 1.39E-02	G K
			136.43	-1.431E-02	&	4.209E-01 1.25E-01	G
CO-60		8.2117E-03					
			1332.51	8.212E-03	%(P	6.635E-02 1.77E-02	G K
			1173.23	3.825E-03	% P	7.099E-02 1.92E-02	G K
Sr-85		-1.3282E-02					
			514.00	-1.328E-02	%(	5.646E-02 1.67E-02	G
Kr-85		-3.0314E+02					
			513.99	-3.031E+02	%(	1.289E+03 3.81E+02	G
Y-88		-6.5601E-03					
			1836.01	-6.560E-03	%(P	4.894E-02 1.27E-02	G K
			898.02	-2.349E-03	% P	4.421E-02 1.18E-02	G
NB-94		0.0000E+00					
			871.10	0.000E+00	%(	6.387E-02 1.80E-02	G K
			702.50	7.593E-03	%	3.695E-02 1.06E-02	G K
Ag-108M		-1.8849E-02					
			722.95	-1.885E-02	%(	6.639E-02 1.96E-02	G K
			614.37	-1.286E-02	&	5.676E-02 1.67E-02	G
			433.93	-1.558E-02	%	5.103E-02 1.52E-02	G
CD-109		-4.4284E-02					
			88.04	-4.428E-02	%(	1.602E+00 4.78E-01	G
SN-113		-1.1376E-03					
			391.71	-1.138E-03	%(P	6.298E-02 1.80E-02	G K
			255.04	2.672E-02	%	1.947E+00 5.71E-01	G

Yankee Chemistry Spectrum name: 101F_22APR2005_1255.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-1.0488E-02						
		427.95	-1.049E-02	%(	1.493E-01	4.33E-02	G K
		600.77	3.835E-02	&	2.728E-01	7.91E-02	G
		636.15	-5.244E-02	%	4.595E-01	1.33E-01	G
		463.51	2.898E-01	%	4.499E-01	1.39E-01	G
		176.29	-1.122E-01	&	6.704E-01	2.00E-01	G
I-131	2.0710E-02						
		364.48	2.071E-02	%(	4.876E-02	1.47E-02	G K
		636.97	2.584E-01	%	6.849E-01	2.05E-01	G
		284.29	-1.095E-02	%	7.188E-01	2.10E-01	G
CS-134	2.3371E-02						
		604.66	1.285E-03	%(	1.133E-01	3.34E-02	G K
		795.76	4.861E-02	(	4.549E-02	1.55E-02	G
		569.29	2.056E-02	&	2.562E-01	7.29E-02	G
		801.84	1.626E-01	%	4.973E-01	1.47E-01	G
CS-137	1.0535E-01						
		661.62	1.054E-01	@(	5.982E-02	2.54E-02	G
CE-139	-1.0336E-02						
		165.85	-1.034E-02	%(P	5.312E-02	1.59E-02	G
EU-152	-2.2658E-02						
		121.78	-2.266E-02	&(	1.302E-01	3.89E-02	G K
		344.30	1.230E-02	&	1.481E-01	4.32E-02	G
		1408.08	1.632E-02	%	2.536E-01	6.87E-02	G
		964.00	-1.499E-04	%	4.619E-01	1.30E-01	G
		1112.07	-1.298E-01	%	5.918E-01	1.73E-01	G
		778.90	-6.412E-02	%	3.920E-01	1.13E-01	G
EU-154	1.4612E-02						
		123.10	1.461E-02	%(	1.040E-01	3.10E-02	G K
		1274.80	9.776E-03	&	1.762E-01	4.88E-02	G
		723.30	-7.156E-02	%	3.336E-01	9.80E-02	G
		1004.80	-4.388E-02	%	3.123E-01	8.87E-02	G
EU-155	4.4679E-02						
		86.45	4.468E-02	%(	1.648E-01	4.96E-02	G K
		105.31	3.849E-04	&	2.123E-01	6.30E-02	G
HG-203	-3.4069E-03						
		279.17	-3.407E-03	%(P	4.823E-02	1.39E-02	G K
		72.87	-7.024E-01	%	1.343E+00	4.08E-01	G
		70.83	-1.327E+00	&	2.270E+00	6.91E-01	G
		82.50	1.719E-02	%	2.299E+00	6.83E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.2516E-01						
		583.14	3.252E-01	(	6.246E-02	3.12E-02	G
		510.72	5.673E-01	+	2.018E-01	8.85E-02	G
PB-212	8.2469E-01						
		238.63	7.880E-01	(	1.116E-01	4.45E-02	G K
							Energy duplication
		77.11	8.754E-01	@(	3.672E-01	1.19E-01	G
		74.81	8.970E-01	&(	7.457E-01	2.32E-01	G
PB-214	4.2044E-01						
		351.99	3.981E-01	(	1.048E-01	4.08E-02	G K
		295.22	4.636E-01	(	2.122E-01	7.24E-02	G
							Energy duplication
		77.11	1.432E+00	+	6.005E-01	1.95E-01	G
		241.92	-7.388E-03	%	7.865E-01	2.33E-01	G
BI-212	6.9029E-01						
		727.17	6.903E-01	@(	4.690E-01	1.83E-01	G K
		1620.56	2.616E-01	%	1.835E+00	5.00E-01	G
		785.42	1.192E+00	%	2.384E+00	7.26E-01	G
BI-214	4.9234E-01						
		609.32	4.696E-01	(	9.385E-02	4.56E-02	G K
		1764.51	5.583E-01	(	1.419E-01	1.04E-01	G
		1120.28	1.015E+00	+	4.837E-01	2.31E-01	G
RA-224	8.0462E-01						
		241.00	8.046E-01	&(	1.372E+00	4.18E-01	G
RA-226	1.2526E+00						
		185.99	1.253E+00	(	1.269E+00	3.95E-01	G
AC-228	1.0270E+00						
		911.07	1.018E+00	@(	2.128E-01	1.12E-01	G K
		968.90	1.003E+00	(	3.619E-01	1.67E-01	G
		338.40	1.082E+00	(	3.659E-01	1.52E-01	G
TH-227	-9.1983E-03						
		236.00	-9.198E-03	&(	4.970E-01	1.47E-01	G K
		256.25	3.202E-02	&	6.032E-01	1.77E-01	G
PA-234	7.8703E-03						
		98.44	7.870E-03	%(	1.939E-01	5.77E-02	G K
		946.00	-5.553E-02	%	2.668E-01	7.70E-02	G
		131.28	1.668E-03	&	2.009E-01	5.95E-02	G
		94.67	-1.789E-01	%	3.439E-01	1.04E-01	G
		883.24	0.000E+00	&	4.421E-01	1.23E-01	G
		926.70	6.194E-02	%	3.957E-01	1.12E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 2.782E-02 &   3.803E-01 1.08E-01 G

TH-234       8.5610E-01
                           63.29 4.650E-01 &(  2.325E+00 6.97E-01 G K
                           92.80 1.365E+00 *(  1.811E+00 5.55E-01 G
                           92.38-4.760E-02 &   2.101E+00 6.26E-01 G

AM-241       4.1056E-02
                           59.54 4.106E-02 %(P 2.911E-01 8.69E-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	-8.7981E-02	-8.9207E-02	3.4101E-01	3.4104E-01	3.821E-01
K-40		1.4917E+01	1.4917E+01	1.8467E+00	2.0300E+00	
MN-54	#A	2.0791E-02	2.0840E-02	4.1829E-02	4.1845E-02	4.604E-02
CO-57	#B	-8.9724E-04	-8.9970E-04	1.7644E-01	1.7644E-01	4.681E-02
CO-60	#B	8.2085E-03	8.2117E-03	5.3079E-02	5.3081E-02	6.632E-02

Sr-85	#A	-1.3132E-02	-1.3282E-02	5.0113E-02	5.0118E-02	5.582E-02
Kr-85	#A	-3.0314E+02	-3.0314E+02	1.1438E+03	1.1439E+03	1.289E+03
Y-88	#B	-6.5148E-03	-6.5601E-03	4.8770E-02	4.8771E-02	4.861E-02
NB-94	#B	0.0000E+00	0.0000E+00	5.4098E-02	5.4098E-02	6.387E-02
Ag-108M	#B	-1.8848E-02	-1.8849E-02	5.8907E-02	5.8916E-02	6.639E-02
CD-109	#A	-4.4212E-02	-4.4284E-02	1.4342E+00	1.4342E+00	1.599E+00
SN-113	#B	-1.1303E-03	-1.1376E-03	4.4240E-01	4.4240E-01	6.258E-02
SB-125	#B	-1.0480E-02	-1.0488E-02	1.2992E-01	1.2992E-01	1.492E-01
I-131	#B	1.8891E-02	2.0710E-02	4.4096E-02	4.4111E-02	4.447E-02
CS-134	#B	2.3349E-02	2.3371E-02	2.2285E-02	2.2324E-02	1.132E-01
CS-137	#	1.0535E-01	1.0535E-01	7.6225E-02	7.6457E-02	
CE-139	#A	-1.0280E-02	-1.0336E-02	4.8259E-02	4.8263E-02	5.283E-02
EU-152	#B	-2.2654E-02	-2.2658E-02	1.1658E-01	1.1658E-01	1.302E-01
EU-154	#B	1.4609E-02	1.4612E-02	9.3118E-02	9.3122E-02	1.040E-01
EU-155	#B	4.4661E-02	4.4679E-02	1.4872E-01	1.4874E-01	1.648E-01
HG-203	#B	-3.3533E-03	-3.4069E-03	1.9585E+00	1.9585E+00	4.747E-02
TL-208		3.2516E-01	3.2516E-01	9.3568E-02	9.5355E-02	
PB-212	#	8.2469E-01	8.2469E-01	1.3962E-01	1.4719E-01	1.116E-01
PB-214	#	4.2044E-01	4.2044E-01	1.1785E-01	1.2022E-01	1.048E-01
BI-212	#	6.9029E-01	6.9029E-01	5.5044E-01	5.5182E-01	
BI-214		4.9234E-01	4.9234E-01	1.4336E-01	1.4603E-01	
RA-224	#A	8.0462E-01	8.0462E-01	1.2546E+00	1.2554E+00	1.372E+00
RA-226	#A	1.2526E+00	1.2526E+00	1.1852E+00	1.1873E+00	1.269E+00
AC-228		1.0270E+00	1.0270E+00	2.5045E-01	2.5708E-01	
TH-227	#B	-9.1983E-03	-9.1983E-03	4.4222E-01	4.4222E-01	4.970E-01
PA-234	#B	7.8703E-03	7.8703E-03	1.7321E-01	1.7321E-01	1.939E-01
TH-234	#B	8.5610E-01	8.5610E-01	1.0447E+00	1.0458E+00	2.325E+00
AM-241	#A	4.1056E-02	4.1056E-02	2.6068E-01	2.6069E-01	2.911E-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) 1.7557537E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 1.7557543E+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: 102F_13JUL2006_1545.An1

Sample description
FSS-OOL-14-01-008-F

Spectrum Filename: C:\GammaVision\Spectra\102F_13JUL2006_1545.An1

Acquisition information

Start time:	13-Jul-2006 15:45:17
Live time:	2000
Real time:	2014
Dead time:	0.71 %
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:	1.2040E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.2040E+03) = 8.3056E+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	13-Jul-2006 13:32:00
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: 0.7582

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
76.05	247.	14.64	1.25	9.226E-03	74.81	9.600	3.229E+00	PB212
					77.11	17.500	1.663E+00	PB212
					77.11	10.700	2.720E+00	PB214
129.37	54.	38.11	1.83	1.716E-02				
186.01	100.	21.81	1.28	1.627E-02	185.99	3.280	1.999E+00	RA226
209.18	69.	33.06	1.16	1.520E-02				
238.98	332.	6.59	1.21	1.379E-02	238.63	43.100	6.271E-01	PB212
295.58	79.	15.72	1.25	1.145E-02	295.22	19.200	4.040E-01	PB214
339.42	95.	17.01	1.17	1.003E-02	338.40	12.010	8.807E-01	AC228
352.49	152.	12.79	1.26	9.665E-03	351.99	37.100	4.755E-01	PB214
511.58	62.	19.06	1.27	6.695E-03	510.72	22.500	4.627E-01	TL208
584.20	82.	16.68	1.41	5.880E-03	583.14	86.000	1.806E-01	TL208
610.09	106.	14.21	1.82	5.643E-03	609.32	46.090	4.578E-01	BI214
662.62	126.	13.50	1.17	5.222E-03	661.62	84.620	3.196E-01	CS137
912.56	69.	15.84	1.78	3.916E-03	911.07	29.000	6.787E-01	AC228
969.70	68.	21.91	1.16	3.715E-03	968.90	17.460	1.172E+00	AC228
1462.70	351.	5.39	2.03	2.618E-03	1460.75	10.700	1.404E+01	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
258.34	129.37	161.	61.	0.030	96.61	1.828	AC-228	s
417.97	209.18	160.	69.	0.034	99.18	1.165	AC-228	s
477.59	238.90	74.	332.	0.166	19.76	1.215	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	153.80	77.11	528.	118.	0.059	87.28	1.500D
PB-214	153.80	77.11	528.	118.	0.059	87.28	1.500D
RA-226	371.89	186.14	167.	86.	0.043	67.38	1.500s
PB-212	477.46	238.92	195.	289.	0.145	27.02	1.500
PB-214	590.91	295.63	82.	75.	0.037	62.07	1.500s
AC-228	678.51	339.42	61.	95.	0.047	51.03	1.166s
PB-214	704.56	352.44	71.	128.	0.064	38.41	1.500
TL-208	1022.94	511.58	29.	62.	0.031	57.19	1.270s
TL-208	1168.24	584.20	37.	81.	0.041	50.04	1.414
BI-214	1220.03	610.09	37.	106.	0.053	42.62	1.818s
CS-137	1325.13	662.62	48.	126.	0.063	40.49	1.171s
AC-228	1825.26	912.56	18.	69.	0.034	47.51	1.782
AC-228	1939.60	969.70	31.	68.	0.034	65.73	1.157s
K-40	2926.30	1462.70	2.	351.	0.175	16.16	2.034

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		1.4819E-01					
			477.56	1.482E-01	&(	5.293E-01 1.56E-01 G	
K-40		1.4039E+01					
			1460.75	1.404E+01	(P	3.883E-01 7.57E-01 G	
MN-54		2.1614E-02					
			834.81	2.161E-02	%(P	7.229E-02 2.11E-02 G	
CO-57		-3.5348E-03					
			122.07	-3.535E-03	%(	5.406E-02 1.59E-02 G	K
			136.43	-1.856E-03	%	4.365E-01 1.27E-01 G	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-60	-8.5774E-03						
		1332.51	-8.577E-03	%(P	8.147E-02	2.22E-02	G K
		1173.23	-5.795E-03	%	1.162E-01	3.27E-02	G K
Sr-85	-2.2858E-02						
		514.00	-2.286E-02	&(	8.210E-02	2.43E-02	G
Kr-85	-5.2729E+02						
		513.99	-5.273E+02	&(	1.894E+03	5.61E+02	G
Y-88	-3.4529E-05						
		1836.01	-3.453E-05	%(P	3.877E-02	5.26E-03	G K
		898.02	1.064E-02	& P	7.312E-02	2.04E-02	G
NB-94	-4.6541E-03						
		871.10	-4.654E-03	%(	6.486E-02	1.78E-02	G K
		702.50	1.591E-02	%	5.771E-02	1.68E-02	G K
Ag-108M	-1.4322E-02						
		722.95	-1.432E-02	%(	8.043E-02	2.31E-02	G K
		614.37	-4.466E-02	& P	9.298E-02	2.82E-02	G
		433.93	1.767E-02	&	4.673E-02	1.39E-02	G
CD-109	1.3072E+00						
		88.04	1.307E+00	%(P	2.666E+00	8.08E-01	G
SN-113	5.1560E-03						
		391.71	5.156E-03	%(	7.167E-02	2.04E-02	G K
		255.04	-1.756E-01	&	2.450E+00	7.14E-01	G
SB-125	-9.8205E-03						
		427.95	-9.821E-03	%(P	1.646E-01	4.58E-02	G K
		600.77	-8.427E-03	% P	2.794E-01	7.63E-02	G
		636.15	2.267E-03	% P	5.113E-01	1.40E-01	G
		463.51	2.388E-01	% P	5.563E-01	1.66E-01	G
		176.29	-8.848E-02	% P	6.737E-01	1.96E-01	G
I-131	2.2404E-02						
		364.48	2.240E-02	%(	4.910E-02	1.48E-02	G K
		636.97	-1.449E-01	&	8.612E-01	2.46E-01	G
		284.29	2.412E-01	%	6.331E-01	1.89E-01	G
CS-134	-2.2322E-04						
		604.66	-2.232E-04	%(	6.049E-02	1.67E-02	G K
		795.76	4.045E-02	%	7.035E-02	2.19E-02	G
		569.29	6.113E-02	%	2.906E-01	8.28E-02	G
		801.84	-7.777E-02	% P	7.276E-01	2.02E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-137	3.1958E-01						
		661.62	3.196E-01	@(	8.876E-02	4.32E-02	G
CE-139	-5.6258E-04						
		165.85	-5.626E-04	&(P	4.655E-02	1.34E-02	G
EU-152	-1.9928E-02						
		121.78	-1.993E-02	%(P	1.801E-01	5.31E-02	G K
		344.30	-4.901E-02	%	2.004E-01	5.91E-02	G
		1408.08	4.187E-03	%	3.133E-01	7.95E-02	G
		964.00	-1.108E-02	% P	5.247E-01	1.42E-01	G
		1112.07	-1.255E-01	%	6.751E-01	1.93E-01	G
		778.90	-9.195E-02	& P	5.275E-01	1.50E-01	G
EU-154	-1.4401E-02						
		123.10	-1.440E-02	&(P	1.193E-01	3.52E-02	G K
		1274.80	0.000E+00	%	2.383E-01	6.35E-02	G
		723.30	-8.240E-02	% P	4.001E-01	1.16E-01	G
		1004.80	3.447E-03	&	4.230E-01	1.14E-01	G
EU-155	-1.3594E-02						
		86.45	-1.359E-02	%(P	3.387E-01	1.00E-01	G K
		105.31	-3.915E-02	%	2.914E-01	8.64E-02	G
HG-203	-8.4103E-04						
		279.17	-8.410E-04	%(P	5.807E-02	1.67E-02	G K
		72.87	-6.812E-02	%	2.920E+00	8.69E-01	G
		70.83	-1.799E-01	%	5.326E+00	1.58E+00	G
		82.50	2.256E-01	%	4.715E+00	1.40E+00	G
TL-208	1.8057E-01						
		583.14	1.806E-01	(P	6.839E-02	3.03E-02	G
		510.72	4.627E-01	+	2.069E-01	8.83E-02	G
PB-212	5.4546E-01						
		238.63	5.455E-01	(	1.277E-01	4.91E-02	G K
							Energy duplication
		77.11	7.916E-01	+	7.380E-01	2.30E-01	G
		74.81	1.051E+00	& P	1.481E+00	4.53E-01	G
PB-214	3.9350E-01						
		351.99	4.001E-01	(P	1.315E-01	5.14E-02	G K
		295.22	3.807E-01	@(	2.290E-01	7.88E-02	G
							Energy duplication
		77.11	1.295E+00	+	1.207E+00	3.77E-01	G
		241.92	2.728E-01	%	8.571E-01	2.57E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-212	3.6854E-01						
		727.17	3.685E-01	%(	5.252E-01	1.67E-01	G K
		1620.56	-2.918E-01	% P	2.501E+00	6.35E-01	G
		785.42	-7.097E-01	% P	3.534E+00	1.01E+00	G
BI-214	4.5779E-01						
		609.32	4.578E-01	@(	1.335E-01	6.51E-02	G K
		1764.51	-8.295E-02	% P	5.270E-01	1.42E-01	G
		1120.28	2.768E-01	%	5.536E-01	1.69E-01	G
RA-224	7.6134E-01						
		241.00	7.613E-01	%(P	1.574E+00	4.77E-01	G
RA-226	1.8154E+00						
		185.99	1.815E+00	*(P	1.323E+00	4.29E-01	G
AC-228	7.3782E-01						
		911.07	6.787E-01	(P	2.231E-01	1.08E-01	G K
		968.90	1.172E+00	+ P	4.972E-01	2.57E-01	G
		338.40	8.807E-01	*(	3.638E-01	1.50E-01	G
TH-227	-1.1606E-01						
		236.00	-1.161E-01	&(P	5.476E-01	1.63E-01	G K
		256.25	-4.240E-02	&	7.323E-01	2.13E-01	G
PA-234	-9.0409E-02						
		98.44	-9.041E-02	%(	2.887E-01	8.67E-02	G K
		946.00	-1.876E-02	&	3.648E-01	9.99E-02	G
		131.28	-3.148E-02	&	2.662E-01	7.88E-02	G
		94.67	-1.127E-02	%	5.634E-01	1.67E-01	G
		883.24	0.000E+00	%	4.129E-01	1.06E-01	G
		926.70	6.301E-02	%	6.360E-01	1.76E-01	G
		569.26	9.077E-02	%	4.310E-01	1.23E-01	G
TH-234	2.0441E+00						
		63.29	2.044E+00	%(P	5.788E+00	1.74E+00	G K
		92.80	-2.354E-02	%	2.979E+00	8.81E-01	G
		92.38	-1.166E+00	& P	3.657E+00	1.10E+00	G
AM-241	-2.3886E-01						
		59.54	-2.389E-01	%(	8.915E-01	2.67E-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.
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Nuclide Codes:
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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	1.4802E-01	1.4819E-01	4.6655E-01	4.6663E-01	5.286E-01
K-40		1.4039E+01	1.4039E+01	2.2701E+00	2.4029E+00	
MN-54	#A	2.1609E-02	2.1614E-02	6.3370E-02	6.3382E-02	7.228E-02
CO-57	#B	-3.5340E-03	-3.5348E-03	4.7561E-02	4.7561E-02	5.405E-02
CO-60	#B	-8.5771E-03	-8.5774E-03	7.1442E-02	7.1443E-02	8.147E-02
Sr-85	#A	-2.2836E-02	-2.2858E-02	7.2992E-02	7.3004E-02	8.202E-02
Kr-85	#A	-5.2729E+02	-5.2729E+02	1.6834E+03	1.6837E+03	1.894E+03
Y-88	#B	-3.4509E-05	-3.4529E-05	2.0718E-04	2.0719E-04	3.875E-02
NB-94	#B	-4.6541E-03	-4.6541E-03	5.3357E-02	5.3357E-02	6.486E-02
Ag-108M	#B	-1.4322E-02	-1.4322E-02	6.9309E-02	6.9313E-02	8.043E-02
CD-109	#A	1.3070E+00	1.3072E+00	2.4253E+00	2.4264E+00	2.666E+00
SN-113	#B	5.1531E-03	5.1560E-03	6.1059E-02	6.1060E-02	7.163E-02
SB-125	#B	-9.8199E-03	-9.8205E-03	3.9571E-01	3.9571E-01	1.646E-01
I-131	#B	2.2226E-02	2.2404E-02	4.4541E-02	4.4558E-02	4.871E-02
CS-134	#B	-2.2320E-04	-2.2322E-04	5.0125E-02	5.0125E-02	6.048E-02
CS-137	#	3.1958E-01	3.1958E-01	1.2940E-01	1.3064E-01	
CE-139	#A	-5.6232E-04	-5.6258E-04	1.8408E-01	1.8408E-01	4.653E-02
EU-152	#B	-1.9928E-02	-1.9928E-02	1.9477E-01	1.9478E-01	1.801E-01
EU-154	#B	-1.4401E-02	-1.4401E-02	1.1058E-01	1.1058E-01	1.193E-01
EU-155	#B	-1.3593E-02	-1.3594E-02	2.7494E+00	2.7494E+00	3.387E-01

HG-203 #B	-8.3987E-04	-8.4103E-04	6.4527E-02	6.4527E-02	5.799E-02

TL-208		1.8057E-01	1.8057E-01	9.0802E-02	9.1366E-02	
PB-212	#	5.4546E-01	5.4546E-01	1.4738E-01	1.5052E-01	1.277E-01
PB-214	#	3.9350E-01	3.9350E-01	1.4374E-01	1.4542E-01	1.315E-01
BI-212	#B	3.6854E-01	3.6854E-01	5.0000E-01	5.0043E-01	5.252E-01
BI-214	#	4.5779E-01	4.5779E-01	1.9511E-01	1.9680E-01	
RA-224	#A	7.6134E-01	7.6134E-01	1.4304E+00	1.4311E+00	1.574E+00
RA-226	#	1.8154E+00	1.8154E+00	1.2863E+00	1.2903E+00	1.323E+00
AC-228		7.3782E-01	7.3782E-01	2.5761E-01	2.6092E-01	
TH-227	#B	-1.1606E-01	-1.1606E-01	5.0571E-01	5.0575E-01	5.476E-01
PA-234	#B	-9.0409E-02	-9.0409E-02	2.6009E-01	2.6014E-01	2.887E-01
TH-234	#B	2.0441E+00	2.0441E+00	5.2274E+00	5.2286E+00	5.788E+00
AM-241	#A	-2.3886E-01	-2.3886E-01	8.0171E-01	8.0182E-01	8.915E-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) 1.5734486E+01 pCi/gm
Total Decayed Activity (295.2 to 1999.0 keV) 1.5734488E+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_13JUL2006_1626.An1

Sample description
FSS-OOL-14-01-005-F

Spectrum Filename: C:\GammaVision\Spectra\102F_13JUL2006_1626.An1

Acquisition information
Start time: 13-Jul-2006 16:26:52
Live time: 2000
Real time: 2013
Dead time: 0.66 %
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: 9.2300E+02
Activity scaling factor: 1.0000E+06/(1.0000E+00* 9.2300E+02) =
1.0834E+03
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

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

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

Corrections	Status	Comments
Decay correct to date:	YES	12-Jul-2006 14:05:00
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: 0.6473

***** 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
77.09	80.	41.67	1.50	9.541E-03	77.11	10.700	PBC<MDA	PB214
					77.11	17.500	6.993E-01	PB212
77.09	80.	41.67	1.50	9.541E-03	77.11	10.700	1.144E+00	PB214
					77.11	17.500	6.993E-01	PB212
92.71	72.	31.64	1.11	1.328E-02				
92.71	72.	31.64	1.11	1.328E-02	92.80	3.000	2.652E+00	TH234
186.39	61.	33.34	1.43	1.625E-02	185.99	3.280	PBC<MDA	RA226
210.01	42.	36.90	1.40	1.516E-02				
239.13	334.	8.71	1.17	1.378E-02	238.63	43.100	8.229E-01	PB212
242.23	49.	38.90	1.50	1.370E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	PBC<MDA	PB214
295.68	97.	21.60	1.23	1.145E-02	295.22	19.200	6.451E-01	PB214
339.11	92.	17.93	1.51	1.004E-02	338.40	12.010	1.115E+00	AC228
352.35	147.	13.17	1.26	9.669E-03	351.99	37.100	5.978E-01	PB214
511.85	64.	22.55	1.48	6.680E-03	510.72	22.500	6.201E-01	TL208
583.67	104.	12.60	1.14	5.885E-03	583.14	86.000	3.003E-01	TL208
610.27	91.	16.63	1.63	5.641E-03	609.32	46.090	5.128E-01	BI214
662.65	284.	7.03	1.37	5.222E-03	661.62	84.620	9.380E-01	CS137
912.24	48.	17.83	1.32	3.918E-03	911.07	29.000	6.214E-01	AC228
969.88	47.	20.16	0.96	3.715E-03	968.90	17.460	1.055E+00	AC228
1120.95	35.	21.30	1.64	3.283E-03	1120.28	15.040	1.032E+00	BI214
1462.68	308.	5.70	2.01	2.618E-03	1460.75	10.700	1.607E+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
185.00	92.56	227.	72.	0.036	94.93	1.111	TH-234 lD
419.64	210.01	92.	42.	0.021	110.70	1.401	NP-239
477.89	239.13	416.	79.	0.040	114.34	1.165	PB-212

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

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	512.	80.	0.040	125.00	1.500D
PB-212	153.80	77.11	512.	80.	0.040	125.00	1.500D
RA-226	372.21	186.30	174.	62.	0.031	90.76	1.500s
PB-212	477.53	238.95	201.	205.	0.102	36.05	1.500
RA-224	484.10	242.23	168.	49.	0.025	116.71	1.500s
PB-214	590.78	295.56	98.	83.	0.042	60.28	1.500
AC-228	677.89	339.11	60.	92.	0.046	53.78	1.506s
PB-214	704.49	352.40	47.	119.	0.059	36.69	1.500
TL-208	1022.67	511.45	48.	40.	0.020	87.56	1.500
TL-208	1167.94	584.05	27.	75.	0.037	45.24	1.499s
BI-214	1220.39	610.27	41.	91.	0.046	49.88	1.631
CS-137	1325.20	662.65	34.	284.	0.142	21.09	1.366
AC-228	1824.62	912.24	11.	48.	0.024	53.48	1.319
AC-228	1939.96	969.88	13.	47.	0.023	60.49	0.963s
BI-214	2242.29	1120.95	7.	35.	0.017	63.91	1.636s
K-40	2926.33	1462.71	14.	280.	0.140	18.78	2.042s

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

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

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		-1.4265E-01					
			477.56	-1.426E-01	%(	6.557E-01 1.90E-01	G
K-40		1.4621E+01					
			1460.75	1.462E+01	?(P	1.047E+00 9.16E-01	G
MN-54		-1.4682E-02					
			834.81	-1.468E-02	%(P	9.112E-02 2.57E-02	G
CO-57		-3.4789E-03					
			122.07	-3.479E-03	%(	6.857E-02 2.01E-02	G K
			136.43	-7.407E-02	&	5.330E-01 1.57E-01	G
CO-60		-1.6610E-02					
			1332.51	-1.661E-02	&(P	1.001E-01 2.76E-02	G K
			1173.23	-7.652E-03	&	9.576E-02 2.59E-02	G K
Sr-85		1.3936E-02					
			514.00	1.394E-02	%(	7.421E-02 2.14E-02	G
Kr-85		3.1796E+02					
			513.99	3.180E+02	%(	1.693E+03 4.89E+02	G
Y-88		1.6660E-02					
			1836.01	1.666E-02	%(P	7.091E-02 1.91E-02	G K
			898.02	-1.038E-02	% P	1.039E-01 2.85E-02	G
NB-94		-7.6879E-03					
			871.10	-7.688E-03	&(	7.503E-02 2.05E-02	G K
			702.50	6.398E-03	%	7.089E-02 1.96E-02	G K
Ag-108M		-1.5383E-02					
			722.95	-1.538E-02	%(	8.919E-02 2.53E-02	G K
			614.37	-2.725E-02	% P	1.117E-01 3.27E-02	G
			433.93	1.076E-02	&	6.669E-02 1.91E-02	G
CD-109		1.0364E+00					
			88.04	1.036E+00	%(P	3.390E+00 1.02E+00	G
SN-113		-1.8871E-02					
			391.71	-1.887E-02	&(	1.040E-01 3.02E-02	G K
			255.04	-3.493E-01	%	2.640E+00 7.69E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-1.2455E-02						
		427.95	-1.245E-02	&(P	2.259E-01	6.32E-02	G K
		600.77	6.477E-03	% P	3.176E-01	8.53E-02	G
		636.15	-1.650E-03	% P	7.403E-01	2.05E-01	G
		463.51	2.711E-01	% P	6.396E-01	1.91E-01	G
		176.29	3.359E-01	& P	7.898E-01	2.37E-01	G
I-131	4.3179E-04						
		364.48	4.318E-04	&(	7.366E-02	2.06E-02	G K
		636.97	-9.665E-02	%	9.727E-01	2.69E-01	G
		284.29	-2.352E-01	%	1.082E+00	3.18E-01	G
CS-134	4.9424E-04						
		604.66	4.942E-04	&(	7.332E-02	2.01E-02	G K
		795.76	2.657E-02	%	8.833E-02	2.57E-02	G
		569.29	-3.464E-02	%	4.100E-01	1.14E-01	G
		801.84	1.677E-01	& P	7.586E-01	2.14E-01	G
CS-137	9.3804E-01						
		661.62	9.380E-01	(	9.953E-02	6.61E-02	G
CE-139	2.9912E-04						
		165.85	2.991E-04	%(P	6.666E-02	1.93E-02	G
EU-152	-3.5457E-02						
		121.78	-3.546E-02	%(P	2.089E-01	6.16E-02	G K
		344.30	5.529E-05	%	2.115E-01	5.97E-02	G
		1408.08	-6.677E-02	&	4.978E-01	1.36E-01	G
		964.00	-1.071E-01	& P	7.207E-01	2.03E-01	G
		1112.07	-9.377E-02	%	7.208E-01	2.00E-01	G
		778.90	-1.275E-01	% P	6.652E-01	1.90E-01	G
EU-154	5.2473E-03						
		123.10	5.247E-03	%(P	1.296E-01	3.77E-02	G K
		1274.80	-6.984E-02	%	3.716E-01	1.06E-01	G
		723.30	-8.441E-02	% P	4.242E-01	1.21E-01	G
		1004.80	0.000E+00	%	5.852E-01	1.59E-01	G
EU-155	-2.2118E-01						
		86.45	-2.212E-01	%(P	4.305E-01	1.30E-01	G K
		105.31	1.398E-01	%	3.145E-01	9.51E-02	G
HG-203	-2.6661E-03						
		279.17	-2.666E-03	%(P	5.344E-02	1.51E-02	G K
		72.87	-4.951E-01	%	2.888E+00	8.61E-01	G
		70.83	-1.663E+00	&	6.143E+00	1.84E+00	G
		82.50	9.914E-01	&	6.180E+00	1.84E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.1594E-01						
		583.14	2.159E-01	@(P	7.782E-02	3.27E-02	G
		510.72	3.878E-01	+	3.396E-01	1.13E-01	G
PB-212	5.0415E-01						
		238.63	5.041E-01	(	1.691E-01	6.06E-02	G K
							Energy duplication
		77.11	6.993E-01	+	9.485E-01	2.91E-01	G
		74.81	8.571E-01	% P	1.830E+00	5.54E-01	G
PB-214	5.0748E-01						
		351.99	4.833E-01	(P	1.409E-01	5.93E-02	G K
		295.22	5.542E-01	(	3.256E-01	1.11E-01	G
							Energy duplication
		77.11	1.144E+00	+	1.551E+00	4.77E-01	G
		241.92	6.286E-01	&	9.716E-01	2.99E-01	G
BI-212	2.8556E-02						
		727.17	2.856E-02	%(	4.879E-01	1.30E-01	G K
		1620.56	-7.453E-02	% P	1.637E+00	2.22E-01	G
		785.42	-4.052E-02	% P	4.231E+00	1.15E+00	G
BI-214	5.1282E-01						
		609.32	5.128E-01	(	1.826E-01	8.54E-02	G K
		1764.51	-3.582E-03	% P	6.930E-01	1.75E-01	G
		1120.28	1.032E+00	+	4.511E-01	2.20E-01	G
RA-224	1.3480E+00						
		241.00	1.348E+00	&(P	1.729E+00	5.37E-01	G
RA-226	1.7064E+00						
		185.99	1.706E+00	(P	1.763E+00	5.53E-01	G
AC-228	6.2138E-01						
		911.07	6.214E-01	(P	2.314E-01	1.11E-01	G K
		968.90	1.055E+00	+ P	4.435E-01	2.13E-01	G
		338.40	1.115E+00	+	4.703E-01	2.00E-01	G
TH-227	-2.6781E-03						
		236.00	-2.678E-03	%(P	7.750E-01	2.27E-01	G K
		256.25	-2.418E-01	%	8.524E-01	2.53E-01	G
PA-234	-1.1256E-01						
		98.44	-1.126E-01	%(	3.763E-01	1.13E-01	G K
		946.00	-5.382E-02	%	4.002E-01	1.10E-01	G
		131.28	1.204E-02	%	3.095E-01	9.07E-02	G
		94.67	-1.038E-01	%	7.277E-01	2.17E-01	G
		883.24	-2.340E-02	%	5.327E-01	1.39E-01	G
		926.70	2.243E-01	%	6.321E-01	1.86E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-4.711E-02 %   6.076E-01 1.68E-01 G

TH-234       2.2189E+00
                           63.29 2.219E+00 %(P 7.125E+00 2.14E+00 G K
                           92.80 2.531E+00 %   3.903E+00 1.19E+00 G
                           92.38-2.463E-01 % P 4.602E+00 1.36E+00 G

AM-241       2.1288E-02
                           59.54 2.129E-02 %(  8.899E-01 2.61E-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	-1.4063E-01	-1.4265E-01	5.7035E-01	5.7041E-01	6.464E-01
K-40	#	1.4621E+01	1.4621E+01	2.7469E+00	2.8669E+00	1.047E+00
MN-54	#A	-1.4646E-02	-1.4682E-02	8.5141E-02	8.5145E-02	9.090E-02
CO-57	#B	-3.4691E-03	-3.4789E-03	6.0182E-02	6.0182E-02	6.838E-02
CO-60	#B	-1.6604E-02	-1.6610E-02	8.6909E-02	8.6914E-02	1.000E-01

Sr-85	#A	1.3773E-02	1.3936E-02	6.4253E-02	6.4258E-02	7.334E-02
Kr-85	#A	3.1796E+02	3.1796E+02	1.4660E+03	1.4661E+03	1.693E+03
Y-88	#B	1.6542E-02	1.6660E-02	5.7364E-02	5.7372E-02	7.041E-02
NB-94	#B	-7.6879E-03	-7.6879E-03	6.1511E-02	6.1513E-02	7.503E-02
Ag-108M	#B	-1.5383E-02	-1.5383E-02	7.6041E-02	7.6046E-02	8.919E-02
CD-109	#A	1.0347E+00	1.0364E+00	3.0553E+00	3.0559E+00	3.385E+00
SN-113	#B	-1.8747E-02	-1.8871E-02	9.0642E-02	9.0648E-02	1.033E-01
SB-125	#B	-1.2445E-02	-1.2455E-02	5.6623E-01	5.6623E-01	2.258E-01
I-131	#B	3.9277E-04	4.3179E-04	6.1898E-02	6.1898E-02	6.700E-02
CS-134	#B	4.9374E-04	4.9424E-04	6.0336E-02	6.0336E-02	7.324E-02
CS-137		9.3797E-01	9.3804E-01	1.9787E-01	2.0475E-01	
CE-139	#A	2.9747E-04	2.9912E-04	5.8009E-02	5.8009E-02	6.629E-02
EU-152	#B	-3.5451E-02	-3.5457E-02	2.1425E-01	2.1426E-01	2.089E-01
EU-154	#B	5.2460E-03	5.2473E-03	1.1309E-01	1.1309E-01	1.295E-01
EU-155	#B	-2.2109E-01	-2.2118E-01	4.4422E-01	4.4439E-01	4.303E-01
HG-203	#B	-2.6229E-03	-2.6661E-03	5.0288E-02	5.0288E-02	5.258E-02
TL-208	#	2.1594E-01	2.1594E-01	9.8221E-02	9.8965E-02	7.782E-02
PB-212	#	5.0415E-01	5.0415E-01	1.8175E-01	1.8394E-01	1.691E-01
PB-214	#	5.0748E-01	5.0748E-01	1.7921E-01	1.8146E-01	1.409E-01
BI-212	#B	2.8556E-02	2.8556E-02	3.8902E-01	3.8902E-01	4.879E-01
BI-214		5.1282E-01	5.1282E-01	2.5579E-01	2.5740E-01	
RA-224	#A	1.3480E+00	1.3480E+00	1.6104E+00	1.6122E+00	1.729E+00
RA-226	#A	1.7064E+00	1.7064E+00	1.6599E+00	1.6627E+00	1.763E+00
AC-228		6.2138E-01	6.2138E-01	3.3389E-01	3.3570E-01	
TH-227	#B	-2.6781E-03	-2.6781E-03	3.8921E-01	3.8921E-01	7.750E-01
PA-234	#B	-1.1256E-01	-1.1256E-01	3.3866E-01	3.3871E-01	3.763E-01
TH-234	#B	2.2189E+00	2.2189E+00	6.4161E+00	6.4173E+00	7.125E+00
AM-241	#A	2.1288E-02	2.1288E-02	7.8291E-01	7.8291E-01	8.899E-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) 1.6693316E+01 pCi/gm
Total Decayed Activity (50.2 to 1999.0 keV) 1.6693380E+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_13JUL2006_1704.An1

Sample description
FSS-OOL-14-01-019-F-B

Spectrum Filename: C:\GammaVision\Spectra\102F_13JUL2006_1704.An1

Acquisition information
Start time: 13-Jul-2006 17:04:22
Live time: 2000
Real time: 2015
Dead time: 0.76 %
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: 1.4650E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4650E+03) =
6.8259E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

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

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

Corrections	Status	Comments
Decay correct to date:	YES	11-Jul-2006 11:40:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6740

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.19	120.	30.59	1.50	9.541E-03	77.11	10.700	1.083E+00	PB214
					77.11	17.500	6.619E-01	PB212
77.19	120.	30.59	1.50	9.541E-03	77.11	10.700	1.083E+00	PB214
					77.11	17.500	6.619E-01	PB212
92.86	107.	34.14	1.35	1.334E-02	92.80	3.000	2.468E+00	TH234
186.19	104.	23.20	1.27	1.626E-02	185.99	3.280	1.714E+00	RA226
209.78	58.	38.57	1.44	1.517E-02				
238.91	481.	7.46	1.36	1.379E-02	238.63	43.100	7.463E-01	PB212
295.34	98.	19.56	1.68	1.146E-02	295.22	19.200	4.086E-01	PB214
328.57	47.	38.94	0.88	1.035E-02				
338.78	88.	24.30	0.94	1.005E-02	338.40	12.010	6.749E-01	AC228
352.48	131.	11.35	1.21	9.665E-03	351.99	37.100	3.355E-01	PB214
511.50	67.	21.33	1.57	6.685E-03	510.72	22.500	4.097E-01	TL208
583.98	131.	10.52	1.07	5.882E-03	583.14	86.000	2.371E-01	TL208
610.20	116.	11.90	1.38	5.642E-03	609.32	46.090	4.117E-01	BI214
662.83	79.	16.93	1.27	5.221E-03	661.62	84.620	1.643E-01	CS137
728.05	56.	29.69	1.38	4.789E-03	727.17	11.800	9.131E-01	BI212
912.40	74.	13.60	1.64	3.917E-03	911.07	29.000	5.967E-01	AC228
969.88	63.	20.79	1.99	3.718E-03	968.90	17.460	8.990E-01	AC228
1121.59	50.	21.23	1.60	3.283E-03	1120.28	15.040	9.378E-01	BI214
1462.69	332.	5.76	2.13	2.618E-03	1460.75	10.700	1.091E+01	K40
1766.62	21.	21.82	2.33	2.225E-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
185.29	92.86	472.	107.	0.054	102.41	1.347	TH-234 l
419.18	209.78	177.	58.	0.029	115.72	1.440	NP-239 s
477.44	238.91	596.	123.	0.062	88.29	1.359	PB-212
656.81	328.57	101.	47.	0.024	116.83	0.878	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-214	153.80	77.11	612.	120.	0.060	91.76	1.500D
PB-212	153.80	77.11	612.	120.	0.060	91.76	1.500D
RA-226	371.99	186.19	193.	84.	0.042	72.84	1.500s
PB-212	477.52	238.95	231.	361.	0.180	23.86	1.500
PB-214	590.51	295.43	118.	85.	0.043	62.99	1.500s
AC-228	677.33	338.83	108.	102.	0.051	63.05	0.956
PB-214	704.64	352.48	62.	134.	0.067	35.72	1.500
TL-208	1022.78	511.50	44.	67.	0.033	63.99	1.573s
TL-208	1167.79	583.98	23.	130.	0.065	31.57	1.072
BI-214	1220.26	610.20	29.	116.	0.058	35.69	1.380
CS-137	1325.56	662.83	34.	79.	0.039	50.79	1.270
BI-212	1456.06	728.05	49.	56.	0.028	89.08	1.375
AC-228	1824.95	912.40	11.	74.	0.037	40.79	1.636s
AC-228	1939.97	969.88	30.	63.	0.032	62.37	1.988
BI-214	2243.57	1121.59	20.	50.	0.025	63.68	1.601
K-40	2926.37	1462.73	10.	313.	0.157	17.45	2.042
BI-214	3534.71	1766.62	0.	21.	0.010	65.47	2.331

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		1.4751E-02					
			477.56	1.475E-02	%(	3.558E-01 9.84E-02	G
K-40		1.0312E+01					
			1460.75	1.031E+01	(P	5.682E-01 6.00E-01	G
MN-54		-1.1391E-02					
			834.81	-1.139E-02	%(P	6.431E-02 1.83E-02	G
CO-57		1.0863E-02					
			122.07	1.086E-02	&(	5.271E-02 1.57E-02	G K
			136.43	-2.552E-02	%	4.520E-01 1.34E-01	G
CO-60		6.3571E-04					
			1332.51	6.357E-04	%(P	6.862E-02 1.82E-02	G K
			1173.23	-1.159E-02	&	9.000E-02 2.56E-02	G K
Sr-85		-1.4290E-02					
			514.00	-1.429E-02	%(	6.375E-02 1.87E-02	G
Kr-85		-3.2183E+02					
			513.99	-3.218E+02	%(	1.437E+03 4.22E+02	G
Y-88		-8.4454E-03					
			1836.01	-8.445E-03	%(P	7.112E-02 1.90E-02	G K
			898.02	-1.013E-02	% P	5.884E-02 1.62E-02	G
NB-94		5.0135E-04					
			871.10	5.014E-04	%(	5.615E-02 1.52E-02	G K
			702.50	2.949E-04	%	5.310E-02 1.46E-02	G K
Ag-108M		-4.0591E-04					
			722.95	-4.059E-04	&(	5.457E-02 1.49E-02	G K
			614.37	-3.298E-02	% P	7.784E-02 2.34E-02	G
			433.93	4.211E-03	%	5.100E-02 1.46E-02	G
CD-109		-9.2530E-02					
			88.04	-9.253E-02	%(P	2.415E+00 7.17E-01	G
SN-113		0.0000E+00					
			391.71	0.000E+00	%(	7.565E-02 2.16E-02	G K
			255.04	-4.422E-01	%	2.211E+00 6.54E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.2551E-02						
		427.95	1.255E-02	%(P	1.569E-01	4.48E-02	G K
		600.77	-3.438E-02	& P	2.718E-01	7.70E-02	G
		636.15	4.330E-02	& P	3.872E-01	1.08E-01	G
		463.51	3.045E-01	% P	4.327E-01	1.35E-01	G
		176.29	1.029E-01	% P	5.742E-01	1.69E-01	G
I-131	1.0449E-02						
		364.48	1.045E-02	&(	5.302E-02	1.54E-02	G K
		636.97	3.005E-02	&	7.462E-01	2.05E-01	G
		284.29	1.379E-01	&	7.606E-01	2.23E-01	G
CS-134	-2.9173E-03						
		604.66	-2.917E-03	%(	4.739E-02	1.32E-02	G K
		795.76	1.653E-02	%	5.955E-02	1.73E-02	G
		569.29	6.658E-02	&	2.666E-01	7.71E-02	G
		801.84	2.999E-02	% P	6.309E-01	1.74E-01	G
CS-137	1.6428E-01						
		661.62	1.643E-01	(	6.246E-02	2.79E-02	G
CE-139	-3.7102E-03						
		165.85	-3.710E-03	%(P	5.006E-02	1.47E-02	G
EU-152	2.4952E-02						
		121.78	2.495E-02	&(P	1.605E-01	4.76E-02	G K
		344.30	3.656E-02	%	1.306E-01	3.85E-02	G
		1408.08	1.960E-02	%	2.785E-01	7.35E-02	G
		964.00	-3.515E-04	& P	4.563E-01	1.24E-01	G
		1112.07	1.181E-01	&	4.827E-01	1.39E-01	G
		778.90	-3.396E-02	% P	3.987E-01	1.10E-01	G
EU-154	-2.4873E-02						
		123.10	-2.487E-02	%(P	1.225E-01	3.65E-02	G K
		1274.80	-1.556E-02	&	1.964E-01	5.36E-02	G
		723.30	-3.039E-03	& P	2.968E-01	8.19E-02	G
		1004.80	-1.876E-02	&	3.268E-01	8.88E-02	G
EU-155	-1.6489E-02						
		86.45	-1.649E-02	%(P	2.797E-01	8.28E-02	G K
		105.31	3.950E-03	%	2.669E-01	7.88E-02	G
HG-203	5.5260E-05						
		279.17	5.526E-05	%(P	5.305E-02	1.53E-02	G K
		72.87	3.306E-01	%	1.840E+00	5.49E-01	G
		70.83	1.907E-01	&	4.823E+00	1.44E+00	G
		82.50	-8.220E-02	%	4.658E+00	1.38E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.3709E-01						
		583.14	2.371E-01	(P	4.546E-02	2.51E-02	G
		510.72	4.097E-01	+	2.061E-01	8.75E-02	G
PB-212	5.8889E-01						
		238.63	5.592E-01	(	1.141E-01	4.45E-02	G K
							Energy duplication
		77.11	6.619E-01	*(	6.517E-01	2.02E-01	G
		74.81	8.680E-01	& P	1.320E+00	4.03E-01	G
PB-214	3.4924E-01						
		351.99	3.451E-01	(P	1.010E-01	4.12E-02	G K
		295.22	3.572E-01	(	2.231E-01	7.50E-02	G
							Energy duplication
		77.11	1.083E+00	+	1.066E+00	3.31E-01	G
		241.92	-1.859E-03	%	6.860E-01	2.01E-01	G
BI-212	9.1313E-01						
		727.17	9.131E-01	(	5.761E-01	2.72E-01	G K
		1620.56	1.304E-02	% P	2.071E+00	5.09E-01	G
		785.42	6.171E-01	% P	2.642E+00	7.60E-01	G
BI-214	4.4577E-01						
		609.32	4.117E-01	(	9.820E-02	4.90E-02	G K
		1764.51	5.445E-01	(P	1.919E-01	1.19E-01	G
		1120.28	9.378E-01	+	4.380E-01	1.99E-01	G
RA-224	-6.3719E-02						
		241.00	-6.372E-02	&(P	1.338E+00	3.92E-01	G
RA-226	1.4596E+00						
		185.99	1.460E+00	*(P	1.166E+00	3.73E-01	G
AC-228	6.4978E-01						
		911.07	5.967E-01	*(P	1.497E-01	8.15E-02	G K
		968.90	8.990E-01	+ P	3.996E-01	1.87E-01	G
		338.40	7.780E-01	(	3.906E-01	1.64E-01	G
TH-227	-1.3418E-01						
		236.00	-1.342E-01	%(P	5.113E-01	1.53E-01	G K
		256.25	-2.219E-02	&	6.625E-01	1.93E-01	G
PA-234	-6.8660E-02						
		98.44	-6.866E-02	%(	2.723E-01	8.16E-02	G K
		946.00	2.295E-02	%	2.932E-01	8.07E-02	G
		131.28	-4.827E-02	%	2.572E-01	7.67E-02	G
		94.67	-8.122E-02	%	5.047E-01	1.51E-01	G
		883.24	-3.228E-02	&	5.183E-01	1.44E-01	G
		926.70	3.004E-04	%	4.345E-01	1.14E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 9.826E-02 &   3.950E-01 1.14E-01 G

TH-234      -1.6626E-02
                           63.29-1.663E-02 %(P 5.292E+00 1.57E+00 G K
                           92.80 1.505E+00 %   2.566E+00 7.82E-01 G
                           92.38 4.404E-01 % P 2.930E+00 8.73E-01 G

AM-241       1.7441E-01
                           59.54 1.744E-01 %(  6.962E-01 2.08E-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	1.4331E-02	1.4751E-02	2.9506E-01	2.9506E-01	3.457E-01
K-40		1.0312E+01	1.0312E+01	1.8005E+00	1.8912E+00	5.682E-01
MN-54	#A	-1.1334E-02	-1.1391E-02	5.9666E-02	5.9669E-02	6.399E-02
CO-57	#B	1.0801E-02	1.0863E-02	4.7072E-02	4.7076E-02	5.241E-02
CO-60	#B	6.3520E-04	6.3571E-04	5.4542E-02	5.4542E-02	6.857E-02

Sr-85	#A	-1.3954E-02	-1.4290E-02	5.6178E-02	5.6184E-02	6.226E-02
Kr-85	#A	-3.2182E+02	-3.2183E+02	1.2663E+03	1.2665E+03	1.437E+03
Y-88	#B	-8.3241E-03	-8.4454E-03	5.7299E-02	5.7301E-02	7.010E-02
NB-94	#B	5.0135E-04	5.0135E-04	4.5654E-02	4.5654E-02	5.615E-02
Ag-108M	#B	-4.0589E-04	-4.0591E-04	4.4554E-02	4.4554E-02	5.457E-02
CD-109	#A	-9.2216E-02	-9.2530E-02	4.1491E+00	4.1491E+00	2.406E+00
SN-113	#B	0.0000E+00	0.0000E+00	6.4747E-02	6.4747E-02	7.464E-02
SB-125	#B	1.2532E-02	1.2551E-02	1.3428E-01	1.3428E-01	1.566E-01
I-131	#B	8.6254E-03	1.0449E-02	4.6162E-02	4.6165E-02	4.376E-02
CS-134	#B	-2.9113E-03	-2.9173E-03	3.9596E-02	3.9596E-02	4.729E-02
CS-137		1.6426E-01	1.6428E-01	8.3439E-02	8.3947E-02	
CE-139	#A	-3.6688E-03	-3.7102E-03	5.1824E-02	5.1824E-02	4.950E-02
EU-152	#B	2.4944E-02	2.4952E-02	1.4291E-01	1.4291E-01	1.605E-01
EU-154	#B	-2.4861E-02	-2.4873E-02	1.1200E-01	1.1201E-01	1.224E-01
EU-155	#B	-1.6475E-02	-1.6489E-02	8.4215E-01	8.4215E-01	2.795E-01
HG-203	#B	5.3460E-05	5.5260E-05	4.5909E-02	4.5909E-02	5.133E-02
TL-208		2.3709E-01	2.3709E-01	7.5074E-02	7.6243E-02	
PB-212	#	5.8889E-01	5.8889E-01	1.4053E-01	1.4436E-01	1.141E-01
PB-214	#	3.4924E-01	3.4924E-01	1.2510E-01	1.2662E-01	1.010E-01
BI-212		9.1313E-01	9.1313E-01	8.1342E-01	8.1503E-01	
BI-214		4.4577E-01	4.4577E-01	1.5909E-01	1.6104E-01	
RA-224	#A	-6.3719E-02	-6.3719E-02	2.2537E+00	2.2537E+00	1.338E+00
RA-226	#	1.4596E+00	1.4596E+00	1.1193E+00	1.1223E+00	1.166E+00
AC-228		6.4978E-01	6.4978E-01	2.4419E-01	2.4690E-01	
TH-227	#B	-1.3418E-01	-1.3418E-01	4.7011E-01	4.7018E-01	5.113E-01
PA-234	#B	-6.8660E-02	-6.8660E-02	2.4484E-01	2.4487E-01	2.723E-01
TH-234	#B	-1.6626E-02	-1.6626E-02	3.7154E+02	3.7154E+02	5.292E+00
AM-241	#A	1.7441E-01	1.7441E-01	6.2502E-01	6.2510E-01	6.962E-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) 1.2722320E+01 pCi/gm
Total Decayed Activity (50.2 to 1999.0 keV) 1.2722342E+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_13JUL2006_1742.An1

Sample description
FSS-OOL-14-01-016-F-B

Spectrum Filename: C:\GammaVision\Spectra\102F_13JUL2006_1742.An1

Acquisition information
Start time: 13-Jul-2006 17:42:16
Live time: 2000
Real time: 2020
Dead time: 1.01 %
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: 1.6740E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6740E+03) =
5.9737E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

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

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

Corrections	Status	Comments
Decay correct to date:	YES	11-Jul-2006 10:55:00
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. 11 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6787

***** 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	71.	40.62	1.10	8.758E-03				
74.08	71.	40.62	1.10	8.758E-03	74.81	9.600	PBC<MDA	PB212
77.29	211.	14.18	1.10	9.723E-03	77.11	10.700	1.668E+00	PB214
					77.11	17.500	1.020E+00	PB212
86.97	101.	29.02	1.11	1.216E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	PBC<MDA	CD109
89.96	92.	30.77	1.11	1.281E-02				
89.96	92.	30.77	1.11	1.281E-02	92.38	2.570	PBC<MDA	TH234
93.60	131.	22.54	1.11	1.353E-02	92.80	3.000	2.649E+00	TH234
					94.67	15.500	4.996E-01	PA234
186.30	128.	23.41	1.40	1.625E-02	185.99	3.280	1.877E+00	RA226
209.47	80.	29.87	1.04	1.518E-02				
239.03	618.	5.05	1.50	1.365E-02	238.63	43.100	8.389E-01	PB212
					241.92	7.470	4.894E+00	PB214
239.01	646.	4.60	1.22	1.379E-02	238.63	43.100	8.768E-01	PB212
					241.92	7.470	5.115E+00	PB214
242.20	93.	21.51	1.22	1.364E-02				
270.88	69.	28.40	1.30	1.240E-02				
295.57	130.	14.48	0.89	1.145E-02	295.22	19.200	4.767E-01	PB214
328.35	43.	32.97	0.84	1.036E-02				
338.85	169.	13.09	1.25	1.005E-02	338.40	12.010	1.128E+00	AC228
352.71	232.	8.73	1.59	9.659E-03	351.99	37.100	5.202E-01	PB214
511.11	104.	17.66	1.26	6.690E-03	510.72	22.500	5.600E-01	TL208
584.02	176.	9.34	1.56	5.882E-03	583.14	86.000	2.795E-01	TL208
610.12	154.	11.51	1.52	5.642E-03	609.32	46.090	4.771E-01	BI214
728.35	34.	30.79	1.55	4.794E-03	727.17	11.800	4.877E-01	BI212
912.33	146.	10.47	1.74	3.917E-03	911.07	29.000	1.035E+00	AC228

965.96	20.	41.60	1.71	3.734E-03	964.00	14.580	PBC<MDA	EU152
969.89	105.	16.76	2.05	3.715E-03	968.90	17.460	1.303E+00	AC228
1118.86	58.	27.40	1.19	3.283E-03	1120.28	15.040	9.433E-01	BI214
1462.64	524.	4.49	2.00	2.618E-03	1460.75	10.700	1.509E+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
147.74	74.52	375.	71.	0.035	121.86	1.098	BI-207 D
154.16	77.73	342.	211.	0.105	42.55	1.100	PB-214 D
173.51	87.22	377.	101.	0.050	87.06	1.107	PB-214 lD
179.50	90.21	358.	92.	0.046	92.32	1.109	PB-214 lD
418.57	209.47	226.	80.	0.040	89.61	1.043	AC-228 s
477.64	239.03	120.	646.	0.323	13.81	1.215	PB-212 D
484.04	242.23	156.	93.	0.047	64.54	1.217	PB-214 D
541.40	270.88	138.	69.	0.035	85.19	1.305	AC-228 s
656.37	328.35	79.	43.	0.022	98.91	0.844	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-214	153.80	77.11	861.	181.	0.091	72.21	1.500D
PB-212	153.80	77.11	861.	181.	0.091	72.21	1.500D
TH-234	186.14	93.28	817.	136.	0.068	92.60	1.500
RA-226	372.22	186.30	315.	124.	0.062	70.22	1.401s
PB-212	477.67	239.02	380.	576.	0.288	19.04	1.500
RA-224	483.60	241.98	398.	71.	0.036	122.28	1.500
PB-214	477.69	239.03	179.	618.	0.309	15.16	1.500
PB-214	591.07	295.71	145.	124.	0.062	49.35	1.500
AC-228	677.38	338.85	110.	169.	0.084	39.28	1.255s
PB-214	704.79	352.55	104.	211.	0.105	29.07	1.500s
TL-208	1021.99	511.11	68.	104.	0.052	52.99	1.265s
TL-208	1167.87	584.02	40.	175.	0.088	28.03	1.563
BI-214	1220.09	610.12	55.	154.	0.077	34.52	1.522
BI-212	1456.66	728.35	38.	34.	0.017	92.36	1.554s
AC-228	1824.80	912.33	25.	146.	0.073	31.40	1.744
AC-228	1939.98	969.89	52.	105.	0.052	50.27	2.054
BI-214	2238.12	1118.86	49.	58.	0.029	82.20	1.195s
K-40	2926.19	1462.64	10.	520.	0.260	13.65	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		3.3421E-02					
			477.56	3.342E-02	%(	4.534E-01 1.30E-01	G
K-40		1.4977E+01					
			1460.75	1.498E+01	(P	4.969E-01 6.82E-01	G
MN-54		-7.8479E-03					
			834.81	-7.848E-03	&(P	6.006E-02 1.70E-02	G
CO-57		1.7774E-02					
			122.07	1.777E-02	%(	4.561E-02 1.37E-02	G K
			136.43	-8.567E-02	%	4.740E-01 1.42E-01	G
CO-60		1.2443E-02					
			1332.51	1.244E-02	%(P	7.164E-02 2.03E-02	G K
			1173.23	2.711E-03	&	8.242E-02 2.31E-02	G K
Sr-85		-5.9088E-03					
			514.00	-5.909E-03	%(	6.143E-02 1.78E-02	G
Kr-85		-1.3318E+02					
			513.99	-1.332E+02	%(	1.384E+03 4.02E+02	G
Y-88		-2.5191E-05					
			1836.01	-2.519E-05	&(P	2.829E-02 3.84E-03	G K
			898.02	-4.484E-03	& P	6.350E-02 1.75E-02	G
NB-94		-7.1522E-03					
			871.10	-7.152E-03	%(	5.242E-02 1.48E-02	G K
			702.50	1.962E-02	%	4.597E-02 1.38E-02	G K
Ag-108M		9.7479E-03					
			722.95	9.748E-03	&(	5.441E-02 1.56E-02	G K
			614.37	-1.982E-02	% P	6.994E-02 2.07E-02	G
			433.93	-3.676E-04	&	4.763E-02 1.35E-02	G
CD-109		1.4501E+00					
			88.04	1.450E+00	%(P	2.357E+00 7.18E-01	G
SN-113		-9.9803E-04					
			391.71	-9.980E-04	%(	6.748E-02 1.93E-02	G K
			255.04	1.045E-01	%	1.661E+00 4.82E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-4.1561E-02						
		427.95	-4.156E-02	%(P	1.573E-01	4.61E-02	G K
		600.77	-4.212E-02	% P	2.864E-01	8.24E-02	G
		636.15	1.450E-01	& P	4.112E-01	1.22E-01	G
		463.51	2.417E-01	% P	5.300E-01	1.60E-01	G
		176.29	-9.574E-02	% P	7.463E-01	2.21E-01	G
I-131	1.4373E-02						
		364.48	1.437E-02	&(	6.601E-02	1.95E-02	G K
		636.97	2.922E-01	&	7.191E-01	2.15E-01	G
		284.29	2.154E-01	%	7.736E-01	2.30E-01	G
CS-134	3.1227E-03						
		604.66	3.123E-03	&(	3.466E-02	9.56E-03	G K
		795.76	4.813E-02	%	6.510E-02	2.07E-02	G
		569.29	-4.434E-02	%	2.791E-01	8.00E-02	G
		801.84	-8.926E-02	% P	6.494E-01	1.85E-01	G
CS-137	4.2789E-02						
		661.62	4.279E-02	%(	6.271E-02	1.96E-02	G
CE-139	-1.2786E-02						
		165.85	-1.279E-02	&(P	5.891E-02	1.76E-02	G
EU-152	-3.2613E-02						
		121.78	-3.261E-02	%(P	1.755E-01	5.24E-02	G K
		344.30	-1.077E-02	%	1.617E-01	4.69E-02	G
		1408.08	2.146E-02	%	2.452E-01	6.52E-02	G
		964.00	2.931E-01	% P	3.845E-01	1.23E-01	G
		1112.07	-2.901E-02	%	6.336E-01	1.79E-01	G
		778.90	8.270E-02	& P	3.948E-01	1.14E-01	G
EU-154	-1.8427E-02						
		123.10	-1.843E-02	%(P	1.104E-01	3.29E-02	G K
		1274.80	-2.113E-03	%	2.127E-01	5.83E-02	G
		723.30	-1.909E-03	& P	4.964E-01	1.44E-01	G
		1004.80	9.660E-02	%	2.988E-01	8.75E-02	G
EU-155	1.2741E-01						
		86.45	1.274E-01	%(P	2.999E-01	9.07E-02	G K
		105.31	3.050E-05	%	2.603E-01	7.70E-02	G
HG-203	-5.7757E-03						
		279.17	-5.776E-03	%(P	5.689E-02	1.67E-02	G K
		72.87	-4.832E-02	%	2.221E+00	6.62E-01	G
		70.83	-2.062E-01	%	4.475E+00	1.33E+00	G
		82.50	-5.049E-01	%	4.625E+00	1.38E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.7952E-01						
		583.14	2.795E-01	(P	5.106E-02	2.62E-02	G
		510.72	5.600E-01	+	2.197E-01	9.90E-02	G
PB-212	8.0888E-01						
		238.63	7.815E-01	(	1.269E-01	4.96E-02	G K
							Energy duplication
		77.11	8.764E-01	(	6.743E-01	2.11E-01	G
		74.81	7.346E-01	& P	1.357E+00	4.12E-01	G
PB-214	4.6658E-01						
		351.99	4.735E-01	@(P	1.129E-01	4.60E-02	G K
		295.22	4.532E-01	(	2.156E-01	7.46E-02	G
							Energy duplication
		77.11	1.433E+00	+	1.103E+00	3.45E-01	G
		241.92	4.894E+00	+	5.152E-01	2.47E-01	G
BI-212	4.8773E-01						
		727.17	4.877E-01	*(	4.501E-01	1.50E-01	G K
		1620.56	-3.325E-01	% P	2.476E+00	6.70E-01	G
		785.42	4.274E-01	% P	2.721E+00	7.77E-01	G
BI-214	4.7715E-01						
		609.32	4.771E-01	(	1.156E-01	5.50E-02	G K
		1764.51	-7.963E-02	% P	4.169E-01	1.15E-01	G
		1120.28	9.433E-01	+	5.792E-01	2.59E-01	G
RA-224	1.0731E+00						
		241.00	1.073E+00	&(P	1.445E+00	4.45E-01	G
RA-226	1.8768E+00						
		185.99	1.877E+00	*(P	1.292E+00	4.55E-01	G
AC-228	1.1339E+00						
		911.07	1.035E+00	(P	1.854E-01	1.09E-01	G K
		968.90	1.303E+00	(P	4.525E-01	2.19E-01	G
		338.40	1.128E+00	*(	3.450E-01	1.48E-01	G
TH-227	-3.1384E-02						
		236.00	-3.138E-02	%(P	5.490E-01	1.63E-01	G K
		256.25	9.641E-02	%	5.614E-01	1.66E-01	G
PA-234	3.0322E-03						
		98.44	3.032E-03	%(	2.789E-01	8.28E-02	G K
		946.00	-5.378E-02	%	3.354E-01	9.61E-02	G
		131.28	9.001E-03	%	2.647E-01	7.85E-02	G
		94.67	1.661E-02	%	5.109E-01	1.52E-01	G
		883.24	-7.041E-02	%	5.322E-01	1.52E-01	G
		926.70	-3.652E-02	%	5.349E-01	1.49E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-6.570E-02 %   4.131E-01 1.18E-01 G

TH-234       1.9802E+00
                           63.29 1.387E+00 %(P 5.144E+00 1.55E+00 G K
                           92.80 2.752E+00  (  2.743E+00 8.49E-01 G
                           92.38 3.849E-01 & P 2.901E+00 8.66E-01 G

AM-241       1.9403E-02
                           59.54 1.940E-02 &(  7.805E-01 2.32E-01 G
   ( - This peak used in the nuclide activity average.

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

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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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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	3.2446E-02	3.3421E-02	3.8928E-01	3.8929E-01	4.401E-01
K-40		1.4977E+01	1.4977E+01	2.0450E+00	2.2110E+00	
MN-54	#A	-7.8082E-03	-7.8479E-03	5.6702E-02	5.6704E-02	5.976E-02
CO-57	#B	1.7670E-02	1.7774E-02	4.1240E-02	4.1251E-02	4.534E-02
CO-60	#B	1.2433E-02	1.2443E-02	6.0826E-02	6.0830E-02	7.158E-02

Sr-85	#A	-5.7663E-03	-5.9088E-03	5.3466E-02	5.3467E-02	5.995E-02
Kr-85	#A	-1.3317E+02	-1.3318E+02	1.2046E+03	1.2046E+03	1.384E+03
Y-88	#B	-2.4820E-05	-2.5191E-05	1.5115E-04	1.5115E-04	2.787E-02
NB-94	#B	-7.1522E-03	-7.1522E-03	4.4306E-02	4.4308E-02	5.242E-02
Ag-108M	#B	9.7475E-03	9.7479E-03	4.6739E-02	4.6743E-02	5.441E-02
CD-109	#A	1.4451E+00	1.4501E+00	2.1552E+00	2.1567E+00	2.349E+00
SN-113	#B	-9.8440E-04	-9.9803E-04	5.7932E-02	5.7932E-02	6.655E-02
SB-125	#B	-4.1496E-02	-4.1561E-02	1.6313E-01	1.6315E-01	1.570E-01
I-131	#B	1.1806E-02	1.4373E-02	5.8360E-02	5.8366E-02	5.422E-02
CS-134	#B	3.1162E-03	3.1227E-03	2.8684E-02	2.8684E-02	3.459E-02
CS-137	#A	4.2783E-02	4.2789E-02	5.8891E-02	5.8940E-02	6.270E-02
CE-139	#A	-1.2640E-02	-1.2786E-02	5.4983E-02	5.4988E-02	5.824E-02
EU-152	#B	-3.2601E-02	-3.2613E-02	1.7159E-01	1.7160E-01	1.754E-01
EU-154	#B	-1.8418E-02	-1.8427E-02	1.0121E-01	1.0121E-01	1.104E-01
EU-155	#B	1.2730E-01	1.2741E-01	2.7203E-01	2.7212E-01	2.996E-01
HG-203	#B	-5.5828E-03	-5.7757E-03	5.1510E-02	5.1511E-02	5.499E-02
TL-208		2.7952E-01	2.7952E-01	7.8543E-02	8.0094E-02	
PB-212	#	8.0888E-01	8.0888E-01	1.5398E-01	1.6053E-01	1.269E-01
PB-214	#	4.6658E-01	4.6658E-01	1.3368E-01	1.3622E-01	1.129E-01
BI-212	#	4.8773E-01	4.8773E-01	4.5047E-01	4.5130E-01	4.501E-01
BI-214		4.7715E-01	4.7715E-01	1.6473E-01	1.6690E-01	
RA-224	#A	1.0731E+00	1.0731E+00	1.3336E+00	1.3350E+00	1.445E+00
RA-226	#	1.8768E+00	1.8768E+00	1.3653E+00	1.3694E+00	
AC-228		1.1339E+00	1.1339E+00	2.6886E-01	2.7629E-01	
TH-227	#B	-3.1384E-02	-3.1384E-02	5.3658E-01	5.3658E-01	5.490E-01
PA-234	#B	3.0322E-03	3.0322E-03	2.4847E-01	2.4847E-01	2.789E-01
TH-234	#B	1.9802E+00	1.9802E+00	1.8336E+00	1.8369E+00	5.144E+00
AM-241	#A	1.9402E-02	1.9403E-02	6.9555E-01	6.9555E-01	7.805E-01

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

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

Total Activity (270.7 to 1999.0 keV) 1.8743912E+01 pCi/gm
Total Decayed Activity (270.7 to 1999.0 keV) 1.8743919E+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_17JUL2006_1832.An1

Sample description
FSS- OOL-14-01-020-F

Spectrum Filename: C:\GammaVision\Spectra\102F_17JUL2006_1832.An1

Acquisition information

Start time:	17-Jul-2006 18:32:17
Live time:	2000
Real time:	2018
Dead time:	0.90 %
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:	1.5930E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.5930E+03) = 6.2775E+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	13-Jul-2006 09:15:00
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. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6920

***** 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	141.	30.47	1.50	8.847E-03	70.83	3.520	4.799E+00	HG203
					74.81	9.600	PBC<MDA	PB212
77.15	173.	24.69	1.50	9.541E-03	77.11	10.700	1.440E+00	PB214
					77.11	17.500	8.804E-01	PB212
77.15	173.	24.69	1.50	9.541E-03	77.11	10.700	1.440E+00	PB214
					77.11	17.500	8.804E-01	PB212
93.38	116.	35.40	1.50	1.333E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	2.452E+00	TH234
186.02	131.	22.56	1.19	1.627E-02	185.99	3.280	2.012E+00	RA226
209.62	85.	29.07	1.44	1.518E-02				
239.13	721.	4.34	1.22	1.379E-02	238.63	43.100	1.028E+00	PB212
242.21	102.	21.27	1.22	1.364E-02	241.00	3.900	1.607E+00	RA224
					241.92	7.470	8.510E-01	PB214
270.36	93.	26.60	1.03	1.242E-02				
295.78	131.	12.69	1.26	1.145E-02	295.22	19.200	5.040E-01	PB214
300.93	49.	28.90	1.26	1.127E-02				
328.44	39.	33.73	1.08	1.036E-02				
339.09	122.	20.66	1.25	1.004E-02	338.40	12.010	8.573E-01	AC228
352.57	273.	10.46	1.28	9.663E-03	351.99	37.100	6.440E-01	PB214
463.59	41.	28.57	1.10	7.364E-03	463.51	10.000	4.535E-01	SB125
511.95	98.	17.33	1.29	6.679E-03	510.72	22.500	5.547E-01	TL208
584.09	217.	9.70	1.32	5.881E-03	583.14	86.000	3.621E-01	TL208
610.43	139.	12.73	1.68	5.640E-03	609.32	46.090	4.529E-01	BI214
728.38	48.	25.86	1.14	4.787E-03	727.17	11.800	7.183E-01	BI212
912.74	120.	11.48	1.95	3.916E-03	911.07	29.000	8.896E-01	AC228
970.89	120.	14.42	1.20	3.711E-03				
1122.88	33.	28.14	0.80	3.277E-03				

1463.24	468.	4.89	1.84	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	
418.87	209.62	236.	85.	0.042	87.20	1.440	NP-239	sM
477.90	239.05	130.	721.	0.361	13.03	1.215	PB-212	D
484.05	242.12	186.	102.	0.051	63.81	1.217	PB-214	D
540.36	270.36	190.	93.	0.046	79.80	1.033	AC-228	M
601.21	300.78	104.	53.	0.026	95.82	1.370	PB-212	sM
656.55	328.44	69.	39.	0.019	101.18	1.081	RH-106M	M
1942.00	970.89	41.	122.	0.061	35.01	1.200	J-135	M
2246.16	1122.88	17.	27.	0.013	88.17	1.821	J-135	D
2927.39	1463.24	14.	465.	0.232	14.34	1.844	K-40	M

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

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.20	74.81	894.	141.	0.071	91.40	1.500s
PB-214	153.80	77.11	829.	173.	0.087	74.07	1.500D
PB-212	153.80	77.11	829.	173.	0.087	74.07	1.500D
TH-234	186.34	93.38	780.	116.	0.058	106.21	1.500s
RA-226	371.64	186.02	301.	127.	0.063	67.68	1.195s
TH-227	473.52	236.95	707.	-103.	-0.052	113.61	1.500
PB-212	477.98	239.17	347.	644.	0.322	17.04	1.500
RA-224	482.74	241.56	378.	109.	0.055	79.74	1.500
PB-214	482.77	241.57	374.	102.	0.051	85.61	1.500
PB-214	591.18	295.76	155.	126.	0.063	49.61	1.500s
AC-228	677.32	338.82	159.	89.	0.044	68.30	1.500
PB-214	704.71	352.51	104.	240.	0.120	26.41	1.500s
SB-125	926.94	463.60	50.	45.	0.022	77.59	1.500
TL-208	1023.68	511.95	66.	98.	0.049	51.99	1.294s
TL-208	1168.01	584.09	63.	216.	0.108	29.09	1.319s
BI-214	1220.72	610.43	58.	139.	0.069	38.18	1.680
BI-212	1456.72	728.38	39.	48.	0.024	77.59	1.141
AC-228	1825.56	912.71	19.	115.	0.058	32.16	1.679

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

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

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		9.1306E-02					
			477.56	9.131E-02	%(	5.115E-01 1.49E-01	G
K-40		8.3179E-02					
			1460.75	8.318E-02	%(P	1.023E+00 2.90E-01	G
MN-54		-1.4345E-02					
			834.81	-1.434E-02	%(P	7.161E-02 2.07E-02	G
CO-57		5.8784E-03					
			122.07	5.878E-03	%(	5.103E-02 1.51E-02	G K
			136.43	-1.350E-01	%	5.142E-01 1.54E-01	G
CO-60		-2.9446E-03					
			1332.51	-2.945E-03	%(P	6.679E-02 1.80E-02	G K
			1173.23	1.718E-03	%	7.603E-02 2.10E-02	G K
Sr-85		0.0000E+00					
			514.00	0.000E+00	%(	6.630E-02 1.90E-02	G
Kr-85		0.0000E+00					
			513.99	0.000E+00	%(	1.460E+03 4.19E+02	G
Y-88		-1.1086E-02					
			1836.01	-1.109E-02	%(P	7.215E-02 1.97E-02	G K
			898.02	-1.287E-03	& P	6.499E-02 1.76E-02	G
NB-94		-5.1882E-03					
			871.10	-5.188E-03	%(	6.443E-02 1.81E-02	G K
			702.50	0.000E+00	&	6.880E-02 1.95E-02	G K
Ag-108M		-8.9548E-03					
			722.95	-8.955E-03	%(	6.346E-02 1.81E-02	G K
			614.37	-7.130E-02	% P	9.543E-02 2.96E-02	G
			433.93	1.416E-02	%	3.298E-02 9.92E-03	G
CD-109		7.0584E-01					
			88.04	7.058E-01	%(P	2.487E+00 7.48E-01	G
SN-113		-6.6611E-03					
			391.71	-6.661E-03	&(	7.569E-02 2.19E-02	G K
			255.04	0.000E+00	&	2.218E+00 6.47E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.7364E-01						
		427.95	5.731E-02	%(P	1.527E-01	4.55E-02	G K
		600.77	-7.655E-02	% P	3.054E-01	8.94E-02	G
		636.15	-1.585E-02	% P	4.467E-01	1.25E-01	G
		463.51	5.180E-01	(P	4.132E-01	1.39E-01	G
		176.29	-1.086E-01	& P	8.011E-01	2.37E-01	G
I-131	2.5197E-03						
		364.48	2.520E-03	&(	8.640E-02	2.50E-02	G K
		636.97	-2.308E-02	%	9.950E-01	2.77E-01	G
		284.29	-1.495E-01	%	1.159E+00	3.41E-01	G
CS-134	1.6621E-02						
		604.66	1.662E-02	%(	4.433E-02	1.32E-02	G K
		795.76	2.565E-03	%	9.045E-02	2.57E-02	G
		569.29	-3.924E-02	%	3.385E-01	9.71E-02	G
		801.84	-1.382E-01	% P	7.966E-01	2.30E-01	G
CS-137	4.1242E-02						
		661.62	4.124E-02	&(	6.651E-02	2.06E-02	G
CE-139	1.9093E-02						
		165.85	1.909E-02	%(P	6.544E-02	1.96E-02	G
EU-152	-1.7362E-02						
		121.78	-1.736E-02	%(P	1.881E-01	5.59E-02	G K
		344.30	-5.399E-02	%	1.939E-01	5.77E-02	G
		1408.08	-3.221E-02	%	2.856E-01	7.76E-02	G
		964.00	-8.392E-02	% P	5.460E-01	1.57E-01	G
		1112.07	9.136E-02	%	5.625E-01	1.61E-01	G
		778.90	-9.431E-02	& P	5.662E-01	1.64E-01	G
EU-154	-4.9834E-03						
		123.10	-4.983E-03	%(P	1.324E-01	3.92E-02	G K
		1274.80	-2.061E-02	&	2.398E-01	6.73E-02	G
		723.30	-4.648E-02	% P	3.188E-01	9.14E-02	G
		1004.80	0.000E+00	&	3.083E-01	8.25E-02	G
EU-155	-2.4346E-02						
		86.45	-2.435E-02	&(P	3.044E-01	9.06E-02	G K
		105.31	3.788E-02	&	2.470E-01	7.35E-02	G
HG-203	3.3755E-02						
		279.17	3.376E-02	%(P	5.817E-02	1.78E-02	G K
		72.87	7.318E-02	%	2.882E+00	8.61E-01	G
		70.83	-1.128E-01	%	4.461E+00	1.33E+00	G
		82.50	-1.161E-01	%	4.586E+00	1.36E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.6206E-01						
		583.14	3.621E-01	@(P	6.639E-02	3.52E-02	G
		510.72	5.547E-01	+	2.293E-01	9.64E-02	G
PB-212	9.0701E-01						
		238.63	9.178E-01	(	1.276E-01	5.21E-02	G K
							Energy duplication
		77.11	8.804E-01	@(	6.953E-01	2.17E-01	G
		74.81	1.408E+00	+ P	1.419E+00	4.38E-01	G
PB-214	5.3937E-01						
		351.99	5.668E-01	@(P	1.187E-01	5.00E-02	G K
		295.22	4.863E-01	*(	2.338E-01	8.04E-02	G
							Energy duplication
		77.11	1.440E+00	+	1.137E+00	3.56E-01	G
		241.92	8.493E-01	+	7.716E-01	2.42E-01	G
BI-212	7.1829E-01						
		727.17	7.183E-01	(	4.776E-01	1.86E-01	G K
		1620.56	-4.318E-02	& P	3.363E+00	9.09E-01	G
		785.42	-4.162E-01	% P	3.378E+00	9.67E-01	G
BI-214	4.5286E-01						
		609.32	4.529E-01	(	1.245E-01	5.77E-02	G K
		1764.51	-2.075E-03	% P	6.461E-01	1.76E-01	G
		1120.28	-1.346E-01	%	6.164E-01	1.80E-01	G
RA-224	1.7380E+00						
		241.00	1.738E+00	&(P	1.482E+00	4.67E-01	G
RA-226	2.0120E+00						
		185.99	2.012E+00	*(P	1.330E+00	4.70E-01	G
AC-228	8.6015E-01						
		911.07	8.602E-01	(P	1.725E-01	9.24E-02	G K
		968.90	-3.695E-02	% P	4.947E-01	1.41E-01	G
		338.40	6.223E-01	-	4.319E-01	1.42E-01	G
TH-227	-5.6091E-01						
		236.00	-5.609E-01	?(P	6.888E-01	2.12E-01	G K
		256.25	-1.365E-01	%	6.604E-01	1.96E-01	G
PA-234	-1.3198E-01						
		98.44	-1.320E-01	%(	2.899E-01	8.78E-02	G K
		946.00	3.015E-02	&	3.454E-01	9.74E-02	G
		131.28	2.622E-03	&	2.765E-01	8.19E-02	G
		94.67	3.761E-02	%	5.198E-01	1.55E-01	G
		883.24	-7.598E-02	%	4.901E-01	1.39E-01	G
		926.70	9.065E-03	%	4.898E-01	1.33E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-4.618E-02 %   4.952E-01 1.41E-01 G

TH-234       1.8080E+00
                           63.29 1.313E+00 %(P 5.345E+00 1.60E+00 G K
                           92.80 2.452E+00 @(  2.817E+00 8.68E-01 G
                           92.38 1.732E-01 & P 3.054E+00 9.08E-01 G

AM-241       0.0000E+00
                           59.54 0.000E+00 &(  8.358E-01 2.48E-01 G
   ( - This peak used in the nuclide activity average.

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

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

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

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	8.6252E-02	9.1306E-02	4.4699E-01	4.4702E-01	4.832E-01
K-40	A	8.3179E-02	8.3179E-02	8.6942E-01	8.6944E-01	1.023E+00
MN-54	#A	-1.4206E-02	-1.4345E-02	6.5999E-02	6.6004E-02	7.091E-02
CO-57	#B	5.8125E-03	5.8784E-03	4.5343E-02	4.5344E-02	5.046E-02
CO-60	#B	-2.9399E-03	-2.9446E-03	6.3257E-02	6.3257E-02	6.668E-02

Sr-85	#A	0.0000E+00	0.0000E+00	5.7040E-02	5.7040E-02	6.326E-02
Kr-85	#A	0.0000E+00	0.0000E+00	1.2565E+03	1.2565E+03	1.460E+03
Y-88	#B	-1.0775E-02	-1.1086E-02	5.9415E-02	5.9418E-02	7.012E-02
NB-94	#B	-5.1882E-03	-5.1882E-03	5.4428E-02	5.4429E-02	6.443E-02
Ag-108M	#B	-8.9542E-03	-8.9548E-03	5.4435E-02	5.4438E-02	6.345E-02
CD-109	#A	7.0112E-01	7.0584E-01	2.2444E+00	2.2448E+00	2.471E+00
SN-113	#B	-6.4874E-03	-6.6611E-03	6.5776E-02	6.5777E-02	7.371E-02
SB-125	#F	1.7312E-01	1.7364E-01	1.3938E-01	1.3972E-01	1.522E-01
I-131	#B	1.7262E-03	2.5197E-03	7.4892E-02	7.4892E-02	5.919E-02
CS-134	#B	1.6554E-02	1.6621E-02	3.9588E-02	3.9599E-02	4.415E-02
CS-137	#A	4.1230E-02	4.1242E-02	6.1866E-02	6.1909E-02	6.649E-02
CE-139	#A	1.8675E-02	1.9093E-02	5.8931E-02	5.8941E-02	6.401E-02
EU-152	#B	-1.7351E-02	-1.7362E-02	1.9965E-01	1.9966E-01	1.880E-01
EU-154	#B	-4.9786E-03	-4.9834E-03	1.3037E-01	1.3037E-01	1.322E-01
EU-155	#B	-2.4305E-02	-2.4346E-02	5.5113E-01	5.5113E-01	3.039E-01
HG-203	#B	3.1623E-02	3.3755E-02	5.3367E-02	5.3401E-02	5.449E-02
TL-208	#	3.6206E-01	3.6206E-01	1.0554E-01	1.0747E-01	
PB-212	#	9.0701E-01	9.0701E-01	1.5458E-01	1.6275E-01	1.276E-01
PB-214	#	5.3937E-01	5.3937E-01	1.4270E-01	1.4588E-01	1.187E-01
BI-212		7.1829E-01	7.1829E-01	5.5731E-01	5.5877E-01	
BI-214		4.5286E-01	4.5286E-01	1.7292E-01	1.7478E-01	
RA-224	#	1.7380E+00	1.7380E+00	1.4006E+00	1.4040E+00	1.482E+00
RA-226	#	2.0119E+00	2.0120E+00	1.4098E+00	1.4143E+00	
AC-228		8.6015E-01	8.6015E-01	2.7720E-01	2.8137E-01	1.725E-01
TH-227	#A	-5.6091E-01	-5.6091E-01	6.3900E-01	6.3978E-01	6.888E-01
PA-234	#B	-1.3198E-01	-1.3198E-01	2.6349E-01	2.6359E-01	2.899E-01
TH-234	#B	1.8080E+00	1.8080E+00	1.9202E+00	1.9229E+00	5.345E+00
AM-241	#A	0.0000E+00	0.0000E+00	7.4428E-01	7.4428E-01	8.358E-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) 4.4053159E+00 pCi/gm
Total Decayed Activity (1460.5 to 1999.0 keV) 4.4053264E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_12JUL2006_1827.An1

Sample description
FSS-OOL-14-01-005-F-S

Spectrum Filename: C:\GammaVision\Spectra\103F_12JUL2006_1827.An1

Acquisition information
Start time: 12-Jul-2006 18:27:35
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: 1.1210E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.1210E+03) =
8.9206E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

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

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

Corrections	Status	Comments
Decay correct to date:	YES	12-Jul-2006 14:05:00
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. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2889

***** 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
75.00	63.	29.47	0.99	9.052E-03	74.81	9.600	8.686E-01	PB212
77.30	70.	27.78	0.99	1.011E-02	77.11	17.500	4.788E-01	PB212
					77.11	10.700	PBC<MDA	PB214
186.31	142.	18.22	1.22	2.566E-02	185.99	3.280	1.841E+00	RA226
209.03	77.	38.73	0.83	2.473E-02				
238.76	469.	5.49	1.09	2.319E-02	238.63	43.100	5.507E-01	PB212
242.10	58.	28.84	1.10	2.301E-02	241.00	3.900	7.822E-01	RA224
295.40	115.	14.52	1.13	2.024E-02	295.22	19.200	3.452E-01	PB214
300.09	30.	41.64	1.13	2.001E-02				
338.51	140.	17.08	1.23	1.830E-02	338.40	12.010	7.618E-01	AC228
351.98	185.	14.56	1.18	1.775E-02	351.99	37.100	3.277E-01	PB214
462.91	41.	34.67	1.38	1.426E-02				
462.91	41.	34.67	1.38	1.426E-02	463.51	10.000	PBC<MDA	SB125
511.18	117.	19.86	0.88	1.316E-02	510.72	22.500	3.658E-01	TL208
583.30	147.	11.75	1.34	1.184E-02	583.14	86.000	1.689E-01	TL208
609.43	183.	11.51	1.48	1.144E-02	609.32	46.090	4.041E-01	BI214
661.84	509.	5.29	1.44	1.072E-02	661.62	84.620	6.744E-01	CS137
727.71	49.	24.57	1.63	9.959E-03	727.17	11.800	4.973E-01	BI212
861.32	27.	34.55	0.68	8.762E-03				
911.38	113.	14.29	1.56	8.399E-03	911.07	29.000	5.415E-01	AC228
969.06	73.	19.10	1.83	8.025E-03	968.90	17.460	6.233E-01	AC228
1377.88	23.	25.21	1.39	6.194E-03				
1461.19	658.	3.96	2.03	5.931E-03	1460.75	10.700	1.215E+01	K40
1765.07	19.	22.84	2.03	5.142E-03	1764.51	15.920	2.779E-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
417.23	209.03	299.	77.	0.038	116.18	0.832	AC-228

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
483.36	242.07	113.	58.	0.029	86.53	1.095	PB-214	lD
599.32	300.12	62.	30.	0.015	124.91	1.131	PB-212	lD
1021.47	511.18	181.	49.	0.025	123.57	0.879	TL-208	s
1721.68	861.32	24.	27.	0.014	103.64	0.680	TL-208	s
2754.65	1377.88	4.	23.	0.012	75.64	1.386	BI-214	s

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

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	158.	63.	0.031	88.40	0.993D
PB-212	153.39	77.11	174.	70.	0.035	83.34	0.995D
RA-226	371.78	186.31	240.	129.	0.064	54.66	1.220s
PB-212	476.75	238.79	335.	447.	0.224	23.85	1.083
PB-214	590.03	295.44	124.	116.	0.058	48.99	1.228
AC-228	676.34	338.60	158.	96.	0.048	62.62	1.500s
PB-214	703.11	351.98	169.	179.	0.090	43.69	1.176s
SB-125	925.78	463.33	83.	37.	0.019	110.91	1.500
TL-208	1021.07	510.98	125.	47.	0.024	66.88	1.500s
TL-208	1165.94	583.42	52.	130.	0.065	33.95	1.500s
BI-214	1218.18	609.54	87.	141.	0.070	35.75	1.500s
CS-137	1322.77	661.84	55.	508.	0.254	15.87	1.445
BI-212	1454.50	727.71	32.	49.	0.024	73.72	1.634
AC-228	1821.97	911.47	35.	91.	0.046	40.00	1.505s
AC-228	1937.38	969.18	24.	50.	0.025	58.64	1.541s
K-40	2921.24	1461.19	25.	639.	0.320	11.89	2.028
BI-214	3528.89	1765.07	5.	19.	0.009	68.51	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	Nuclide Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.6030E-01					
			477.56	1.603E-01	%(	3.003E-01	9.19E-02 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
K-40	1.2145E+01						
		1460.75	1.215E+01	(P	4.897E-01	4.96E-01	G
MN-54	6.5162E-03						
		834.81	6.516E-03	&(P	3.637E-02	1.03E-02	G
CO-57	2.0734E-02						
		122.07	2.073E-02	%(P	4.853E-02	1.47E-02	G K
		136.43	3.532E-02	%	4.001E-01	1.18E-01	G
CO-60	1.2458E-02						
		1332.51	1.246E-02	%(P	4.709E-02	1.33E-02	G K
		1173.23	6.479E-03	& P	4.792E-02	1.33E-02	G K
Sr-85	-3.3590E-03						
		514.00	-3.359E-03	%(	4.897E-02	1.42E-02	G
Kr-85	-1.3673E+02						
		513.99	-1.367E+02	%(	1.117E+03	3.26E+02	G
Y-88	-4.7554E-04						
		1836.01	-4.755E-04	&(P	4.151E-02	1.06E-02	G K
		898.02	-9.549E-04	% P	4.698E-02	1.29E-02	G
NB-94	7.4971E-03						
		871.10	7.497E-03	%(	3.945E-02	1.13E-02	G K
		702.50	6.016E-03	%	2.614E-02	7.46E-03	G K
Ag-108M	-8.2983E-04						
		722.95	-8.298E-04	&(	3.999E-02	1.11E-02	G K
		614.37	-9.599E-03	% P	5.025E-02	1.47E-02	G
		433.93	-3.759E-03	%	4.426E-02	1.28E-02	G
CD-109	1.0676E+00						
		88.04	1.068E+00	&(	2.079E+00	6.32E-01	G
SN-113	1.8390E-02						
		391.71	1.839E-02	%(	5.083E-02	1.52E-02	G K
		255.04	2.410E-01	%	1.829E+00	5.39E-01	G
SB-125	7.7410E-02						
		427.95	-2.953E-03	%(P	1.442E-01	4.17E-02	G K
		600.77	6.328E-02	% P	2.371E-01	6.99E-02	G
		636.15	-1.595E-01	% P	4.107E-01	1.22E-01	G
		463.51	3.153E-01	(P	3.832E-01	1.21E-01	G
		176.29	1.505E-01	%	6.499E-01	1.94E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
I-131	9.9121E-03						
		364.48	9.912E-03	%(P	4.539E-02	1.34E-02	G K
		636.97	1.637E-01	%	5.352E-01	1.58E-01	G
		284.29	-1.822E-01	% P	6.430E-01	1.92E-01	G
CS-134	2.1193E-02						
		604.66	2.119E-02	%(	3.388E-02	1.05E-02	G K
		795.76	-1.324E-04	% P	5.171E-02	1.44E-02	G
		569.29	8.351E-02	% P	2.125E-01	6.30E-02	G
		801.84	-1.064E-01	% P	4.391E-01	1.23E-01	G
CS-137	6.7444E-01						
		661.62	6.744E-01	(P	4.968E-02	3.58E-02	G
CE-139	2.4027E-04						
		165.85	2.403E-04	%(	4.362E-02	1.28E-02	G
EU-152	-5.0957E-03						
		121.78	-5.096E-03	%(P	1.550E-01	4.56E-02	G K
		344.30	-2.885E-03	% P	1.514E-01	4.40E-02	G
		1408.08	2.242E-03	%	1.772E-01	4.63E-02	G
		964.00	-3.661E-02	% P	3.272E-01	9.20E-02	G
		1112.07	6.718E-02	%	3.347E-01	9.59E-02	G
		778.90	3.555E-03	%	3.182E-01	8.87E-02	G
EU-154	7.1806E-03						
		123.10	7.181E-03	&(	1.155E-01	3.41E-02	G K
		1274.80	3.899E-02	%	1.385E-01	4.04E-02	G
		723.30	-6.662E-02	%	2.249E-01	6.64E-02	G
		1004.80	-1.158E-02	&	2.407E-01	6.66E-02	G
EU-155	1.4859E-01						
		86.45	1.486E-01	%(	2.585E-01	7.88E-02	G K
		105.31	3.641E-02	%	2.541E-01	7.55E-02	G
HG-203	1.9083E-03						
		279.17	1.908E-03	&(P	4.672E-02	1.36E-02	G K
		72.87	-4.142E-02	% P	2.665E+00	7.89E-01	G
		70.83	0.000E+00	&	5.183E+00	1.53E+00	G
		82.50	-6.324E-01	%	4.212E+00	1.25E+00	G
TL-208	1.6130E-01						
		583.14	1.534E-01	*(P	4.303E-02	1.79E-02	G
		510.72	1.916E-01	*(P	2.230E-01	6.69E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-212	5.2160E-01						
		238.63	5.390E-01	(P	1.061E-01	4.40E-02	G K
							Energy duplication
		77.11	4.788E-01	(P	4.367E-01	1.39E-01	G
		74.81	8.686E-01	+ P	8.494E-01	2.69E-01	G
PB-214	3.3857E-01						
		351.99	3.277E-01	@(P	1.158E-01	4.92E-02	G K
		295.22	3.595E-01	(P	1.693E-01	6.08E-02	G
							Energy duplication
		77.11	-2.152E-02	% P	1.058E+00	3.11E-01	G
		241.92	-3.679E-02	%	6.237E-01	1.84E-01	G
BI-212	4.9729E-01						
		727.17	4.973E-01	(P	3.001E-01	1.24E-01	G K
		1620.56	4.074E-01	% P	1.046E+00	3.09E-01	G
		785.42	-2.166E-01	%	2.198E+00	6.25E-01	G
BI-214	3.1051E-01						
		609.32	3.218E-01	@(P	1.054E-01	4.01E-02	G K
		1764.51	2.779E-01	?(P	1.932E-01	7.45E-02	G
		1120.28	1.964E-01	% P	3.774E-01	1.14E-01	G
RA-224	6.3309E-01						
		241.00	6.331E-01	%(	1.169E+00	3.56E-01	G
RA-226	1.8407E+00						
		185.99	1.841E+00	(P	1.074E+00	3.69E-01	G
AC-228	4.6131E-01						
		911.07	4.504E-01	*(P	1.505E-01	6.23E-02	G K
		968.90	4.344E-01	(P	2.190E-01	8.52E-02	G
		338.40	5.269E-01	*(P	3.363E-01	1.11E-01	G
TH-227	-1.5625E-01						
		236.00	-1.563E-01	%(	4.522E-01	1.36E-01	G K
		256.25	6.830E-02	& P	5.995E-01	1.77E-01	G
PA-234	2.0220E-04						
		98.44	2.022E-04	%(P	2.413E-01	7.10E-02	G K
		946.00	-1.558E-04	& P	2.392E-01	6.65E-02	G
		131.28	-1.763E-02	% P	2.314E-01	6.85E-02	G
		94.67	1.113E-03	% P	4.347E-01	1.28E-01	G
		883.24	3.474E-03	&	3.031E-01	8.26E-02	G
		926.70	7.452E-02	%	3.295E-01	9.45E-02	G
		569.26	1.239E-01	% P	3.153E-01	9.35E-02	G

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

TH-234       1.6563E+00
                           63.29 1.656E+00 %(P 6.555E+00 1.95E+00 G K
                           92.80 8.139E-01 % P 2.398E+00 7.14E-01 G
                           92.38 8.556E-01 % P 2.949E+00 8.77E-01 G

AM-241      -3.9103E-01
                           59.54-3.910E-01 %(P 1.274E+00 3.82E-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	1.5992E-01	1.6030E-01	2.7566E-01	2.7582E-01	2.996E-01
K-40		1.2145E+01	1.2145E+01	1.4867E+00	1.6454E+00	
MN-54	#A	6.5136E-03	6.5162E-03	3.0992E-02	3.0994E-02	3.635E-02
CO-57	#B	2.0724E-02	2.0734E-02	4.3976E-02	4.3991E-02	4.850E-02
CO-60	#B	1.2457E-02	1.2458E-02	3.9817E-02	3.9824E-02	4.709E-02
Sr-85	#A	-3.3524E-03	-3.3590E-03	4.2621E-02	4.2621E-02	4.887E-02

Kr-85	#A	-1.3673E+02	-1.3673E+02	9.7807E+02	9.7810E+02	1.117E+03
Y-88	#B	-4.7498E-04	-4.7554E-04	6.2060E-02	6.2060E-02	4.146E-02
NB-94	#B	7.4971E-03	7.4971E-03	3.3900E-02	3.3903E-02	3.945E-02
Ag-108M	#B	-8.2982E-04	-8.2983E-04	3.3272E-02	3.3272E-02	3.999E-02
CD-109	#A	1.0673E+00	1.0676E+00	1.8951E+00	1.8960E+00	2.078E+00
SN-113	#B	1.8370E-02	1.8390E-02	4.5576E-02	4.5589E-02	5.077E-02
SB-125	#B	7.7400E-02	7.7410E-02	8.8797E-02	8.8911E-02	1.442E-01
I-131	#B	9.7575E-03	9.9121E-03	4.0096E-02	4.0100E-02	4.468E-02
CS-134	#B	2.1190E-02	2.1193E-02	3.1620E-02	3.1644E-02	3.387E-02
CS-137		6.7443E-01	6.7444E-01	1.0732E-01	1.1424E-01	
CE-139	#A	2.4005E-04	2.4027E-04	3.8302E-02	3.8302E-02	4.358E-02
EU-152	#B	-5.0955E-03	-5.0957E-03	2.7159E-01	2.7159E-01	1.550E-01
EU-154	#B	7.1803E-03	7.1806E-03	1.0241E-01	1.0241E-01	1.155E-01
EU-155	#B	1.4858E-01	1.4859E-01	2.3638E-01	2.3652E-01	2.584E-01
HG-203	#B	1.9031E-03	1.9083E-03	4.0942E-02	4.0942E-02	4.659E-02
TL-208	#	1.6130E-01	1.6130E-01	5.6576E-02	5.7346E-02	4.303E-02
PB-212		5.2160E-01	5.2160E-01	1.2771E-01	1.3125E-01	
PB-214		3.3857E-01	3.3857E-01	1.1484E-01	1.1651E-01	
BI-212		4.9729E-01	4.9729E-01	3.7036E-01	3.7148E-01	
BI-214	#	3.1051E-01	3.1051E-01	1.1610E-01	1.1749E-01	1.054E-01
RA-224	#A	6.3309E-01	6.3309E-01	1.0678E+00	1.0684E+00	1.169E+00
RA-226	#	1.8407E+00	1.8407E+00	1.1076E+00	1.1127E+00	
AC-228	#	4.6131E-01	4.6131E-01	1.4742E-01	1.4983E-01	1.505E-01
TH-227	#B	-1.5625E-01	-1.5625E-01	4.0834E-01	4.0844E-01	4.522E-01
PA-234	#B	2.0220E-04	2.0220E-04	2.1306E-01	2.1306E-01	2.413E-01
TH-234	#B	1.6563E+00	1.6563E+00	5.8430E+00	5.8438E+00	6.555E+00
AM-241	#A	-3.9103E-01	-3.9103E-01	1.1629E+00	1.1631E+00	1.274E+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 (85.9 to 2000.7 keV) 1.6017761E+01 pCi/gm
Total Decayed Activity (85.9 to 2000.7 keV) 1.6017769E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_13JUL2006_1556.An1

Sample description
FSS-OOL-14-01-006-F

Spectrum Filename: C:\GammaVision\Spectra\103F_13JUL2006_1556.An1

Acquisition information
Start time: 13-Jul-2006 15:56:11
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: 1.8800E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8800E+03) =
5.3191E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

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

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

Corrections	Status	Comments
Decay correct to date:	YES	12-Jul-2006 14:02:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1653

***** 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
74.89	58.	41.24	0.99	9.052E-03	70.83	3.520	1.672E+00	HG203
					74.81	9.600	PBC<MDA	PB212
76.63	240.	17.78	1.03	9.892E-03	77.11	17.500	9.625E-01	PB212
					77.11	10.700	1.574E+00	PB214
93.08	91.	36.02	1.50	1.645E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
93.08	95.	35.02	1.50	1.631E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
129.14	87.	40.30	1.07	2.438E-02				
186.50	142.	27.30	1.06	2.565E-02	185.99	3.280	1.103E+00	RA226
209.55	82.	27.88	1.08	2.470E-02				
238.75	898.	3.89	1.09	2.320E-02	238.63	43.100	6.373E-01	PB212
					241.92	7.470	3.755E+00	PB214
238.84	455.	8.72	1.50	2.302E-02	238.63	43.100	PBC<MDA	PB212
					241.92	7.470	1.903E+00	PB214
271.00	79.	37.67	0.83	2.147E-02				
295.30	198.	10.13	1.13	2.026E-02	295.22	19.200	3.578E-01	PB214
300.07	65.	24.84	1.13	2.003E-02				
327.39	55.	40.18	1.11	1.877E-02				
338.36	252.	12.16	1.29	1.830E-02	338.40	12.010	8.218E-01	AC228
352.07	247.	9.30	1.05	1.775E-02	351.99	37.100	2.632E-01	PB214
463.30	66.	30.90	1.20	1.425E-02				
463.30	66.	30.90	1.20	1.425E-02	463.51	10.000	3.243E-01	SB125
510.77	134.	17.96	1.42	1.317E-02	510.72	22.500	2.610E-01	TL208
583.42	299.	7.55	1.13	1.184E-02	583.14	86.000	2.079E-01	TL208
609.49	236.	12.00	1.09	1.144E-02	609.32	46.090	3.124E-01	BI214
661.45	56.	29.03	1.05	1.072E-02				

661.45	56.	29.03	1.05	1.072E-02	661.62	84.620	4.359E-02	CS137
727.45	100.	20.29	1.73	9.962E-03	727.17	11.800	6.071E-01	BI212
795.22	60.	32.61	1.28	9.306E-03				
795.22	60.	32.61	1.28	9.306E-03	795.76	85.400	5.391E-02	CS134
859.98	78.	19.43	1.13	8.772E-03				
911.29	182.	8.70	1.76	8.400E-03	911.07	29.000	5.264E-01	AC228
964.68	34.	31.15	1.54	8.052E-03	964.00	14.580	PBC<MDA	EU152
969.21	130.	10.84	1.54	8.024E-03	968.90	17.460	6.679E-01	AC228

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1120.72	82.	20.88	1.00	7.210E-03	1120.28	15.040	5.309E-01	BI214
1461.13	1155.	3.07	1.75	5.931E-03	1460.75	10.700	1.287E+01	K40
1765.01	46.	17.54	1.50	5.141E-03	1764.51	15.920	3.734E-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	
257.45	129.14	468.	117.	0.058	83.45	1.069	AC-228	s
418.11	209.48	416.	90.	0.045	112.59	1.143	AC-228	s
482.36	241.53	349.	118.	0.059	72.69	1.095	PB-214	lD
541.15	271.00	314.	79.	0.040	113.02	0.832	AC-228	s
598.82	299.84	132.	47.	0.023	112.57	1.216	TH-227	s
653.93	327.39	179.	55.	0.027	120.55	1.108	AC-228	s
1719.01	859.98	46.	78.	0.039	58.30	1.127	TL-208	s
1929.01	964.71	36.	38.	0.019	82.35	1.538	AC-228	D

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

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	153.39	77.11	284.	139.	0.070	46.37	0.995A
TH-234	185.34	93.08	743.	95.	0.048	105.07	1.500s
RA-226	372.15	186.50	563.	87.	0.043	104.17	1.500s
PB-212	476.71	238.78	561.	840.	0.420	16.81	1.077
RA-224	482.67	241.76	641.	89.	0.044	124.95	1.500
PB-214	476.84	238.84	561.	455.	0.228	26.17	1.500s
PB-214	589.29	295.07	222.	203.	0.102	40.78	1.016
AC-228	675.86	338.36	224.	251.	0.126	36.49	1.286s
PB-214	703.38	352.12	164.	263.	0.132	29.43	1.055
SB-125	925.25	463.06	132.	50.	0.025	102.58	1.500s
TL-208	1020.65	510.77	162.	108.	0.054	53.89	1.424s
TL-208	1165.94	583.42	88.	295.	0.147	22.64	1.132
BI-214	1218.08	609.49	155.	229.	0.115	36.00	1.086
CS-137	1322.69	661.80	80.	46.	0.023	89.90	1.500
BI-212	1453.97	727.45	92.	99.	0.050	60.86	1.729s
CS-134	1589.24	795.09	51.	41.	0.021	87.16	1.500
AC-228	1821.62	911.29	35.	178.	0.089	26.11	1.760
AC-228	1936.81	968.90	33.	130.	0.065	32.17	1.541D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	2240.42	1120.72	68.	80.	0.040	62.65	1.005s
K-40	2921.13	1461.13	40.	1137.	0.568	9.20	1.752
BI-214	3528.77	1765.01	8.	43.	0.021	52.61	1.505

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		9.7864E-03					
			477.56	9.786E-03	%(	2.523E-01 7.27E-02	G
K-40		1.2873E+01					
			1460.75	1.287E+01	(P	3.658E-01 4.01E-01	G
MN-54		1.6279E-02					
			834.81	1.628E-02	%(P	3.357E-02 1.02E-02	G
CO-57		-3.4013E-03					
			122.07	-3.401E-03	%(P	4.088E-02 1.22E-02	G K
			136.43	-1.165E-02	&	3.429E-01 1.02E-01	G
CO-60		-6.6417E-03					
			1332.51	-6.642E-03	%(P	3.643E-02 9.99E-03	G K
			1173.23	2.686E-03	& P	4.376E-02 1.25E-02	G K
Sr-85		-1.4790E-02					
			514.00	-1.479E-02	%(	3.672E-02 1.11E-02	G
Kr-85		-3.3753E+02					
			513.99	-3.375E+02	%(	8.379E+02 2.52E+02	G
Y-88		-2.2151E-03					
			1836.01	-2.215E-03	%(P	2.081E-02 5.38E-03	G K
			898.02	3.637E-03	& P	2.720E-02 7.69E-03	G
NB-94		-2.4430E-03					
			871.10	-2.443E-03	%(	2.809E-02 7.97E-03	G K
			702.50	6.094E-03	&	2.710E-02 7.92E-03	G K
Ag-108M		-2.1017E-04					
			722.95	-2.102E-04	%(	3.549E-02 1.01E-02	G K
			614.37	-9.870E-03	% P	3.777E-02 1.12E-02	G
			433.93	1.926E-03	&	2.783E-02 8.07E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	1.1379E+00						
		88.04	1.138E+00	%(	1.615E+00	4.94E-01	G
SN-113	-5.8925E-03						
		391.71	-5.893E-03	%(	4.527E-02	1.33E-02	G K
		255.04	1.127E-01	&	1.446E+00	4.28E-01	G
SB-125	7.4072E-02						
		427.95	1.303E-02	&(P	8.476E-02	2.48E-02	G K
		600.77	-1.671E-02	% P	1.722E-01	5.01E-02	G
		636.15	6.099E-02	% P	2.219E-01	6.52E-02	G
		463.51	2.548E-01	*(P	2.839E-01	8.93E-02	G
		176.29	4.508E-02	%	5.015E-01	1.49E-01	G
I-131	1.5184E-03						
		364.48	1.518E-03	&(P	2.744E-02	7.91E-03	G K
		636.97	1.947E-01	&	3.793E-01	1.16E-01	G
		284.29	-1.827E-01	% P	5.055E-01	1.52E-01	G
CS-134	1.7759E-02						
		604.66	6.818E-04	%(	5.311E-02	1.56E-02	G K
		795.76	3.728E-02	(P	3.267E-02	1.09E-02	G
		569.29	-1.962E-02	& P	2.003E-01	5.76E-02	G
		801.84	-6.541E-02	% P	3.405E-01	9.70E-02	G
CS-137	3.6720E-02						
		661.62	3.672E-02	(P	3.514E-02	1.13E-02	G
CE-139	-7.5970E-03						
		165.85	-7.597E-03	%(	4.281E-02	1.28E-02	G
EU-152	-1.1607E-02						
		121.78	-1.161E-02	%(P	1.271E-01	3.78E-02	G K
		344.30	-1.214E-02	& P	1.015E-01	2.99E-02	G
		1408.08	4.273E-02	%	1.018E-01	3.05E-02	G
		964.00	1.561E-01	% P	2.646E-01	8.12E-02	G
		1112.07	7.102E-02	&	2.070E-01	6.12E-02	G
		778.90	4.884E-02	%	2.413E-01	7.05E-02	G
EU-154	-7.0848E-04						
		123.10	-7.085E-04	%(	8.885E-02	2.64E-02	G K
		1274.80	1.338E-02	%	1.014E-01	2.90E-02	G
		723.30	3.117E-02	%	1.028E-01	3.01E-02	G
		1004.80	-2.824E-02	%	1.699E-01	4.88E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.0848E-01						
		86.45	1.085E-01	%(	2.084E-01	6.33E-02	G K
		105.31	-1.027E-03	%	2.130E-01	6.33E-02	G
HG-203	1.7330E-04						
		279.17	1.733E-04	&(P	3.519E-02	1.03E-02	G K
		72.87	-2.292E-01	% P	1.971E+00	5.89E-01	G
		70.83	-1.188E+00	%	3.471E+00	1.05E+00	G
		82.50	2.699E-02	%	3.267E+00	9.70E-01	G
TL-208	2.0795E-01						
		583.14	2.079E-01	(P	3.281E-02	1.59E-02	G
		510.72	2.610E-01	+ P	1.506E-01	5.85E-02	G
PB-212	6.3575E-01						
		238.63	6.040E-01	(P	8.128E-02	3.43E-02	G K
							Energy duplication
		77.11	5.662E-01	} P	3.300E-01	8.75E-02	G
		74.81	4.782E-01	% P	6.768E-01	2.08E-01	G
PB-214	2.8731E-01						
		351.99	2.873E-01	(P	6.804E-02	2.88E-02	G K
		295.22	3.760E-01	+ P	1.333E-01	5.21E-02	G
							Energy duplication
		77.11	1.550E-01	} P	8.020E-01	1.93E-01	G
		241.92	1.903E+00	+	4.727E-01	1.66E-01	G
BI-212	6.0707E-01						
		727.17	6.071E-01	(P	2.894E-01	1.24E-01	G K
		1620.56	-2.126E-03	% P	9.895E-01	2.61E-01	G
		785.42	3.723E-01	%	1.678E+00	4.92E-01	G
BI-214	3.2806E-01						
		609.32	3.124E-01	(P	8.276E-02	3.86E-02	G K
		1764.51	3.734E-01	(P	1.429E-01	7.06E-02	G
		1120.28	5.309E-01	+ P	2.724E-01	1.14E-01	G
RA-224	7.0994E-01						
		241.00	7.099E-01	(	9.639E-01	2.96E-01	G
RA-226	7.4129E-01						
		185.99	7.413E-01	@(P	9.674E-01	2.96E-01	G
AC-228	5.2644E-01						
		911.07	5.264E-01	(P	8.883E-02	4.67E-02	G K
		968.90	6.682E-01	+ P	1.506E-01	7.17E-02	G
		338.40	8.218E-01	+ P	2.368E-01	1.00E-01	G

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

TH-227      -1.4157E-01
                          236.00-1.416E-01 %(  3.578E-01 1.08E-01 G K
                          256.25-2.368E-02 % P 4.454E-01 1.32E-01 G

PA-234      -2.2936E-03
                           98.44-2.294E-03 %(P 1.847E-01 5.47E-02 G K
                          946.00 1.134E-02 % P 1.456E-01 4.12E-02 G
                          131.28-5.893E-02 % P 1.964E-01 5.91E-02 G
                           94.67-1.135E-01 % P 3.660E-01 1.10E-01 G
                          883.24 8.063E-02 %   2.306E-01 6.85E-02 G
                          926.70 7.339E-02 &   2.431E-01 7.15E-02 G
                          569.26-2.908E-02 & P 2.968E-01 8.54E-02 G

TH-234       3.4278E-01
                           63.29-5.081E-01 %(P 5.312E+00 1.57E+00 G K
                           92.80 1.332E+00 % P 1.880E+00 5.72E-01 G
                           92.38 1.634E+00  (P 2.225E+00 6.78E-01 G

AM-241       1.4116E-01
                           59.54 1.412E-01 %(P 9.400E-01 2.80E-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

- -

***** 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	9.6503E-03	9.7864E-03	2.1813E-01	2.1813E-01	2.487E-01
K-40		1.2873E+01	1.2873E+01	1.2034E+00	1.4166E+00	
MN-54	#A	1.6240E-02	1.6279E-02	3.0541E-02	3.0556E-02	3.349E-02
CO-57	#B	-3.3919E-03	-3.4013E-03	3.9940E-02	3.9941E-02	4.077E-02
CO-60	#B	-6.6391E-03	-6.6417E-03	7.9305E-02	7.9306E-02	3.642E-02
Sr-85	#A	-1.4621E-02	-1.4790E-02	3.3189E-02	3.3200E-02	3.629E-02
Kr-85	#A	-3.3753E+02	-3.3753E+02	7.5740E+02	7.5766E+02	8.379E+02
Y-88	#B	-2.1997E-03	-2.2151E-03	1.7555E-02	1.7555E-02	2.067E-02
NB-94	#B	-2.4430E-03	-2.4430E-03	2.3913E-02	2.3914E-02	2.809E-02
Ag-108M	#B	-2.1017E-04	-2.1017E-04	3.0382E-02	3.0382E-02	3.549E-02
CD-109	#A	1.1360E+00	1.1379E+00	1.4833E+00	1.4847E+00	1.612E+00
SN-113	#B	-5.8544E-03	-5.8925E-03	3.9973E-02	3.9974E-02	4.498E-02
SB-125	#B	7.4018E-02	7.4072E-02	7.7904E-02	7.8022E-02	8.470E-02
I-131	#B	1.3835E-03	1.5184E-03	2.3718E-02	2.3718E-02	2.500E-02
CS-134	#B	1.7742E-02	1.7759E-02	1.5513E-02	1.5547E-02	5.306E-02
CS-137	#	3.6717E-02	3.6720E-02	3.4001E-02	3.4068E-02	3.513E-02
CE-139	#A	-7.5558E-03	-7.5970E-03	3.8429E-02	3.8432E-02	4.258E-02
EU-152	#B	-1.1605E-02	-1.1607E-02	1.3491E-01	1.3491E-01	1.270E-01
EU-154	#B	-7.0831E-04	-7.0848E-04	7.9065E-02	7.9065E-02	8.883E-02
EU-155	#B	1.0843E-01	1.0848E-01	1.8993E-01	1.9003E-01	2.083E-01
HG-203	#B	1.7054E-04	1.7330E-04	3.0995E-02	3.0995E-02	3.463E-02
TL-208		2.0795E-01	2.0795E-01	4.7760E-02	4.9263E-02	
PB-212		6.3575E-01	6.3575E-01	1.0837E-01	1.1448E-01	
PB-214		2.8731E-01	2.8731E-01	8.6362E-02	8.7958E-02	
BI-212		6.0707E-01	6.0707E-01	3.7129E-01	3.7296E-01	
BI-214		3.2806E-01	3.2806E-01	1.1102E-01	1.1264E-01	
RA-224	#A	7.0994E-01	7.0994E-01	8.8707E-01	8.8803E-01	9.639E-01
RA-226	#A	7.4129E-01	7.4129E-01	8.8745E-01	8.8849E-01	9.674E-01
AC-228		5.2644E-01	5.2644E-01	1.4007E-01	1.4336E-01	
TH-227	#B	-1.4157E-01	-1.4157E-01	3.2441E-01	3.2451E-01	3.578E-01
PA-234	#B	-2.2936E-03	-2.2936E-03	8.5184E-01	8.5184E-01	1.847E-01
TH-234	#B	3.4278E-01	3.4278E-01	4.2688E-01	4.2731E-01	5.312E+00
AM-241	#A	1.4116E-01	1.4116E-01	8.4069E-01	8.4073E-01	9.400E-01

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

H - Halflife limit exceeded

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

Total Activity (1120.0 to 2000.7 keV) 1.5465079E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.5465079E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_13JUL2006_1636.An1

Sample description
FSS-OOL-14-01-011-F

Spectrum Filename: C:\GammaVision\Spectra\103F_13JUL2006_1636.An1

Acquisition information
Start time: 13-Jul-2006 16:36:11
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: 1.6150E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6150E+03) =
6.1920E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

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

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

Corrections	Status	Comments
Decay correct to date:	YES	12-Jul-2006 11:27:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 18 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1661

***** 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
74.98	93.	26.27	0.99	9.052E-03	74.81	9.600	8.987E-01	PB212
77.28	170.	15.14	0.99	1.011E-02	77.11	17.500	9.340E-01	PB212
					77.11	10.700	1.528E+00	PB214
93.02	81.	40.41	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
93.04	80.	41.03	1.50	1.631E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	PBC<MDA	PA234
128.95	82.	39.18	0.91	2.436E-02				
186.49	148.	24.39	1.07	2.565E-02	185.99	3.280	1.342E+00	RA226
209.81	134.	22.93	1.19	2.469E-02				
238.75	998.	3.61	1.09	2.320E-02	238.63	43.100	8.254E-01	PB212
241.70	131.	21.42	1.09	2.304E-02	241.00	3.900	1.221E+00	RA224
					241.92	7.470	6.388E-01	PB214
269.86	84.	32.07	1.48	2.153E-02				
276.96	74.	36.31	0.65	2.116E-02				
295.18	204.	11.97	1.10	2.025E-02	295.22	19.200	4.308E-01	PB214
300.14	79.	31.43	0.98	2.001E-02				
327.90	49.	34.45	1.01	1.875E-02				
338.34	216.	14.61	0.99	1.830E-02	338.40	12.010	8.181E-01	AC228
351.89	338.	8.82	1.09	1.776E-02	351.99	37.100	4.222E-01	PB214
409.48	45.	34.41	1.50	1.575E-02				
462.69	88.	24.49	1.29	1.427E-02				
462.69	88.	24.49	1.29	1.427E-02	463.51	10.000	5.086E-01	SB125
511.01	175.	12.54	1.56	1.317E-02	510.72	22.500	4.193E-01	TL208
583.19	334.	6.71	1.34	1.184E-02	583.14	86.000	2.708E-01	TL208

609.42	233.	9.40	1.17	1.144E-02	609.32	46.090	3.589E-01	BI214
726.96	85.	19.92	1.49	9.967E-03	727.17	11.800	6.014E-01	BI212
794.96	67.	19.14	1.58	9.308E-03				
794.96	67.	19.14	1.58	9.308E-03	795.76	85.400	7.057E-02	CS134
860.42	62.	20.00	1.49	8.769E-03				
911.36	234.	8.49	1.73	8.399E-03	911.07	29.000	7.935E-01	AC228
964.47	55.	19.16	1.54	8.053E-03	964.00	14.580	3.851E-01	EU152
969.24	131.	10.46	1.54	8.023E-03	968.90	17.460	7.810E-01	AC228
1120.58	71.	22.36	2.09	7.210E-03	1120.28	15.040	5.347E-01	BI214
1238.42	55.	32.28	1.08	6.700E-03				

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1460.99	1076.	3.15	1.68	5.931E-03	1460.75	10.700	1.394E+01	K40
1588.30	48.	20.53	1.56	5.572E-03				
1621.25	25.	23.27	0.65	5.488E-03	1620.56	2.750	1.362E+00	BI212
1765.14	33.	16.67	0.91	5.142E-03	1764.51	15.920	3.346E-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	
257.07	128.95	411.	103.	0.052	88.48	0.913	AC-228	s
418.79	209.81	339.	134.	0.067	68.80	1.195	NP-239	s
538.88	269.86	254.	84.	0.042	96.22	1.482	AC-228	s
553.08	276.96	246.	74.	0.037	95.85	0.653	TL-208	s
599.42	300.14	224.	79.	0.040	94.30	0.979	PB-212	
654.94	327.90	118.	49.	0.024	103.36	1.006	AC-228	
818.10	409.48	95.	45.	0.023	103.23	1.498	AC-228	s
1719.88	860.42	34.	62.	0.031	60.01	1.494	TL-208	
1928.61	964.53	24.	59.	0.029	52.72	1.538	AC-228	D
2475.77	1238.42	78.	55.	0.027	96.83	1.080	CO-56	s
3175.42	1588.30	11.	48.	0.024	61.58	1.562	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	148.79	74.81	276.	93.	0.047	78.80	0.993D
PB-212	153.39	77.11	291.	170.	0.085	45.41	0.995A
RA-226	372.15	186.49	475.	135.	0.068	73.17	1.066s
PB-212	476.42	238.63	171.	982.	0.491	10.93	1.093D
PB-214	483.00	241.92	273.	87.	0.044	63.37	1.095A
PB-214	589.51	295.18	183.	200.	0.100	35.91	1.099
AC-228	675.82	338.34	261.	215.	0.107	43.83	0.990
PB-214	702.92	351.89	196.	332.	0.166	26.46	1.090s
SB-125	925.35	463.12	121.	71.	0.035	73.85	1.500s
TL-208	1021.14	511.01	136.	149.	0.074	37.62	1.564s
TL-208	1165.47	583.19	74.	330.	0.165	20.12	1.342
BI-214	1217.94	609.42	101.	226.	0.113	28.20	1.167
BI-212	1452.99	726.96	72.	85.	0.042	59.75	1.485
CS-134	1589.26	795.10	49.	58.	0.029	64.42	1.500s
AC-228	1821.76	911.36	61.	231.	0.116	25.46	1.728

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-152	1929.00	964.99	37.	57.	0.029	59.34	1.538
AC-228	1936.81	968.90	30.	131.	0.066	31.54	1.541D
BI-214	2240.13	1120.58	61.	69.	0.035	67.08	2.090s
K-40	2920.86	1460.99	37.	1058.	0.529	9.46	1.679
BI-212	3241.31	1621.25	2.	25.	0.012	69.80	0.648s
BI-214	3529.03	1765.14	3.	33.	0.016	50.00	0.906s

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		6.4155E-02					
			477.56	6.416E-02	%(	3.127E-01 9.21E-02	G
K-40		1.3943E+01					
			1460.75	1.394E+01	(P	4.110E-01 4.48E-01	G
MN-54		2.0108E-04					
			834.81	2.011E-04	%(P	3.155E-02 8.80E-03	G
CO-57		2.1036E-02					
			122.07	2.104E-02	%(P	5.017E-02 1.52E-02	G K
			136.43	5.186E-02	%	3.736E-01 1.12E-01	G
CO-60		-5.1839E-03					
			1332.51	-5.184E-03	%(P	3.360E-02 8.72E-03	G K
			1173.23	-3.490E-03	& P	4.970E-02 1.39E-02	G K
Sr-85		-1.4103E-02					
			514.00	-1.410E-02	%(	4.204E-02 1.26E-02	G
Kr-85		-3.2140E+02					
			513.99	-3.214E+02	%(	9.579E+02 2.87E+02	G
Y-88		-1.0722E-04					
			1836.01	-1.072E-04	%(P	1.255E-02 1.70E-03	G K
			898.02	1.291E-02	% P	3.342E-02 9.95E-03	G
NB-94		1.4532E-03					
			871.10	1.453E-03	&(	3.728E-02 1.06E-02	G K
			702.50	1.141E-02	%	3.497E-02 1.04E-02	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-1.3288E-02						
		722.95	-1.329E-02	%(	4.744E-02	1.41E-02	G K
		614.37	-1.160E-02	% P	4.185E-02	1.24E-02	G
		433.93	-6.595E-04	&	3.431E-02	9.92E-03	G
CD-109	1.0417E+00						
		88.04	1.042E+00	%(	1.999E+00	6.07E-01	G
SN-113	-5.5090E-03						
		391.71	-5.509E-03	&(	5.082E-02	1.49E-02	G K
		255.04	-1.998E-02	%	1.665E+00	4.91E-01	G
SB-125	1.0931E-01						
		427.95	6.228E-03	%(P	1.048E-01	3.05E-02	G K
		600.77	-5.584E-05	% P	1.928E-01	5.53E-02	G
		636.15	7.953E-02	% P	2.985E-01	8.80E-02	G
		463.51	4.144E-01	*(P	3.178E-01	1.04E-01	G
		176.29	0.000E+00	%	5.637E-01	1.67E-01	G
I-131	-7.8543E-03						
		364.48	-7.854E-03	&(P	4.323E-02	1.27E-02	G K
		636.97	-3.604E-03	&	5.332E-01	1.52E-01	G
		284.29	5.013E-02	& P	5.336E-01	1.57E-01	G
CS-134	2.7837E-02						
		604.66	-1.588E-03	&(	7.044E-02	2.08E-02	G K
		795.76	6.147E-02	(P	3.742E-02	1.32E-02	G
		569.29	7.902E-03	% P	2.309E-01	6.64E-02	G
		801.84	5.339E-02	& P	3.420E-01	9.72E-02	G
CS-137	6.8364E-04						
		661.62	6.836E-04	&(P	4.440E-02	1.27E-02	G
CE-139	6.1720E-03						
		165.85	6.172E-03	&(	4.358E-02	1.30E-02	G
EU-152	1.7632E-01						
		121.78	6.078E-02	%(P	1.468E-01	4.44E-02	G K
		344.30	7.019E-03	% P	1.170E-01	3.43E-02	G
		1408.08	7.338E-02	%	1.485E-01	4.53E-02	G
		964.00	4.080E-01	&(P	2.214E-01	8.15E-02	G
		1112.07	3.763E-02	&	2.956E-01	8.46E-02	G
		778.90	-3.610E-02	%	2.403E-01	6.91E-02	G
EU-154	4.4350E-02						
		123.10	4.435E-02	&(	9.964E-02	3.02E-02	G K
		1274.80	-2.743E-02	&	1.302E-01	3.79E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          723.30-5.889E-02 %   2.125E-01 6.30E-02 G
                         1004.80-4.078E-02 &   2.439E-01 7.08E-02 G

EU-155       1.3888E-01
                           86.45 1.389E-01 &(  2.346E-01 7.15E-02 G K
                          105.31 4.579E-02 %   2.337E-01 7.00E-02 G

HG-203      -8.4301E-04
                          279.17-8.430E-04 &(P 3.830E-02 1.12E-02 G K
                           72.87-1.617E-01 % P 1.804E+00 5.36E-01 G
                           70.83-1.278E+00 %   4.342E+00 1.31E+00 G
                           82.50-5.628E-01 %   3.820E+00 1.14E+00 G

TL-208       2.7082E-01
                          583.14 2.708E-01  (P 3.522E-02 1.84E-02 G
                          510.72 4.193E-01 + P 1.613E-01 6.21E-02 G

PB-212       8.6044E-01
                          238.63 8.220E-01  (P 5.329E-02 3.03E-02 G K
                                                          Energy duplication
                           77.11 8.036E-01 } P 3.889E-01 1.22E-01 G
                           74.81 8.987E-01  (P 7.711E-01 2.44E-01 G

PB-214       4.2515E-01
                          351.99 4.222E-01 *(P 8.625E-02 3.79E-02 G K
                          295.22 4.308E-01  (P 1.415E-01 5.26E-02 G
                                                          Energy duplication
                           77.11 0.000E+00 } P 9.078E-01 0.00E+00 G
                          241.92 4.252E-01 }   3.875E-01 8.98E-02 G

BI-212       6.0136E-01
                          727.17 6.014E-01  (P 3.016E-01 1.20E-01 G K
                         1620.56 1.362E+00 + P 5.543E-01 3.17E-01 G
                          785.42 9.545E-01 %   1.621E+00 5.00E-01 G

BI-214       3.5263E-01
                          609.32 3.589E-01  (P 7.858E-02 3.47E-02 G K
                         1764.51 3.346E-01  (P 1.139E-01 6.13E-02 G
                         1120.28 5.347E-01 + P 3.010E-01 1.23E-01 G

RA-224       8.8248E-01
                                                          Derived Ave Activity
                          241.00 8.825E-01 }(  1.233E+00 3.89E-01 G

RA-226       1.3423E+00
                          185.99 1.342E+00 *(P 1.036E+00 3.59E-01 G

AC-228       7.9551E-01
                          911.07 7.935E-01  (P 1.343E-01 6.83E-02 G K
                          968.90 7.834E-01  (P 1.681E-01 8.25E-02 G
```

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          338.40 8.181E-01  (P 2.970E-01 1.20E-01 G

TH-227       1.0222E-02
                          236.00 1.022E-02 &(  4.512E-01 1.34E-01 G K
                          256.25-8.154E-02 % P 5.154E-01 1.53E-01 G

PA-234      -1.4717E-02
                           98.44-1.472E-02 &(P 2.237E-01 6.65E-02 G K
                          946.00 6.345E-03 & P 1.667E-01 4.67E-02 G
                          131.28-7.039E-02 % P 2.162E-01 6.51E-02 G
                           94.67-1.918E-02 % P 3.537E-01 1.05E-01 G
                          883.24 9.714E-02 &   2.336E-01 7.01E-02 G
                          926.70 1.395E-02 %   3.397E-01 9.62E-02 G
                          569.26 1.145E-02 % P 3.422E-01 9.84E-02 G

TH-234       2.3621E-01
                           63.29 2.362E-01 %(P 6.232E+00 1.84E+00 G K
                           92.80 1.365E+00 % P 2.217E+00 6.72E-01 G
                           92.38 1.602E+00 % P 2.645E+00 8.02E-01 G

AM-241       8.9087E-02
                           59.54 8.909E-02 %(P 1.083E+00 3.22E-01 G
   ( - This peak used in the nuclide activity average.

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

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
```

M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded
A - Not in Average
C - Coincidence Peak

- -

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

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	6.3152E-02	6.4155E-02	2.7634E-01	2.7637E-01	3.078E-01
K-40		1.3943E+01	1.3943E+01	1.3427E+00	1.5679E+00	
MN-54	#A	2.0054E-04	2.0108E-04	2.6397E-02	2.6397E-02	3.147E-02
CO-57	#B	2.0970E-02	2.1036E-02	4.5517E-02	4.5532E-02	5.002E-02
CO-60	#B	-5.1817E-03	-5.1839E-03	1.3400E-01	1.3400E-01	3.359E-02
Sr-85	#A	-1.3921E-02	-1.4103E-02	3.7776E-02	3.7785E-02	4.149E-02
Kr-85	#A	-3.2140E+02	-3.2140E+02	8.6083E+02	8.6103E+02	9.579E+02
Y-88	#B	-1.0637E-04	-1.0722E-04	6.4331E-04	6.4334E-04	1.245E-02
NB-94	#B	1.4532E-03	1.4532E-03	3.1767E-02	3.1767E-02	3.728E-02
Ag-108M	#B	-1.3288E-02	-1.3288E-02	4.2237E-02	4.2244E-02	4.743E-02
CD-109	#A	1.0397E+00	1.0417E+00	1.8217E+00	1.8226E+00	1.995E+00
SN-113	#B	-5.4688E-03	-5.5090E-03	4.4734E-02	4.4735E-02	5.045E-02
SB-125	#F	1.0922E-01	1.0931E-01	8.2182E-02	8.2427E-02	1.047E-01
I-131	#B	-7.0734E-03	-7.8543E-03	4.2917E-02	4.2920E-02	3.893E-02
CS-134	#B	2.7806E-02	2.7837E-02	1.7960E-02	1.8033E-02	7.036E-02
CS-137	#A	6.8358E-04	6.8364E-04	3.8082E-02	3.8082E-02	4.440E-02
CE-139	#A	6.1343E-03	6.1720E-03	3.8972E-02	3.8973E-02	4.332E-02
EU-152	#F	1.7629E-01	1.7632E-01	1.0563E-01	1.0608E-01	1.468E-01
EU-154	#B	4.4338E-02	4.4350E-02	9.0505E-02	9.0538E-02	9.961E-02
EU-155	#B	1.3881E-01	1.3888E-01	2.1446E-01	2.1460E-01	2.345E-01
HG-203	#B	-8.2791E-04	-8.4301E-04	3.5258E-02	3.5258E-02	3.761E-02
TL-208		2.7082E-01	2.7082E-01	5.5213E-02	5.7409E-02	
PB-212		8.6044E-01	8.6044E-01	9.5208E-02	1.0752E-01	
PB-214		4.2515E-01	4.2515E-01	9.6643E-02	9.9746E-02	
BI-212		6.0136E-01	6.0136E-01	3.6142E-01	3.6310E-01	
BI-214		3.5263E-01	3.5263E-01	1.0229E-01	1.0432E-01	
RA-224	A	8.8248E-01	8.8248E-01	1.1433E+00	1.1444E+00	
RA-226	#	1.3423E+00	1.3423E+00	1.0763E+00	1.0792E+00	
AC-228		7.9551E-01	7.9551E-01	1.5922E-01	1.6578E-01	
TH-227	#B	1.0222E-02	1.0222E-02	4.0326E-01	4.0326E-01	4.512E-01
PA-234	#B	-1.4717E-02	-1.4717E-02	2.5544E-01	2.5544E-01	2.237E-01
TH-234	#B	2.3621E-01	2.3621E-01	5.5292E+00	5.5292E+00	6.232E+00
AM-241	#A	8.9086E-02	8.9087E-02	9.6467E-01	9.6468E-01	1.083E+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) 1.9473921E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.9473923E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_13JUL2006_1713.An1

Sample description
FSS-OOL-14-01-014-F

Spectrum Filename: C:\GammaVision\Spectra\103F_13JUL2006_1713.An1

Acquisition information
Start time: 13-Jul-2006 17:13:26
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: 1.5360E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5360E+03) =
6.5104E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

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

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

Corrections	Status	Comments
Decay correct to date:	YES	12-Jul-2006 13:44:00
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: 0.2197

***** 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
74.99	101.	23.59	0.99	9.052E-03	74.81	9.600	1.027E+00	PB212
77.29	115.	21.95	0.99	1.011E-02	77.11	17.500	7.982E-01	PB212
					77.11	10.700	1.305E+00	PB214
92.93	86.	33.98	1.50	1.631E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	PBC<MDA	PA234
92.93	82.	35.23	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
129.20	97.	36.59	1.56	2.439E-02				
129.20	97.	36.59	1.56	2.439E-02	131.28	20.000	PBC<MDA	PA234
186.29	107.	29.18	1.23	2.566E-02	185.99	3.280	PBC<MDA	RA226
209.43	66.	38.44	0.74	2.471E-02				
238.71	813.	4.04	1.09	2.320E-02	238.63	43.100	7.051E-01	PB212
					241.92	7.470	4.161E+00	PB214
269.91	86.	27.43	1.17	2.153E-02				
295.23	232.	11.64	1.10	2.025E-02	295.22	19.200	5.149E-01	PB214
327.66	56.	34.07	0.89	1.876E-02				
338.44	198.	15.54	1.39	1.830E-02	338.40	12.010	7.894E-01	AC228
351.91	341.	9.03	1.24	1.776E-02	351.99	37.100	4.480E-01	PB214
463.09	88.	25.14	1.09	1.426E-02				
463.09	88.	25.14	1.09	1.426E-02	463.51	10.000	5.366E-01	SB125
510.95	130.	13.21	1.59	1.317E-02	510.72	22.500	3.067E-01	TL208
583.27	300.	9.24	1.17	1.184E-02	583.14	86.000	2.555E-01	TL208
609.48	249.	8.32	0.96	1.144E-02	609.32	46.090	4.042E-01	BI214
661.95	98.	18.60	1.48	1.072E-02	661.62	84.620	9.408E-02	CS137
727.85	107.	16.76	1.68	9.958E-03	727.17	11.800	7.939E-01	BI212

911.21	204.	9.18	1.90	8.400E-03	911.07	29.000	7.238E-01	AC228
968.60	127.	15.36	0.93	8.028E-03	968.90	17.460	7.952E-01	AC228
1121.62	52.	29.40	1.12	7.212E-03	1120.28	15.040	4.226E-01	BI214
1461.03	921.	3.41	1.93	5.931E-03	1460.75	10.700	1.251E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1621.02	18.	23.57	0.63	5.488E-03	1620.56	2.750	1.047E+00	BI212
1764.65	57.	13.25	1.55	5.141E-03	1764.51	15.920	5.775E-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	
418.02	209.43	275.	66.	0.033	115.31	0.737	AC-228	s
482.15	241.43	297.	99.	0.049	80.16	1.095	RA-224	lD
538.97	269.91	204.	86.	0.043	82.30	1.166	AC-228	s
654.46	327.66	136.	56.	0.028	102.20	0.886	AC-228	s

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

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	255.	101.	0.051	70.78	0.993D
PB-212	153.39	77.11	281.	115.	0.057	65.84	0.995A
TH-234	185.03	92.93	589.	86.	0.043	101.95	1.500
PA-234	257.96	129.40	415.	73.	0.036	122.36	1.500s
RA-226	371.75	186.29	387.	94.	0.047	87.55	1.227s
PB-212	476.71	238.78	434.	813.	0.406	15.95	1.127
PB-214	589.61	295.23	194.	228.	0.114	34.92	1.099s
AC-228	676.02	338.44	229.	197.	0.099	46.62	1.388s
PB-214	702.96	351.91	190.	335.	0.168	27.09	1.237
SB-125	925.31	463.09	108.	50.	0.025	96.08	1.500
TL-208	1021.02	510.95	93.	103.	0.052	39.64	1.586s
TL-208	1165.64	583.27	131.	296.	0.148	27.73	1.172s
BI-214	1218.05	609.48	73.	242.	0.121	24.95	0.962s
CS-137	1322.99	661.95	71.	97.	0.049	55.81	1.484s
BI-212	1454.77	727.85	65.	106.	0.053	50.27	1.680s
AC-228	1821.45	911.21	56.	200.	0.100	27.54	1.895s
AC-228	1936.21	968.60	70.	127.	0.063	46.09	0.925s
BI-214	2242.22	1121.62	68.	52.	0.026	88.19	1.124
K-40	2920.93	1461.03	36.	902.	0.451	10.22	1.934
BI-212	3240.86	1621.02	0.	18.	0.009	70.71	0.625s
BI-214	3528.06	1764.65	3.	54.	0.027	39.74	1.554

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

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

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		4.6868E-02					
			477.56	4.687E-02	%(	2.783E-01 8.12E-02	G
K-40		1.2509E+01					
			1460.75	1.251E+01	(P	4.225E-01 4.35E-01	G
MN-54		1.4802E-04					
			834.81	1.480E-04	%(P	3.621E-02 1.02E-02	G
CO-57		1.7015E-02					
			122.07	1.702E-02	&(P	4.723E-02 1.42E-02	G K
			136.43	1.042E-02	%	3.298E-01 9.75E-02	G
CO-60		-7.4151E-03					
			1332.51	-7.415E-03	%(P	4.118E-02 1.11E-02	G K
			1173.23	-2.461E-03	& P	5.748E-02 1.62E-02	G K
Sr-85		-1.6889E-02					
			514.00	-1.689E-02	%(	4.227E-02 1.27E-02	G
Kr-85		-3.8512E+02					
			513.99	-3.851E+02	%(	9.640E+02 2.90E+02	G
Y-88		2.1806E-03					
			1836.01	2.181E-03	%(P	3.050E-02 8.02E-03	G K
			898.02	-2.247E-03	% P	3.877E-02 1.09E-02	G
NB-94		1.3191E-03					
			871.10	1.319E-03	&(	2.046E-02 5.50E-03	G K
			702.50	-3.767E-03	%	2.962E-02 8.47E-03	G K
Ag-108M		6.2464E-03					
			722.95	6.246E-03	&(	5.202E-02 1.52E-02	G K
			614.37	-1.033E-02	% P	4.469E-02 1.32E-02	G
			433.93	-1.992E-03	&	3.550E-02 1.03E-02	G
CD-109		-8.4070E-02					
			88.04	-8.407E-02	&(	2.011E+00 5.99E-01	G
SN-113		-7.4096E-03					
			391.71	-7.410E-03	%(	4.952E-02 1.45E-02	G K
			255.04	2.584E-01	&	1.538E+00 4.56E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	5.7092E-02						
		427.95	-2.712E-02	%(P	1.136E-01	3.37E-02	G K
		600.77	4.905E-02	% P	1.651E-01	4.88E-02	G
		636.15	-3.845E-02	& P	2.872E-01	8.25E-02	G
		463.51	3.064E-01	(P	3.167E-01	1.01E-01	G
		176.29	1.132E-02	&	5.417E-01	1.60E-01	G
I-131	1.2693E-02						
		364.48	1.269E-02	%(P	3.769E-02	1.13E-02	G K
		636.97	-5.203E-02	%	4.982E-01	1.43E-01	G
		284.29	1.848E-01	% P	5.032E-01	1.51E-01	G
CS-134	-1.6692E-03						
		604.66	-1.669E-03	%(	6.879E-02	2.03E-02	G K
		795.76	-9.669E-05	% P	4.009E-02	1.12E-02	G
		569.29	-1.171E-02	% P	1.906E-01	5.34E-02	G
		801.84	4.584E-02	% P	3.392E-01	9.56E-02	G
CS-137	9.4076E-02						
		661.62	9.408E-02	@(P	4.070E-02	1.78E-02	G
CE-139	-3.1313E-04						
		165.85	-3.131E-04	%(	4.133E-02	1.22E-02	G
EU-152	-3.5633E-04						
		121.78	-3.563E-04	&(P	1.268E-01	3.74E-02	G K
		344.30	-1.053E-02	& P	1.097E-01	3.21E-02	G
		1408.08	6.264E-02	%	1.514E-01	4.53E-02	G
		964.00	2.055E-01	% P	2.942E-01	9.18E-02	G
		1112.07	9.230E-02	%	3.627E-01	1.07E-01	G
		778.90	-6.027E-02	%	2.843E-01	8.30E-02	G
EU-154	3.2226E-02						
		123.10	3.223E-02	%(	1.065E-01	3.20E-02	G K
		1274.80	3.568E-02	%	1.138E-01	3.35E-02	G
		723.30	-9.125E-02	%	2.528E-01	7.58E-02	G
		1004.80	-4.958E-02	%	2.186E-01	6.36E-02	G
EU-155	1.1730E-01						
		86.45	1.173E-01	%(	2.359E-01	7.16E-02	G K
		105.31	5.842E-02	%	2.218E-01	6.66E-02	G
HG-203	1.5958E-02						
		279.17	1.596E-02	&(P	3.499E-02	1.06E-02	G K
		72.87	-3.067E-02	% P	2.630E+00	7.84E-01	G
		70.83	2.192E+00	&	3.592E+00	1.10E+00	G
		82.50	-1.502E+00	%	3.971E+00	1.20E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.6610E-01						
		583.14	2.555E-01	(P	4.844E-02	2.40E-02	G
		510.72	3.067E-01	*(P	1.412E-01	5.10E-02	G
PB-212	7.3906E-01						
		238.63	7.150E-01	(P	8.784E-02	3.86E-02	G K
							Energy duplication
		77.11	5.700E-01	} P	4.020E-01	1.25E-01	G
		74.81	1.027E+00	+ P	7.810E-01	2.50E-01	G
PB-214	4.7081E-01						
		351.99	4.480E-01	(P	8.934E-02	4.11E-02	G K
		295.22	5.149E-01	@(P	1.532E-01	6.10E-02	G
							Energy duplication
		77.11	2.868E-01	} P	9.458E-01	2.26E-01	G
		241.92	5.425E-02	%	5.536E-01	1.65E-01	G
BI-212	8.4170E-01						
		727.17	7.939E-01	*(P	3.012E-01	1.34E-01	G K
		1620.56	1.047E+00	(P	4.297E-01	2.47E-01	G
		785.42	4.019E-01	%	1.702E+00	4.97E-01	G
BI-214	4.0874E-01						
		609.32	4.042E-01	@(P	7.086E-02	3.45E-02	G K
		1764.51	5.775E-01	+ P	1.197E-01	8.11E-02	G
		1120.28	4.226E-01	(P	3.334E-01	1.29E-01	G
RA-224	6.7851E-01						
		241.00	6.785E-01	&(	1.081E+00	3.30E-01	G
RA-226	9.7864E-01						
		185.99	9.786E-01	(P	9.868E-01	3.25E-01	G
AC-228	7.5857E-01						
		911.07	7.238E-01	(P	1.352E-01	6.76E-02	G K
		968.90	7.952E-01	(P	2.624E-01	1.22E-01	G
		338.40	7.894E-01	@(P	2.930E-01	1.23E-01	G
TH-227	-2.8084E-01						
		236.00	-2.808E-01	%(	4.296E-01	1.31E-01	G K
		256.25	-2.332E-03	% P	4.661E-01	1.37E-01	G
PA-234	1.1066E-01						
		98.44	9.485E-02	%(P	2.062E-01	6.25E-02	G K
		946.00	6.011E-03	& P	1.743E-01	4.88E-02	G
		131.28	1.305E-01	?(P	1.745E-01	5.37E-02	G
		94.67	-2.852E-02	% P	3.708E-01	1.10E-01	G
		883.24	6.619E-03	%	2.149E-01	5.87E-02	G
		926.70	-4.012E-02	&	3.709E-01	1.06E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-2.732E-02 % P 2.732E-01 7.68E-02 G

TH-234       2.7440E+00
                           63.29 3.359E+00 %(P 6.066E+00 1.84E+00 G K
                           92.80 1.458E+00 % P 2.052E+00 6.25E-01 G
                           92.38 1.811E+00 &(P 2.432E+00 7.41E-01 G

AM-241      -1.4992E-01
                           59.54-1.499E-01 %(P 1.126E+00 3.35E-01 G
   ( - This peak used in the nuclide activity average.

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

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

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

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	4.6177E-02	4.6868E-02	2.4345E-01	2.4347E-01	2.742E-01
K-40		1.2509E+01	1.2509E+01	1.3051E+00	1.4936E+00	
MN-54	#A	1.4764E-04	1.4802E-04	3.0510E-02	3.0510E-02	3.612E-02
CO-57	#B	1.6965E-02	1.7015E-02	4.2702E-02	4.2712E-02	4.709E-02
CO-60	#B	-7.4120E-03	-7.4151E-03	9.8858E-02	9.8859E-02	4.116E-02

Sr-85	#A	-1.6684E-02	-1.6889E-02	3.8183E-02	3.8196E-02	4.176E-02
Kr-85	#A	-3.8512E+02	-3.8512E+02	8.7076E+02	8.7104E+02	9.640E+02
Y-88	#B	2.1644E-03	2.1806E-03	2.4052E-02	2.4052E-02	3.027E-02
NB-94	#B	1.3191E-03	1.3191E-03	1.6501E-02	1.6502E-02	2.046E-02
Ag-108M	#B	6.2463E-03	6.2464E-03	4.5570E-02	4.5572E-02	5.202E-02
CD-109	#A	-8.3923E-02	-8.4070E-02	1.7955E+00	1.7955E+00	2.008E+00
SN-113	#B	-7.3587E-03	-7.4096E-03	4.3647E-02	4.3649E-02	4.918E-02
SB-125	#B	5.7047E-02	5.7092E-02	5.6266E-02	5.6364E-02	1.135E-01
I-131	#B	1.1500E-02	1.2693E-02	3.3755E-02	3.3763E-02	3.415E-02
CS-134	#B	-1.6675E-03	-1.6692E-03	6.0791E-02	6.0791E-02	6.872E-02
CS-137	#	9.4069E-02	9.4076E-02	5.3250E-02	5.3530E-02	
CE-139	#A	-3.1133E-04	-3.1313E-04	3.6597E-02	3.6597E-02	4.109E-02
EU-152	#B	-3.5627E-04	-3.5633E-04	2.0402E-01	2.0402E-01	1.268E-01
EU-154	#B	3.2218E-02	3.2226E-02	9.6119E-02	9.6136E-02	1.065E-01
EU-155	#B	1.1725E-01	1.1730E-01	2.1477E-01	2.1487E-01	2.358E-01
HG-203	#B	1.5688E-02	1.5958E-02	3.1766E-02	3.1779E-02	3.439E-02
TL-208	#	2.6610E-01	2.6610E-01	7.4871E-02	7.6449E-02	
PB-212		7.3906E-01	7.3906E-01	1.1964E-01	1.2710E-01	
PB-214		4.7081E-01	4.7081E-01	1.0585E-01	1.0932E-01	
BI-212	#	8.4170E-01	8.4170E-01	3.6631E-01	3.6955E-01	
BI-214		4.0874E-01	4.0874E-01	1.0469E-01	1.0735E-01	
RA-224	#A	6.7851E-01	6.7851E-01	9.9064E-01	9.9143E-01	1.081E+00
RA-226	#A	9.7864E-01	9.7864E-01	9.7529E-01	9.7694E-01	
AC-228		7.5857E-01	7.5857E-01	1.8077E-01	1.8606E-01	
TH-227	#B	-2.8084E-01	-2.8084E-01	3.9374E-01	3.9408E-01	4.296E-01
PA-234	#B	1.1066E-01	1.1066E-01	1.2888E-01	1.2903E-01	2.062E-01
TH-234	#B	2.7440E+00	2.7440E+00	2.8167E+00	2.8208E+00	6.066E+00
AM-241	#A	-1.4992E-01	-1.4992E-01	1.0344E+00	1.0345E+00	1.126E+00

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

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

Total Activity (87.4 to 2000.7 keV) 1.7066864E+01 pCi/gm
Total Decayed Activity (87.4 to 2000.7 keV) 1.7066870E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_13JUL2006_1758.An1

Sample description
FSS-OOL-14-01-010-F

Spectrum Filename: C:\GammaVision\Spectra\103F_13JUL2006_1758.An1

Acquisition information
Start time: 13-Jul-2006 17:58:56
Live time: 2000
Real time: 2001
Dead time: 0.07 %
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: 1.3730E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.3730E+03) =
7.2833E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

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

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

Corrections	Status	Comments
Decay correct to date:	YES	12-Jul-2006 11:45:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 18 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1038

***** 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	79.	29.12	0.99	9.052E-03	74.81	9.600	8.949E-01	PB212
77.22	78.	25.75	0.99	1.011E-02	77.11	17.500	6.769E-01	PB212
					77.11	10.700	1.107E+00	PB214
93.07	79.	36.60	1.50	1.631E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
93.07	75.	37.86	1.50	1.645E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.44	113.	25.03	1.17	2.565E-02	185.99	3.280	1.165E+00	RA226
209.74	78.	31.94	1.23	2.469E-02				
238.74	725.	4.35	1.09	2.320E-02	238.63	43.100	7.017E-01	PB212
241.85	116.	19.69	1.10	2.303E-02	241.00	3.900	1.273E+00	RA224
					241.92	7.470	6.663E-01	PB214
270.04	95.	27.69	1.20	2.152E-02				
277.33	54.	38.50	1.50	2.105E-02	279.17	81.500	PBC<MDA	HG203
295.23	153.	15.95	1.06	2.025E-02	295.22	19.200	3.771E-01	PB214
300.31	41.	39.85	0.64	2.000E-02				
338.41	152.	14.45	1.18	1.830E-02	338.40	12.010	6.748E-01	AC228
352.02	292.	8.23	1.05	1.775E-02	351.99	37.100	4.279E-01	PB214
463.29	58.	29.23	1.05	1.425E-02				
463.29	58.	29.23	1.05	1.425E-02	463.51	10.000	3.950E-01	SB125
510.84	132.	15.41	1.39	1.317E-02	510.72	22.500	3.498E-01	TL208
583.33	296.	8.80	1.35	1.184E-02	583.14	86.000	2.822E-01	TL208
609.40	194.	10.02	1.39	1.144E-02	609.32	46.090	3.501E-01	BI214
661.78	159.	10.66	1.35	1.072E-02	661.62	84.620	1.708E-01	CS137
727.55	40.	33.08	0.80	9.961E-03	727.17	11.800	3.265E-01	BI212
794.62	62.	20.22	1.40	9.311E-03				
794.62	62.	20.22	1.40	9.311E-03	795.76	85.400	7.718E-02	CS134

911.27	181.	12.11	1.40	8.400E-03	911.07	29.000	7.160E-01	AC228
964.50	37.	26.33	1.54	8.052E-03	964.00	14.580	PBC<MDA	EU152
969.13	100.	12.31	1.54	8.023E-03	968.90	17.460	7.022E-01	AC228
1120.60	65.	22.26	1.12	7.210E-03	1120.28	15.040	5.708E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1461.03	957.	3.30	1.71	5.931E-03	1460.75	10.700	1.454E+01	K40
1764.86	36.	19.25	1.25	5.141E-03	1764.51	15.920	3.935E-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
418.64	209.74	256.	78.	0.039	95.82	1.232	NP-239
539.23	270.04	223.	95.	0.048	83.08	1.200	AC-228 s
599.77	300.31	113.	41.	0.021	119.56	0.637	PB-212 s
1588.29	794.62	34.	64.	0.032	53.41	1.399	AC-228 s
1928.78	964.69	24.	43.	0.022	66.06	1.538	AC-228 D

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

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	248.	79.	0.040	87.37	0.993D
PB-212	153.39	77.11	260.	78.	0.039	77.25	0.995A
RA-226	371.84	186.34	411.	99.	0.050	80.59	1.500s
PB-212	476.75	238.80	473.	662.	0.331	18.77	1.072
RA-224	482.68	241.76	525.	101.	0.051	100.73	1.500
HG-203	553.81	277.33	186.	54.	0.027	115.49	1.500s
PB-214	589.60	295.23	181.	149.	0.074	47.85	1.063
AC-228	675.96	338.41	138.	151.	0.075	43.35	1.181
PB-214	703.18	352.02	125.	286.	0.143	24.69	1.051
SB-125	925.88	463.38	79.	46.	0.023	90.63	1.500
TL-208	1020.80	510.84	121.	105.	0.053	46.24	1.393s
TL-208	1165.76	583.33	103.	292.	0.146	26.41	1.346
BI-214	1217.90	609.40	74.	188.	0.094	30.05	1.389
CS-137	1322.64	661.78	55.	157.	0.079	31.98	1.353
BI-212	1454.13	727.53	58.	33.	0.016	110.06	1.500s
AC-228	1821.56	911.27	82.	177.	0.089	36.34	1.396
AC-228	1936.81	968.90	27.	100.	0.050	37.08	1.541D
BI-214	2240.18	1120.60	48.	63.	0.031	66.77	1.116s
K-40	2920.92	1461.03	28.	938.	0.469	9.89	1.709
BI-214	3528.47	1764.86	7.	33.	0.016	57.74	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		1.2704E-01					
			477.56	1.270E-01	%(	3.209E-01 9.64E-02	G
K-40		1.4545E+01					
			1460.75	1.454E+01	(P	4.245E-01 4.89E-01	G
MN-54		-2.1100E-03					
			834.81	-2.110E-03	%(P	4.250E-02 1.20E-02	G
CO-57		1.1558E-02					
			122.07	1.156E-02	&(P	5.226E-02 1.56E-02	G K
			136.43	5.148E-02	%	4.129E-01 1.23E-01	G
CO-60		-4.1082E-03					
			1332.51	-4.108E-03	%(P	3.436E-02 8.43E-03	G K
			1173.23	6.030E-03	% P	4.643E-02 1.31E-02	G K
Sr-85		-1.8951E-02					
			514.00	-1.895E-02	%(	5.006E-02 1.51E-02	G
Kr-85		-4.3159E+02					
			513.99	-4.316E+02	%(	1.140E+03 3.43E+02	G
Y-88		3.8573E-03					
			1836.01	3.857E-03	%(P	2.405E-02 6.28E-03	G K
			898.02	-7.039E-03	% P	4.262E-02 1.22E-02	G
NB-94		-1.1340E-02					
			871.10	-1.134E-02	%(	4.378E-02 1.29E-02	G K
			702.50	7.458E-03	%	4.025E-02 1.17E-02	G K
Ag-108M		-7.5741E-03					
			722.95	-7.574E-03	%(	4.216E-02 1.22E-02	G K
			614.37	-1.815E-02	% P	4.427E-02 1.33E-02	G
			433.93	-7.757E-04	&	4.013E-02 1.16E-02	G
CD-109		0.0000E+00					
			88.04	0.000E+00	&(	2.178E+00 6.47E-01	G
SN-113		4.0574E-03					
			391.71	4.057E-03	&(	5.445E-02 1.59E-02	G K
			255.04	2.285E-02	&	1.829E+00 5.38E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	8.3884E-02						
		427.95	5.235E-03	&(P	1.138E-01	3.29E-02	G K
		600.77	4.183E-02	% P	1.763E-01	5.16E-02	G
		636.15	-1.494E-02	& P	2.862E-01	8.04E-02	G
		463.51	3.167E-01	(P	3.049E-01	9.83E-02	G
		176.29	1.983E-01	%	5.807E-01	1.75E-01	G
I-131	-5.3287E-04						
		364.48	-5.329E-04	%(P	3.328E-02	9.41E-03	G K
		636.97	-8.765E-02	%	5.510E-01	1.60E-01	G
		284.29	-7.470E-02	% P	6.251E-01	1.84E-01	G
CS-134	-4.7664E-03						
		604.66	-4.766E-03	%(	3.994E-02	1.16E-02	G K
		795.76	-2.749E-03	% P	4.702E-02	1.34E-02	G
		569.29	-4.311E-02	% P	2.609E-01	7.54E-02	G
		801.84	7.681E-02	% P	3.828E-01	1.09E-01	G
CS-137	1.7077E-01						
		661.62	1.708E-01	(P	4.029E-02	1.84E-02	G
CE-139	-2.6920E-04						
		165.85	-2.692E-04	&(	4.797E-02	1.42E-02	G
EU-152	3.3483E-02						
		121.78	3.348E-02	%(P	1.528E-01	4.57E-02	G K
		344.30	-6.177E-03	& P	1.283E-01	3.74E-02	G
		1408.08	3.818E-02	%	1.523E-01	4.34E-02	G
		964.00	1.779E-01	% P	3.570E-01	1.08E-01	G
		1112.07	0.000E+00	%	3.880E-01	1.10E-01	G
		778.90	5.948E-02	&	2.779E-01	8.07E-02	G
EU-154	2.8540E-02						
		123.10	2.854E-02	&(	1.022E-01	3.07E-02	G K
		1274.80	-2.447E-02	%	1.373E-01	3.95E-02	G
		723.30	-3.183E-02	%	1.906E-01	5.52E-02	G
		1004.80	-7.102E-03	&	2.393E-01	6.71E-02	G
EU-155	1.7895E-02						
		86.45	1.790E-02	&(	2.186E-01	6.49E-02	G K
		105.31	8.431E-03	%	2.169E-01	6.41E-02	G
HG-203	3.1337E-02						
		279.17	3.134E-02	&(P	3.878E-02	1.21E-02	G K
		72.87	8.027E-01	& P	2.023E+00	6.11E-01	G
		70.83	3.328E-01	%	4.826E+00	1.44E+00	G
		82.50	-5.922E-02	&	4.180E+00	1.24E+00	G

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

TL-208       2.9623E-01
                          583.14 2.822E-01  (P 4.829E-02 2.52E-02 G
                          510.72 3.498E-01 *(P 1.790E-01 6.76E-02 G

PB-212       6.5925E-01
                          238.63 6.521E-01  (P 1.024E-01 4.15E-02 G K
                                                          Energy duplication
                           77.11 4.340E-01 } P 4.331E-01 1.12E-01 G
                           74.81 8.949E-01 + P 8.619E-01 2.71E-01 G

PB-214       4.1058E-01
                          351.99 4.279E-01  (P 8.179E-02 3.59E-02 G K
                          295.22 3.771E-01  (P 1.656E-01 6.18E-02 G
                                                          Energy duplication
                           77.11 3.147E-01 } P 1.018E+00 2.46E-01 G
                          241.92 3.316E-01 %   6.596E-01 2.00E-01 G

BI-212       2.7287E-01
                          727.17 2.729E-01 ?(P 3.188E-01 1.02E-01 G K
                         1620.56 1.257E-01 % P 1.107E+00 2.96E-01 G
                          785.42 4.324E-01 %   1.681E+00 4.91E-01 G

BI-214       3.6123E-01
                          609.32 3.501E-01  (P 8.013E-02 3.63E-02 G K
                         1764.51 3.935E-01  (P 1.837E-01 8.33E-02 G
                         1120.28 5.708E-01 + P 3.178E-01 1.31E-01 G

RA-224       1.1053E+00
                          241.00 1.105E+00  (  1.198E+00 3.71E-01 G

RA-226       1.1602E+00
                          185.99 1.160E+00 *(P 1.136E+00 3.52E-01 G

AC-228       7.0382E-01
                          911.07 7.160E-01  (P 1.812E-01 8.84E-02 G K
                          968.90 7.035E-01  (P 1.886E-01 8.71E-02 G
                          338.40 6.748E-01  (P 2.575E-01 9.82E-02 G

TH-227      -1.6806E-01
                          236.00-1.681E-01 &(  4.548E-01 1.37E-01 G K
                          256.25 7.311E-02 % P 5.035E-01 1.49E-01 G

PA-234      -1.9046E-02
                           98.44-1.905E-02 %(P 2.049E-01 6.06E-02 G K
                          946.00-1.272E-04 & P 2.693E-01 7.68E-02 G
                          131.28-4.697E-03 & P 1.994E-01 5.89E-02 G
                           94.67-6.618E-02 % P 4.397E-01 1.31E-01 G
                          883.24-1.537E-03 %   3.011E-01 8.36E-02 G
                          926.70 4.824E-02 %   2.895E-01 8.22E-02 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-5.703E-02 % P 3.734E-01 1.08E-01 G

TH-234       1.7205E-01
                           63.29 1.721E-01 &(P 7.045E+00 2.08E+00 G K
                           92.80 1.506E+00 % P 2.317E+00 7.03E-01 G
                           92.38 1.851E+00 % P 2.728E+00 8.29E-01 G

AM-241      -2.8060E-02
                           59.54-2.806E-02 &(P 1.238E+00 3.66E-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	1.2498E-01	1.2704E-01	2.8911E-01	2.8920E-01	3.157E-01
K-40		1.4545E+01	1.4545E+01	1.4673E+00	1.6929E+00	
MN-54	#A	-2.1041E-03	-2.1100E-03	5.2665E-02	5.2666E-02	4.238E-02
CO-57	#B	1.1521E-02	1.1558E-02	4.6901E-02	4.6905E-02	5.209E-02
CO-60	#B	-4.1064E-03	-4.1082E-03	7.2893E+01	7.2893E+01	3.435E-02

Sr-85	#A	-1.8698E-02	-1.8951E-02	4.5153E-02	4.5166E-02	4.939E-02
Kr-85	#A	-4.3159E+02	-4.3159E+02	1.0284E+03	1.0287E+03	1.140E+03
Y-88	#B	3.8259E-03	3.8573E-03	1.8835E-02	1.8837E-02	2.386E-02
NB-94	#B	-1.1340E-02	-1.1340E-02	3.8593E-02	3.8599E-02	4.378E-02
Ag-108M	#B	-7.5740E-03	-7.5741E-03	3.6729E-02	3.6732E-02	4.216E-02
CD-109	#A	0.0000E+00	0.0000E+00	1.9398E+00	1.9398E+00	2.174E+00
SN-113	#B	4.0267E-03	4.0574E-03	4.7602E-02	4.7603E-02	5.404E-02
SB-125	#B	8.3812E-02	8.3884E-02	7.8144E-02	7.8296E-02	1.137E-01
I-131	#B	-4.7803E-04	-5.3287E-04	1.5010E+01	1.5010E+01	2.986E-02
CS-134	#B	-4.7608E-03	-4.7664E-03	3.4743E-02	3.4744E-02	3.989E-02
CS-137		1.7076E-01	1.7077E-01	5.5086E-02	5.5971E-02	
CE-139	#A	-2.6749E-04	-2.6920E-04	4.2517E-02	4.2517E-02	4.767E-02
EU-152	#B	3.3477E-02	3.3483E-02	1.3713E-01	1.3714E-01	1.528E-01
EU-154	#B	2.8532E-02	2.8540E-02	9.1965E-02	9.1978E-02	1.022E-01
EU-155	#B	1.7887E-02	1.7895E-02	1.9468E-01	1.9468E-01	2.185E-01
HG-203	#A	3.0755E-02	3.1337E-02	3.6218E-02	3.6263E-02	3.806E-02
TL-208		2.9623E-01	2.9623E-01	7.9394E-02	8.1235E-02	
PB-212		6.5925E-01	6.5925E-01	1.2596E-01	1.3164E-01	
PB-214		4.1058E-01	4.1058E-01	1.0338E-01	1.0609E-01	
BI-212	#A	2.7287E-01	2.7287E-01	3.0487E-01	3.0528E-01	3.188E-01
BI-214		3.6123E-01	3.6123E-01	1.1229E-01	1.1423E-01	
RA-224	A	1.1053E+00	1.1053E+00	1.1133E+00	1.1152E+00	1.198E+00
RA-226	#	1.1602E+00	1.1602E+00	1.0571E+00	1.0592E+00	1.136E+00
AC-228		7.0382E-01	7.0382E-01	1.6008E-01	1.6522E-01	
TH-227	#B	-1.6806E-01	-1.6806E-01	4.1179E-01	4.1190E-01	4.548E-01
PA-234	#B	-1.9046E-02	-1.9046E-02	2.2760E-01	2.2761E-01	2.049E-01
TH-234	#B	1.7205E-01	1.7205E-01	6.2384E+00	6.2384E+00	7.045E+00
AM-241	#A	-2.8060E-02	-2.8060E-02	1.3036E+00	1.3036E+00	1.238E+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) 1.8524778E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.8524792E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_17JUL2006_1842.An1

Sample description
FSS-OOL-14-01-021-F

Spectrum Filename: C:\GammaVision\Spectra\103F_17JUL2006_1842.An1

Acquisition information
Start time: 17-Jul-2006 18:42:43
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: 1.8370E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8370E+03) =
5.4437E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

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

YAEC Chemistry Lab Spectrum name: 103F_17JUL2006_1842.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	13-Jul-2006 09:25:00
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: 0.1308

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.90	77.	34.71	0.99	9.052E-03	74.81	9.600	PBC<MDA	PB212
77.20	140.	20.33	0.99	1.011E-02	77.11	17.500	8.126E-01	PB212
					77.11	10.700	1.329E+00	PB214
186.29	151.	17.30	1.06	2.565E-02	185.99	3.280	1.203E+00	RA226
209.10	126.	30.26	0.99	2.472E-02				
238.94	1013.	3.85	1.09	2.318E-02	238.63	43.100	7.363E-01	PB212
242.14	142.	17.74	1.10	2.301E-02	241.00	3.900	1.163E+00	RA224
					241.92	7.470	6.087E-01	PB214
269.86	106.	32.32	0.99	2.153E-02				
295.33	247.	11.71	1.14	2.024E-02	295.22	19.200	4.595E-01	PB214
328.23	48.	35.40	1.15	1.875E-02				
338.38	216.	13.50	1.35	1.830E-02	338.40	12.010	7.186E-01	AC228
351.99	441.	7.19	1.08	1.775E-02	351.99	37.100	4.867E-01	PB214
462.99	53.	31.61	1.05	1.426E-02				
462.99	53.	31.61	1.05	1.426E-02	463.51	10.000	PBC<MDA	SB125
510.64	168.	13.36	1.99	1.317E-02	510.72	22.500	3.518E-01	TL208
583.32	339.	8.78	1.32	1.184E-02	583.14	86.000	2.420E-01	TL208
609.46	412.	7.48	1.10	1.144E-02	609.32	46.090	5.661E-01	BI214
661.41	315.	8.92	1.58	1.072E-02	661.62	84.620	2.545E-01	CS137
727.63	100.	20.30	1.40	9.960E-03	727.17	11.800	6.225E-01	BI212
794.84	61.	31.59	1.55	9.309E-03				
794.84	61.	31.59	1.55	9.309E-03	795.76	85.400	5.683E-02	CS134
911.24	257.	7.86	1.62	8.400E-03	911.07	29.000	7.658E-01	AC228
967.99	192.	11.42	1.54	8.031E-03	968.90	17.460	1.009E+00	AC228
1120.57	41.	32.64	1.63	7.212E-03	1120.28	15.040	PBC<MDA	BI214
1173.65	88.	20.39	1.47	6.970E-03	1173.23	99.860	9.107E-02	CO60
1332.16	82.	18.81	1.58	6.351E-03	1332.51	99.980	9.210E-02	CO60

1461.12	1238.	2.98	1.76	5.931E-03	1460.75	10.700	1.413E+01	K40
1765.03	66.	13.53	0.94	5.141E-03	1764.51	15.920	5.619E-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	209.10	536.	126.	0.063	90.78	0.993	AC-228	
538.87	269.86	400.	106.	0.053	96.97	0.987	AC-228	s
654.75	327.80	228.	63.	0.032	119.81	1.239	AC-228	
1218.01	609.46	449.	109.	0.055	87.17	1.102	BI-214	

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	351.	77.	0.039	104.14	0.993D
PB-212	153.39	77.11	360.	140.	0.070	61.00	0.995A
RA-226	371.59	186.21	694.	147.	0.074	73.04	1.500
PB-212	477.12	238.98	653.	1035.	0.518	15.10	0.973
RA-224	483.05	241.95	726.	115.	0.058	103.23	1.500
PB-214	589.81	295.33	260.	243.	0.121	35.13	1.141
AC-228	675.90	338.38	244.	215.	0.107	40.49	1.354
PB-214	703.11	351.99	223.	436.	0.218	21.57	1.079
SB-125	925.05	462.97	148.	66.	0.033	84.98	1.500
TL-208	1020.39	510.64	147.	142.	0.071	40.08	1.987s
TL-208	1165.73	583.32	176.	335.	0.168	26.35	1.324
BI-214	1218.03	609.47	141.	316.	0.158	22.63	1.500
CS-137	1321.92	661.41	123.	314.	0.157	26.76	1.581
BI-212	1454.34	727.63	104.	100.	0.050	60.89	1.402s
CS-134	1589.43	795.19	72.	45.	0.022	91.62	1.500
AC-228	1821.51	911.24	57.	254.	0.127	23.58	1.618
AC-228	1935.00	967.99	81.	192.	0.096	34.25	1.535s
BI-214	2240.11	1120.57	80.	41.	0.021	97.92	1.634
CO-60	2346.25	1173.65	80.	86.	0.043	61.17	1.466s
CO-60	2663.24	1332.16	42.	79.	0.040	56.44	1.585s
K-40	2921.11	1461.12	49.	1219.	0.610	8.93	1.759
BI-214	3528.38	1764.81	12.	46.	0.023	49.41	2.033s

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

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

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		5.6593E-02					
			477.56	5.659E-02	%(	3.435E-01 1.01E-01	G
K-40		1.4131E+01					
			1460.75	1.413E+01	(P	4.084E-01 4.27E-01	G
MN-54		9.2127E-03					
			834.81	9.213E-03	%(P	3.677E-02 1.08E-02	G
CO-57		-3.1250E-04					
			122.07	-3.125E-04	%(P	5.101E-02 1.52E-02	G K
			136.43	-5.214E-02	&	3.835E-01 1.15E-01	G
CO-60		9.1588E-02					
			1332.51	9.210E-02	@(P	3.805E-02 1.79E-02	G K
			1173.23	9.107E-02	@(P	4.697E-02 1.90E-02	G K
Sr-85		-2.1110E-02					
			514.00	-2.111E-02	%(	4.482E-02 1.36E-02	G
Kr-85		-4.6502E+02					
			513.99	-4.650E+02	%(	9.874E+02 2.99E+02	G
Y-88		2.6863E-03					
			1836.01	2.686E-03	%(P	1.865E-02 4.83E-03	G K
			898.02	-1.327E-03	% P	3.085E-02 8.56E-03	G
NB-94		-7.9370E-03					
			871.10	-7.937E-03	%(	3.556E-02 1.04E-02	G K
			702.50	4.107E-03	&	3.263E-02 9.47E-03	G K
Ag-108M		-1.5177E-02					
			722.95	-1.518E-02	&(	4.928E-02 1.47E-02	G K
			614.37	-1.413E-02	% P	4.365E-02 1.30E-02	G
			433.93	8.513E-03	%	3.293E-02 9.79E-03	G
CD-109		9.0506E-01					
			88.04	9.051E-01	%(	1.869E+00 5.67E-01	G
SN-113		-4.1229E-03					
			391.71	-4.123E-03	%(	5.091E-02 1.50E-02	G K
			255.04	5.222E-02	&	1.704E+00 5.05E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	9.8543E-02						
		427.95	1.662E-02	%(P	1.030E-01	3.04E-02	G K
		600.77	-4.660E-02	& P	1.808E-01	5.35E-02	G
		636.15	4.302E-02	% P	2.400E-01	6.96E-02	G
		463.51	3.410E-01	(P	3.081E-01	9.85E-02	G
		176.29	-1.039E-01	&	4.914E-01	1.47E-01	G
I-131	1.0209E-02						
		364.48	1.021E-02	&(P	5.639E-02	1.67E-02	G K
		636.97	6.110E-02	%	5.965E-01	1.72E-01	G
		284.29	3.146E-01	% P	7.263E-01	2.20E-01	G
CS-134	1.3810E-02						
		604.66	-1.071E-02	%(	4.002E-02	1.19E-02	G K
		795.76	4.184E-02	(P	3.937E-02	1.28E-02	G
		569.29	-6.038E-02	% P	2.434E-01	7.17E-02	G
		801.84	-9.157E-02	% P	4.317E-01	1.25E-01	G
CS-137	2.5450E-01						
		661.62	2.545E-01	(P	4.414E-02	2.28E-02	G
CE-139	-3.8414E-04						
		165.85	-3.841E-04	%(	4.660E-02	1.39E-02	G
EU-152	3.2494E-04						
		121.78	3.249E-04	%(P	1.481E-01	4.40E-02	G K
		344.30	4.255E-03	& P	9.188E-02	2.68E-02	G
		1408.08	3.910E-02	&	1.563E-01	4.53E-02	G
		964.00	2.156E-01	% P	2.980E-01	9.28E-02	G
		1112.07	4.026E-02	%	2.824E-01	8.14E-02	G
		778.90	-8.488E-02	&	2.935E-01	8.71E-02	G
EU-154	-2.0328E-02						
		123.10	-2.033E-02	%(	1.110E-01	3.33E-02	G K
		1274.80	4.397E-02	%	1.032E-01	3.11E-02	G
		723.30	-3.151E-02	%	2.346E-01	6.90E-02	G
		1004.80	-3.975E-02	&	2.336E-01	6.81E-02	G
EU-155	0.0000E+00						
		86.45	0.000E+00	%(	2.479E-01	7.39E-02	G K
		105.31	-6.277E-02	%	2.172E-01	6.53E-02	G
HG-203	1.8330E-02						
		279.17	1.833E-02	&(P	3.944E-02	1.19E-02	G K
		72.87	-3.579E-01	& P	2.352E+00	7.05E-01	G
		70.83	0.000E+00	&	4.623E+00	1.38E+00	G
		82.50	1.200E+00	&	3.776E+00	1.14E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.4199E-01						
		583.14	2.420E-01	(P	4.659E-02	2.15E-02	G
		510.72	3.518E-01	+ P	1.471E-01	5.58E-02	G
PB-212	7.7633E-01						
		238.63	7.616E-01	(P	8.960E-02	3.88E-02	G K
							Energy duplication
		77.11	5.830E-01	} P	3.790E-01	1.19E-01	G
		74.81	6.530E-01	- P	7.619E-01	2.36E-01	G
PB-214	4.7743E-01						
		351.99	4.867E-01	(P	8.079E-02	3.54E-02	G K
		295.22	4.595E-01	(P	1.474E-01	5.47E-02	G
							Energy duplication
		77.11	3.685E-01	} P	9.426E-01	2.21E-01	G
		241.92	3.447E-01	%	5.761E-01	1.76E-01	G
BI-212	6.2253E-01						
		727.17	6.225E-01	@(P	3.150E-01	1.27E-01	G K
		1620.56	1.761E-01	& P	1.017E+00	2.84E-01	G
		785.42	-3.506E-01	%	1.911E+00	5.60E-01	G
BI-214	4.3387E-01						
		609.32	4.411E-01	(P	8.106E-02	3.40E-02	G K
		1764.51	4.130E-01	@(P	1.665E-01	7.29E-02	G
		1120.28	2.808E-01	- P	3.013E-01	9.59E-02	G
RA-224	9.4079E-01						
		241.00	9.408E-01	(	1.049E+00	3.24E-01	G
RA-226	1.2873E+00						
		185.99	1.287E+00	(P	1.096E+00	3.41E-01	G
AC-228	7.5198E-01						
		911.07	7.658E-01	(P	1.148E-01	6.10E-02	G K
		968.90	1.009E+00	+ P	2.340E-01	1.15E-01	G
		338.40	7.186E-01	(P	2.528E-01	9.75E-02	G
TH-227	-1.8191E-01						
		236.00	-1.819E-01	&(	3.921E-01	1.19E-01	G K
		256.25	-1.189E-01	% P	4.761E-01	1.43E-01	G
PA-234	1.7133E-02						
		98.44	1.713E-02	%(P	2.241E-01	6.69E-02	G K
		946.00	-3.139E-02	% P	1.959E-01	5.70E-02	G
		131.28	-1.676E-02	& P	2.172E-01	6.48E-02	G
		94.67	-9.919E-02	& P	4.107E-01	1.23E-01	G
		883.24	7.649E-02	&	2.933E-01	8.64E-02	G
		926.70	9.731E-02	&	2.482E-01	7.42E-02	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-8.921E-02 % P 3.597E-01 1.06E-01 G

TH-234       1.0630E+00
                           63.29 1.063E+00 %(P 6.559E+00 1.96E+00 G K
                           92.80 1.057E+00 % P 2.164E+00 6.54E-01 G
                           92.38 1.318E+00 % P 2.556E+00 7.73E-01 G

AM-241      -5.1367E-02
                           59.54-5.137E-02 &(P 1.155E+00 3.44E-01 G
   ( - This peak used in the nuclide activity average.

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

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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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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	5.3460E-02	5.6593E-02	3.0388E-01	3.0389E-01	3.244E-01
K-40		1.4131E+01	1.4131E+01	1.2813E+00	1.5214E+00	
MN-54	#A	9.1234E-03	9.2127E-03	3.2472E-02	3.2476E-02	3.641E-02
CO-57	#B	-3.0900E-04	-3.1250E-04	1.4075E-01	1.4075E-01	5.044E-02
CO-60	#	9.1443E-02	9.1588E-02	3.9167E-02	3.9526E-02	

Sr-85	#A	-2.0143E-02	-2.1110E-02	4.0751E-02	4.0769E-02	4.277E-02
Kr-85	#A	-4.6500E+02	-4.6502E+02	8.9768E+02	8.9809E+02	9.873E+02
Y-88	#B	2.6108E-03	2.6863E-03	1.4496E-02	1.4497E-02	1.813E-02
NB-94	#B	-7.9370E-03	-7.9370E-03	3.1264E-02	3.1268E-02	3.556E-02
Ag-108M	#B	-1.5176E-02	-1.5177E-02	4.4142E-02	4.4150E-02	4.928E-02
CD-109	#A	8.9901E-01	9.0506E-01	1.7007E+00	1.7014E+00	1.856E+00
SN-113	#B	-4.0153E-03	-4.1229E-03	4.4872E-02	4.4872E-02	4.958E-02
SB-125	#B	9.8247E-02	9.8543E-02	8.5368E-02	8.5559E-02	1.027E-01
I-131	#B	6.9938E-03	1.0209E-02	5.0119E-02	5.0122E-02	3.863E-02
CS-134	#B	1.3754E-02	1.3810E-02	1.2678E-02	1.2703E-02	3.986E-02
CS-137		2.5443E-01	2.5450E-01	6.8394E-02	6.9972E-02	
CE-139	#A	-3.7574E-04	-3.8414E-04	4.1551E-02	4.1551E-02	4.558E-02
EU-152	#B	3.2473E-04	3.2494E-04	1.3213E-01	1.3213E-01	1.480E-01
EU-154	#B	-2.0308E-02	-2.0328E-02	9.9910E-02	9.9916E-02	1.109E-01
EU-155	#B	0.0000E+00	0.0000E+00	2.2173E-01	2.2173E-01	2.474E-01
HG-203	#B	1.7172E-02	1.8330E-02	3.5847E-02	3.5863E-02	3.695E-02
TL-208		2.4199E-01	2.4199E-01	6.4579E-02	6.6089E-02	
PB-212		7.7633E-01	7.7633E-01	1.1858E-01	1.2685E-01	
PB-214		4.7743E-01	4.7743E-01	9.9949E-02	1.0372E-01	
BI-212	#	6.2253E-01	6.2253E-01	3.8096E-01	3.8267E-01	
BI-214	#	4.3387E-01	4.3387E-01	1.0019E-01	1.0331E-01	8.106E-02
RA-224	#A	9.4079E-01	9.4079E-01	9.7113E-01	9.7266E-01	1.049E+00
RA-226	#	1.2873E+00	1.2873E+00	1.0229E+00	1.0256E+00	1.096E+00
AC-228		7.5198E-01	7.5198E-01	1.7743E-01	1.8272E-01	
TH-227	#B	-1.8191E-01	-1.8191E-01	3.5653E-01	3.5669E-01	3.921E-01
PA-234	#B	1.7133E-02	1.7133E-02	2.0064E-01	2.0065E-01	2.241E-01
TH-234	#B	1.0630E+00	1.0630E+00	5.8777E+00	5.8780E+00	6.559E+00
AM-241	#A	-5.1366E-02	-5.1367E-02	1.1056E+00	1.1056E+00	1.155E+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 (83.9 to 2000.7 keV) 1.7347267E+01 pCi/gm
Total Decayed Activity (83.9 to 2000.7 keV) 1.7347483E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_13JUL2006_1552.An1

Sample description
FSS-OOL-14-01-001-F

Spectrum Filename: C:\GammaVision\Spectra\107F_13JUL2006_1552.An1

Acquisition information
Start time: 13-Jul-2006 15:52:29
Live time: 2000
Real time: 2002
Dead time: 0.09 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

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

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.5360E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5360E+03) =
6.5104E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

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

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

Corrections	Status	Comments
Decay correct to date:	YES	12-Jul-2006 14:50:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0225

***** 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	243.	21.91	1.50	2.849E-02				
74.97	243.	21.91	1.50	2.849E-02	74.81	9.600	7.802E-01	PB212
76.94	394.	13.07	1.50	2.957E-02	77.11	10.700	1.095E+00	PB214
					77.11	17.500	6.697E-01	PB212
76.94	399.	13.07	1.50	2.957E-02	77.11	10.700	1.095E+00	PB214
					77.11	17.500	6.778E-01	PB212
92.85	135.	30.66	1.50	3.438E-02	88.04	3.790	PBC<MDA	CD109
					92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
92.88	146.	31.48	1.50	3.429E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
128.52	101.	33.78	1.42	3.817E-02				
186.06	200.	22.89	1.30	3.610E-02	185.99	3.280	1.486E+00	RA226
209.68	117.	27.08	1.29	3.425E-02				
238.70	949.	4.01	1.30	3.189E-02	238.63	43.100	5.971E-01	PB212
241.73	215.	13.35	1.30	3.165E-02	241.00	3.900	1.517E+00	RA224
					241.92	7.470	7.966E-01	PB214
270.47	131.	21.54	1.74	2.943E-02				
277.63	100.	30.52	1.76	2.890E-02				
277.63	100.	30.52	1.76	2.890E-02	279.17	81.500	3.758E-02	HG203
295.27	300.	8.47	1.34	2.767E-02	295.22	19.200	4.897E-01	PB214
300.49	58.	31.88	1.34	2.732E-02				
338.46	222.	14.77	1.47	2.500E-02	338.40	12.010	6.404E-01	AC228
351.97	566.	6.54	1.62	2.426E-02				
351.97	566.	6.54	1.62	2.426E-02	351.99	37.100	5.487E-01	PB214
462.77	91.	24.33	1.17	1.955E-02				
462.77	91.	24.33	1.17	1.955E-02	463.51	10.000	3.990E-01	SB125

510.82	156.	17.77	1.50	1.808E-02	510.72	22.500	2.646E-01	TL208
583.13	350.	7.05	1.86	1.629E-02	583.14	86.000	2.168E-01	TL208
609.31	411.	6.43	1.64	1.574E-02	609.32	46.090	4.926E-01	BI214
661.68	128.	15.06	1.86	1.477E-02	661.62	84.620	8.733E-02	CS137
727.89	106.	16.75	0.78	1.373E-02	727.17	11.800	5.670E-01	BI212
794.82	45.	29.32	0.79	1.285E-02				
794.82	45.	29.32	0.79	1.285E-02	795.76	85.400	3.556E-02	CS134
911.23	245.	7.47	2.51	1.161E-02	911.07	29.000	6.298E-01	AC228

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
968.55	221.	12.07	1.86	1.110E-02	968.90	17.460	9.955E-01	AC228
1120.47	196.	14.11	1.76	9.969E-03	1120.28	15.040	1.144E+00	BI214
1460.74	1449.	2.67	2.13	8.191E-03	1460.75	10.700	1.450E+01	K40
1764.57	86.	11.23	1.22	7.083E-03	1764.51	15.920	6.624E-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	
256.69	128.52	470.	112.	0.056	86.55	1.418	AC-228	s
419.00	209.68	368.	117.	0.058	81.24	1.285	NP-239	s
477.03	238.66	249.	949.	0.474	12.03	1.297	PB-212	D
483.09	241.69	306.	215.	0.108	40.05	1.299	PB-214	D
540.56	270.47	258.	131.	0.066	64.62	1.738	AC-228	s
554.88	277.63	292.	105.	0.053	74.65	1.761	NP-239	s
600.60	300.49	190.	52.	0.026	124.06	1.021	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	149.61	74.97	1339.	243.	0.121	65.74	1.500s
PB-214	153.89	77.11	1163.	394.	0.197	39.20	1.500D
PB-212	153.89	77.11	1158.	399.	0.199	39.20	1.500D
TH-234	185.42	92.88	1105.	146.	0.073	94.43	1.500s
TH-234	185.37	92.85	1074.	135.	0.068	91.97	1.500s
RA-226	371.76	186.06	632.	200.	0.100	68.67	1.300s
PB-212	477.00	238.68	680.	896.	0.448	15.58	1.500s
PB-214	590.21	295.29	325.	302.	0.151	30.15	1.500s
AC-228	676.53	338.46	269.	219.	0.109	44.32	1.469s
PB-214	703.52	351.95	205.	485.	0.242	18.26	1.500s
SB-125	925.48	462.94	137.	62.	0.031	85.03	1.500
TL-208	1021.23	510.82	209.	122.	0.061	53.31	1.498s
TL-208	1165.84	583.13	94.	345.	0.173	21.16	1.859s
BI-214	1218.20	609.31	97.	406.	0.203	19.29	1.645s
CS-137	1322.94	661.68	90.	124.	0.062	45.19	1.859
BI-212	1455.35	727.89	68.	105.	0.052	50.26	0.781s
CS-134	1589.57	795.00	69.	40.	0.020	98.21	1.684s
AC-228	1822.03	911.23	42.	241.	0.120	22.42	2.511s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1936.66	968.55	105.	219.	0.110	36.20	1.858s
BI-214	2240.51	1120.47	110.	195.	0.097	42.34	1.764s
K-40	2921.08	1460.74	15.	1444.	0.722	8.00	2.128
BI-214	3528.79	1764.57	3.	85.	0.042	33.69	1.220s

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		1.0409E-01					
			477.56	1.041E-01	%(	2.393E-01 7.22E-02	G
K-40		1.4499E+01					
			1460.75	1.450E+01	(P	2.061E-01 3.88E-01	G
MN-54		-6.7241E-03					
			834.81	-6.724E-03	%(P	3.212E-02 9.39E-03	G
CO-57		6.0964E-03					
			122.07	6.096E-03	%(P	3.458E-02 1.03E-02	G K
			136.43	-1.305E-02	& P	2.788E-01 8.30E-02	G
CO-60		-4.6261E-03					
			1332.51	-4.626E-03	%(P	3.124E-02 8.26E-03	G K
			1173.23	1.530E-02	% P	4.160E-02 1.23E-02	G K
Sr-85		-1.9496E-02					
			514.00	-1.950E-02	&(	3.821E-02 1.16E-02	G
Kr-85		-4.7916E+02					
			513.99	-4.792E+02	&(P	8.774E+02 2.65E+02	G
Y-88		-4.9620E-03					
			1836.01	-4.962E-03	%(P	2.778E-02 7.52E-03	G K
			898.02	-4.593E-03	% P	3.622E-02 1.04E-02	G
NB-94		-3.4973E-03					
			871.10	-3.497E-03	%(P	3.261E-02 9.42E-03	G K
			702.50	1.087E-02	% P	2.940E-02 8.79E-03	G K
Ag-108M		-8.1728E-04					
			722.95	-8.173E-04	%(	6.254E-02 1.84E-02	G K
			614.37	-2.024E-02	%	3.726E-02 1.14E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		433.93	-4.594E-03	% P	2.652E-02	7.72E-03	G
CD-109	1.5228E-01						
		88.04	1.523E-01	%(P	9.794E-01	2.93E-01	G
SN-113	5.9014E-03						
		391.71	5.901E-03	&(P	4.129E-02	1.21E-02	G K
		255.04	3.793E-02	%	1.219E+00	3.59E-01	G
SB-125	6.7395E-02						
		427.95	-3.528E-03	%(P	9.174E-02	2.66E-02	G K
		600.77	1.602E-02	% P	1.328E-01	3.83E-02	G
		636.15	-3.086E-03	& P	2.132E-01	6.02E-02	G
		463.51	2.773E-01	(P	2.580E-01	8.22E-02	G
		176.29	1.006E-01	% P	4.408E-01	1.32E-01	G
I-131	-5.8479E-03						
		364.48	-5.848E-03	&(	3.003E-02	8.87E-03	G K
		636.97	1.169E-01	%	2.824E-01	8.48E-02	G
		284.29	-6.276E-02	%	4.996E-01	1.48E-01	G
CS-134	1.4911E-02						
		604.66	-2.091E-04	%(P	2.655E-02	7.57E-03	G K
		795.76	3.219E-02	(P	3.317E-02	1.07E-02	G
		569.29	0.000E+00	%	1.753E-01	5.04E-02	G
		801.84	-3.790E-02	& P	2.738E-01	7.82E-02	G
CS-137	8.7333E-02						
		661.62	8.733E-02	(P	3.301E-02	1.35E-02	G
CE-139	-1.9466E-03						
		165.85	-1.947E-03	%(P	2.572E-02	7.59E-03	G
EU-152	4.9617E-03						
		121.78	4.962E-03	&(P	1.059E-01	3.16E-02	G K
		344.30	1.485E-02	% P	9.300E-02	2.75E-02	G
		1408.08	4.215E-02	% P	1.177E-01	3.45E-02	G
		964.00	-5.390E-03	& P	3.758E-01	1.10E-01	G
		1112.07	6.306E-02	% P	2.871E-01	8.41E-02	G
		778.90	-6.892E-02	% P	2.555E-01	7.54E-02	G
EU-154	-1.8484E-03						
		123.10	-1.848E-03	%(P	7.710E-02	2.29E-02	G K
		1274.80	-9.159E-04	& P	1.353E-01	3.87E-02	G
		723.30	-6.113E-02	% P	1.928E-01	5.75E-02	G
		1004.80	-4.486E-02	& P	2.221E-01	6.51E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	8.1781E-02						
		86.45	8.178E-02	%(	1.360E-01	4.14E-02	G K
		105.31	2.284E-02	% P	1.413E-01	4.23E-02	G
HG-203	-2.5696E-03						
		279.17	-2.570E-03	&(P	3.474E-02	1.03E-02	G K
		72.87	-8.701E-03	& P	1.114E+00	3.34E-01	G
		70.83	4.339E-01	%	1.485E+00	4.47E-01	G
		82.50	1.342E-02	%	2.135E+00	6.38E-01	G
TL-208	2.1676E-01						
		583.14	2.168E-01	@(P	3.005E-02	1.55E-02	G
		510.72	2.646E-01	+ P	1.514E-01	6.00E-02	G
PB-212	5.7353E-01						
		238.63	5.735E-01	@(P	7.953E-02	3.03E-02	G K
							Energy duplication
		77.11	6.778E-01	+	2.742E-01	8.86E-02	G
		74.81	7.802E-01	& P	5.571E-01	1.74E-01	G
PB-214	4.8272E-01						
		351.99	4.740E-01	*(P	6.781E-02	2.91E-02	G K
		295.22	4.996E-01	@(P	1.436E-01	5.10E-02	G
							Energy duplication
		77.11	1.095E+00	+ P	4.493E-01	1.45E-01	G
		241.92	2.447E-01	% P	5.402E-01	1.64E-01	G
BI-212	5.6701E-01						
		727.17	5.670E-01	@(P	2.239E-01	9.62E-02	G K
		1620.56	2.012E-01	% P	8.062E-01	2.27E-01	G
		785.42	4.859E-01	% P	1.532E+00	4.54E-01	G
BI-214	4.9264E-01						
		609.32	4.926E-01	@(P	5.886E-02	3.20E-02	G K
		1764.51	6.624E-01	+ P	8.511E-02	7.52E-02	G
		1120.28	1.144E+00	+ P	3.028E-01	1.62E-01	G
RA-224	-8.3103E-03						
		241.00	-8.310E-03	%(P	9.316E-01	2.77E-01	G
RA-226	1.4860E+00						
		185.99	1.486E+00	*(	8.905E-01	3.40E-01	G
AC-228	6.3288E-01						
		911.07	6.298E-01	(P	8.604E-02	4.79E-02	G K
		968.90	9.955E-01	+ P	2.291E-01	1.21E-01	G
		338.40	6.404E-01	*(P	2.320E-01	9.60E-02	G

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

TH-227      -2.2773E-01
                          236.00-2.277E-01 %(P 3.644E-01 1.11E-01 G K
                          256.25 7.179E-03 & P 3.721E-01 1.09E-01 G

PA-234       3.5193E-02
                           98.44 3.519E-02 %(  1.357E-01 4.08E-02 G K
                          946.00-1.072E-03 %   1.626E-01 4.62E-02 G
                          131.28-2.467E-02 &   1.559E-01 4.67E-02 G
                           94.67-9.340E-02 %   2.534E-01 7.65E-02 G
                          883.24 9.478E-02 &   2.363E-01 7.09E-02 G
                          926.70-4.242E-02 %   2.957E-01 8.57E-02 G
                          569.26 0.000E+00 %   2.598E-01 7.46E-02 G

TH-234       9.4728E-01
                           63.29 4.510E-01 %(P 1.648E+00 4.94E-01 G K
                           92.80 1.156E+00  (P 1.326E+00 4.06E-01 G
                           92.38 1.457E+00  (P 1.573E+00 4.84E-01 G

AM-241       2.2308E-03
                           59.54 2.231E-03 %(P 1.731E-01 5.13E-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	1.0269E-01	1.0409E-01	2.1675E-01	2.1683E-01	2.361E-01
K-40		1.4499E+01	1.4499E+01	1.1631E+00	1.4443E+00	
MN-54	#A	-6.7086E-03	-6.7241E-03	3.0836E-02	3.0838E-02	3.205E-02
CO-57	#B	6.0801E-03	6.0964E-03	3.1048E-02	3.1050E-02	3.448E-02
CO-60	#B	-4.6243E-03	-4.6261E-03	2.4459E-01	2.4459E-01	3.123E-02
Sr-85	#A	-1.9280E-02	-1.9496E-02	3.4839E-02	3.4858E-02	3.779E-02
Kr-85	#A	-4.7916E+02	-4.7916E+02	9.1697E+02	9.1741E+02	8.774E+02
Y-88	#B	-4.9285E-03	-4.9620E-03	3.4763E-02	3.4764E-02	2.759E-02
NB-94	#B	-3.4973E-03	-3.4973E-03	2.9916E-02	2.9916E-02	3.261E-02
Ag-108M	#B	-8.1727E-04	-8.1728E-04	5.5247E-02	5.5247E-02	6.254E-02
CD-109	#A	1.5203E-01	1.5228E-01	8.7981E-01	8.7985E-01	9.778E-01
SN-113	#B	5.8644E-03	5.9014E-03	3.6434E-02	3.6435E-02	4.103E-02
SB-125	#B	6.7347E-02	6.7395E-02	5.9930E-02	6.0062E-02	9.167E-02
I-131	#B	-5.3448E-03	-5.8479E-03	2.6608E-02	2.6610E-02	2.745E-02
CS-134	#B	1.4897E-02	1.4911E-02	1.4837E-02	1.4863E-02	2.652E-02
CS-137		8.7327E-02	8.7333E-02	4.0594E-02	4.0920E-02	
CE-139	#A	-1.9364E-03	-1.9466E-03	2.5275E-02	2.5275E-02	2.559E-02
EU-152	#B	4.9610E-03	4.9617E-03	9.4674E-02	9.4674E-02	1.059E-01
EU-154	#B	-1.8480E-03	-1.8484E-03	9.6512E-02	9.6512E-02	7.709E-02
EU-155	#B	8.1748E-02	8.1781E-02	1.2425E-01	1.2434E-01	1.359E-01
HG-203	#B	-2.5300E-03	-2.5696E-03	4.5357E-02	4.5358E-02	3.421E-02
TL-208	#	2.1676E-01	2.1676E-01	4.6481E-02	4.8211E-02	
PB-212	#	5.7353E-01	5.7353E-01	9.0896E-02	9.7003E-02	7.953E-02
PB-214	#	4.8272E-01	4.8272E-01	8.6243E-02	9.0833E-02	6.781E-02
BI-212	#	5.6701E-01	5.6701E-01	2.8846E-01	2.9040E-01	
BI-214		4.9264E-01	4.9264E-01	9.6042E-02	1.0035E-01	
RA-224	#A	-8.3103E-03	-8.3103E-03	2.6503E+00	2.6503E+00	9.316E-01
RA-226	#	1.4860E+00	1.4860E+00	1.0205E+00	1.0242E+00	
AC-228	#	6.3288E-01	6.3288E-01	1.4441E-01	1.4917E-01	
TH-227	#B	-2.2773E-01	-2.2773E-01	3.3525E-01	3.3552E-01	3.644E-01
PA-234	#B	3.5193E-02	3.5193E-02	1.2236E-01	1.2238E-01	1.357E-01
TH-234	#B	9.4728E-01	9.4728E-01	9.4336E-01	9.4482E-01	1.648E+00
AM-241	#A	2.2308E-03	2.2308E-03	1.5391E-01	1.5391E-01	1.731E-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) 1.7981541E+01 pCi/gm
Total Decayed Activity (270.2 to 2000.1 keV) 1.7981548E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_13JUL2006_1632.An1

Sample description
FSS-OOL-14-01-004-F

Spectrum Filename: C:\GammaVision\Spectra\107F_13JUL2006_1632.An1

Acquisition information
Start time: 13-Jul-2006 16:32:44
Live time: 2000
Real time: 2003
Dead time: 0.14 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

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

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 2.0460E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0460E+03) =
4.8876E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

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

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

Corrections	Status	Comments
Decay correct to date:	YES	11-Jul-2006 10:48:00
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. 23 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0989

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.65	381.	11.55	1.18	2.842E-02	72.87	6.400	1.475E+00	HG203
					74.81	9.600	9.114E-01	PB212
					77.11	10.700	7.860E-01	PB214
77.17	593.	7.87	1.18	2.961E-02	77.11	17.500	7.574E-01	PB212
93.16	230.	22.14	1.50	3.438E-02	92.38	2.570	1.721E+00	TH234
					92.80	3.000	1.471E+00	TH234
186.07	278.	16.59	0.99	3.610E-02	185.99	3.280	1.553E+00	RA226
209.63	156.	23.57	1.28	3.426E-02				
238.71	1334.	3.51	1.30	3.188E-02	238.63	43.100	6.333E-01	PB212
241.48	235.	18.22	1.30	3.166E-02	241.00	3.900	1.243E+00	RA224
					241.92	7.470	6.524E-01	PB214
295.36	334.	8.39	1.34	2.768E-02	295.22	19.200	4.093E-01	PB214
300.46	73.	29.04	1.34	2.734E-02				
328.22	91.	31.79	1.55	2.559E-02				
338.51	307.	13.20	1.27	2.500E-02	338.40	12.010	6.690E-01	AC228
351.92	550.	7.64	1.55	2.426E-02	351.99	37.100	4.002E-01	PB214
463.00	102.	22.88	1.57	1.954E-02				
463.00	102.	22.88	1.57	1.954E-02	463.51	10.000	3.353E-01	SB125
510.86	254.	13.50	1.43	1.808E-02	510.72	22.500	3.571E-01	TL208
583.32	472.	6.07	1.79	1.629E-02	583.14	86.000	2.203E-01	TL208
609.46	496.	6.82	1.75	1.574E-02	609.32	46.090	4.472E-01	BI214
661.73	230.	14.85	1.76	1.477E-02	661.62	84.620	1.198E-01	CS137
727.14	148.	15.16	1.34	1.374E-02	727.17	11.800	5.996E-01	BI212
785.41	59.	30.18	0.91	1.297E-02	785.42	2.000	1.493E+00	BI212
794.94	82.	21.87	1.62	1.285E-02				
794.94	82.	21.87	1.62	1.285E-02	795.76	85.400	4.942E-02	CS134
911.22	290.	7.32	2.02	1.161E-02	911.07	29.000	5.617E-01	AC228

968.38	229.	11.59	1.74	1.110E-02	968.90	17.460	7.747E-01	AC228
1066.06	38.	37.49	1.31	1.034E-02				
1120.11	96.	17.53	1.80	9.971E-03	1120.28	15.040	4.190E-01	BI214
1332.78	29.	35.78	2.03	8.773E-03	1332.51	99.980	PBC<MDA	CO60
1460.85	1853.	2.38	2.20	8.191E-03	1460.75	10.700	1.393E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1764.57	113.	9.80	1.76	7.083E-03	1764.51	15.920	6.583E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.89	209.63	517.	156.	0.078	70.72	1.284	NP-239	
600.13	300.25	291.	75.	0.037	111.56	0.960	PB-212	sM
656.06	328.22	290.	91.	0.046	95.38	1.547	AC-228	s
2131.69	1066.06	66.	38.	0.019	112.48	1.307	BI-207	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
HG-203	145.47	72.90	1801.	-153.	-0.076	120.38	1.500
PB-212	149.29	74.81	784.	376.	0.188	34.75	1.178D
PB-214	153.89	77.11	1227.	192.	0.096	3.65	1.500A
PB-212	153.89	77.11	794.	496.	0.248	22.27	1.179A
TH-234	185.98	93.16	1419.	230.	0.115	66.42	1.500s
RA-226	371.78	186.07	714.	278.	0.139	49.78	0.994s
TH-227	472.28	236.32	1491.	-166.	-0.083	101.71	1.500s
PB-212	476.89	238.63	361.	1318.	0.659	10.12	1.297D
RA-224	482.44	241.40	1014.	133.	0.067	102.75	1.500
PB-214	483.47	241.92	508.	196.	0.098	52.93	1.299D
PB-214	589.95	295.16	509.	433.	0.217	31.77	1.447s
AC-228	676.63	338.51	397.	304.	0.152	39.59	1.268
PB-214	703.45	351.92	363.	545.	0.273	22.91	1.549s
SB-125	926.20	463.30	176.	73.	0.037	80.87	1.500s
TL-208	1021.31	510.86	282.	220.	0.110	40.51	1.425s
TL-208	1166.22	583.32	129.	467.	0.234	18.20	1.793s
BI-214	1218.51	609.46	184.	491.	0.246	20.45	1.748
CS-137	1323.03	661.73	203.	227.	0.113	44.56	1.760
BI-212	1453.86	727.14	117.	147.	0.074	45.47	1.340s
BI-212	1570.38	785.41	87.	59.	0.029	90.54	0.908s
CS-134	1589.38	794.91	71.	62.	0.031	68.14	1.684s
AC-228	1822.00	911.22	69.	286.	0.143	21.95	2.023s
AC-228	1936.33	968.38	135.	227.	0.114	34.77	1.743

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	2239.78	1120.11	73.	95.	0.048	52.59	1.803
CO-60	2665.15	1332.78	56.	29.	0.014	107.33	2.031s
K-40	2921.30	1460.85	26.	1848.	0.924	7.13	2.203
BI-214	3528.80	1764.57	4.	112.	0.056	29.40	1.756

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		8.6158E-03					
			477.56	8.616E-03	%(	2.087E-01 6.07E-02 G	
K-40		1.3929E+01					
			1460.75	1.393E+01	(P	1.986E-01 3.32E-01 G	
MN-54		-1.3816E-03					
			834.81	-1.382E-03	%(P	2.816E-02 8.13E-03 G	
CO-57		-1.3510E-03					
			122.07	-1.351E-03	&(P	3.174E-02 9.48E-03 G K	
			136.43	1.359E-02	% P	2.495E-01 7.45E-02 G	
CO-60		2.1846E-02					
			1332.51	2.185E-02	@(P	2.833E-02 8.83E-03 G K	
			1173.23	4.331E-03	% P	4.121E-02 1.20E-02 G K	
Sr-85		-2.1314E-02					
			514.00	-2.131E-02	%(	3.391E-02 1.04E-02 G	
Kr-85		-5.0598E+02					
			513.99	-5.060E+02	%(P	7.676E+02 2.34E+02 G	
Y-88		-2.5940E-03					
			1836.01	-2.594E-03	%(P	1.777E-02 4.61E-03 G K	
			898.02	6.026E-03	% P	2.439E-02 7.12E-03 G	
NB-94		8.6193E-03					
			871.10	8.619E-03	%(P	2.032E-02 6.11E-03 G K	
			702.50	2.619E-03	& P	2.657E-02 7.75E-03 G K	
Ag-108M		-1.2885E-02					
			722.95	-1.289E-02	%(	3.678E-02 1.10E-02 G K	
			614.37	-2.178E-03	&	2.879E-02 8.41E-03 G	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		433.93	3.591E-03	& P	2.587E-02	7.63E-03	G
CD-109	5.9664E-01						
		88.04	5.966E-01	%(P	9.619E-01	2.93E-01	G
SN-113	-6.5159E-03						
		391.71	-6.516E-03	&(P	3.667E-02	1.08E-02	G K
		255.04	-1.892E-01	&	1.140E+00	3.40E-01	G
SB-125	7.6705E-02						
		427.95	1.855E-02	&(P	6.948E-02	2.07E-02	G K
		600.77	-6.372E-03	& P	1.011E-01	2.87E-02	G
		636.15	-4.505E-02	% P	2.183E-01	6.42E-02	G
		463.51	2.489E-01	*(P	2.186E-01	6.96E-02	G
		176.29	-1.019E-01	% P	3.910E-01	1.17E-01	G
I-131	-6.3547E-03						
		364.48	-6.355E-03	&(	3.439E-02	1.02E-02	G K
		636.97	-1.015E-01	&	4.150E-01	1.23E-01	G
		284.29	1.776E-01	&	4.384E-01	1.32E-01	G
CS-134	1.6212E-02						
		604.66	-2.586E-03	%(P	6.063E-02	1.81E-02	G K
		795.76	3.770E-02	*(P	2.540E-02	8.63E-03	G
		569.29	7.102E-02	%	1.441E-01	4.38E-02	G
		801.84	1.692E-03	& P	2.899E-01	8.31E-02	G
CS-137	1.1979E-01						
		661.62	1.198E-01	(P	3.655E-02	1.81E-02	G
CE-139	1.3848E-02						
		165.85	1.385E-02	%(P	3.244E-02	9.82E-03	G
EU-152	-1.1860E-03						
		121.78	-1.186E-03	&(P	8.905E-02	2.65E-02	G K
		344.30	-4.979E-03	% P	7.833E-02	2.30E-02	G
		1408.08	7.598E-02	% P	1.058E-01	3.34E-02	G
		964.00	-5.383E-02	% P	2.879E-01	8.53E-02	G
		1112.07	9.406E-02	% P	2.269E-01	6.82E-02	G
		778.90	-4.580E-02	% P	2.105E-01	6.19E-02	G
EU-154	-1.4782E-02						
		123.10	-1.478E-02	%(P	7.007E-02	2.11E-02	G K
		1274.80	-1.270E-02	% P	9.072E-02	2.63E-02	G
		723.30	-6.258E-02	% P	1.680E-01	5.04E-02	G
		1004.80	-7.094E-04	& P	2.102E-01	6.09E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	6.8198E-02						
		86.45	6.820E-02	&(	1.191E-01	3.62E-02	G K
		105.31	2.974E-02	% P	1.368E-01	4.11E-02	G
HG-203	-6.4652E-04						
		279.17	-6.465E-04	&(P	2.133E-02	6.22E-03	G K
		72.87	-7.292E-02	% P	8.651E-01	2.60E-01	G
		70.83	-1.129E+00	+	1.482E+00	4.53E-01	G
		82.50	-4.103E-02	&	1.881E+00	5.63E-01	G
TL-208	2.2029E-01						
		583.14	2.203E-01	*(P	2.621E-02	1.35E-02	G
		510.72	3.571E-01	+ P	1.315E-01	5.56E-02	G
PB-212	6.3349E-01						
		238.63	6.335E-01	(P	4.381E-02	2.16E-02	G K
							Energy duplication
		77.11	6.335E-01	}	1.710E-01	4.70E-02	G
		74.81	9.087E-01	+ P	3.215E-01	1.06E-01	G
PB-214	4.0018E-01						
		351.99	4.002E-01	@(P	6.712E-02	3.08E-02	G K
		295.22	5.388E-01	+ P	1.340E-01	5.76E-02	G
							Energy duplication
		77.11	4.002E-01	} P	3.463E-01	4.87E-03	G
		241.92	5.472E-01	+ P	3.012E-01	9.73E-02	G
BI-212	5.9959E-01						
		727.17	5.996E-01	*(P	2.161E-01	9.17E-02	G K
		1620.56	4.059E-02	% P	7.525E-01	2.04E-01	G
		785.42	1.493E+00	+ P	1.178E+00	4.60E-01	G
BI-214	4.4027E-01						
		609.32	4.472E-01	(P	5.997E-02	3.08E-02	G K
		1764.51	6.583E-01	+ P	6.763E-02	6.50E-02	G
		1120.28	4.190E-01	(P	1.872E-01	7.41E-02	G
RA-224	7.1286E-01						
		241.00	7.129E-01	?(P	8.072E-01	2.48E-01	G
RA-226	1.5529E+00						
		185.99	1.553E+00	*(	7.095E-01	2.58E-01	G
AC-228	5.9311E-01						
		911.07	5.617E-01	(P	8.112E-02	4.17E-02	G K
		968.90	7.747E-01	+ P	1.938E-01	9.06E-02	G
		338.40	6.690E-01	(P	2.101E-01	8.92E-02	G

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

TH-227      -3.0442E-01
                          236.00-3.044E-01 ?(P 3.355E-01 1.03E-01 G K
                          256.25-7.048E-03 % P 3.588E-01 1.06E-01 G

PA-234      -4.2855E-03
                           98.44-4.285E-03 %(  1.189E-01 3.55E-02 G K
                          946.00-1.759E-03 &   1.313E-01 3.75E-02 G
                          131.28-2.306E-02 %   1.413E-01 4.24E-02 G
                           94.67-8.741E-02 %   2.179E-01 6.60E-02 G
                          883.24-2.556E-02 &   2.068E-01 5.99E-02 G
                          926.70 3.647E-02 %   2.430E-01 7.08E-02 G
                          569.26 1.055E-01 %   2.133E-01 6.48E-02 G

TH-234       9.2406E-01
                           63.29 5.037E-01 %(P 1.408E+00 4.24E-01 G K
                           92.80 1.471E+00  (P 1.142E+00 3.54E-01 G
                           92.38-9.166E-02 & P 1.383E+00 4.13E-01 G

AM-241      -2.7727E-02
                           59.54-2.773E-02 &(P 1.792E-01 5.37E-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	8.3689E-03	8.6158E-03	1.8220E-01	1.8220E-01	2.027E-01
K-40		1.3929E+01	1.3929E+01	9.9502E-01	1.2910E+00	
MN-54	#A	-1.3748E-03	-1.3816E-03	3.4115E-02	3.4116E-02	2.802E-02
CO-57	#B	-1.3432E-03	-1.3510E-03	3.0910E-02	3.0910E-02	3.156E-02
CO-60	#B	2.1828E-02	2.1846E-02	2.6490E-02	2.6522E-02	2.831E-02
Sr-85	#A	-2.0810E-02	-2.1314E-02	3.1132E-02	3.1158E-02	3.311E-02
Kr-85	#A	-5.0597E+02	-5.0598E+02	7.7635E+02	7.7692E+02	7.676E+02
Y-88	#B	-2.5565E-03	-2.5940E-03	2.6131E-02	2.6131E-02	1.752E-02
NB-94	#B	8.6193E-03	8.6193E-03	1.8331E-02	1.8338E-02	2.032E-02
Ag-108M	#B	-1.2885E-02	-1.2885E-02	3.3122E-02	3.3131E-02	3.678E-02
CD-109	#A	5.9460E-01	5.9664E-01	8.7894E-01	8.7956E-01	9.586E-01
SN-113	#B	-6.4287E-03	-6.5159E-03	4.2209E-02	4.2211E-02	3.618E-02
SB-125	#F	7.6588E-02	7.6705E-02	6.4405E-02	6.4564E-02	6.938E-02
I-131	#B	-5.2390E-03	-6.3547E-03	3.0671E-02	3.0673E-02	2.835E-02
CS-134	#B	1.6179E-02	1.6212E-02	1.1141E-02	1.1182E-02	6.051E-02
CS-137		1.1977E-01	1.1979E-01	5.4214E-02	5.4674E-02	
CE-139	#A	1.3692E-02	1.3848E-02	2.9461E-02	2.9472E-02	3.208E-02
EU-152	#B	-1.1856E-03	-1.1860E-03	9.1517E-02	9.1517E-02	8.902E-02
EU-154	#B	-1.4774E-02	-1.4782E-02	6.5180E-02	6.5186E-02	7.003E-02
EU-155	#B	6.8139E-02	6.8198E-02	1.0865E-01	1.0872E-01	1.190E-01
HG-203	#B	-6.2533E-04	-6.4652E-04	7.0826E-02	7.0826E-02	2.063E-02
TL-208	#	2.2029E-01	2.2029E-01	4.0491E-02	4.2530E-02	
PB-212		6.3349E-01	6.3349E-01	6.4844E-02	7.4864E-02	
PB-214		4.0018E-01	4.0018E-01	9.2528E-02	9.5499E-02	
BI-212	#	5.9959E-01	5.9959E-01	2.7500E-01	2.7727E-01	
BI-214		4.4027E-01	4.4027E-01	9.0833E-02	9.4481E-02	
RA-224	#A	7.1286E-01	7.1286E-01	7.4472E-01	7.4590E-01	8.072E-01
RA-226	#	1.5529E+00	1.5529E+00	7.7296E-01	7.7838E-01	
AC-228		5.9311E-01	5.9311E-01	1.3211E-01	1.3668E-01	
TH-227	#A	-3.0442E-01	-3.0442E-01	3.1012E-01	3.1065E-01	3.355E-01
PA-234	#B	-4.2855E-03	-4.2855E-03	1.0655E-01	1.0655E-01	1.189E-01
TH-234	#B	9.2406E-01	9.2406E-01	6.6648E-01	6.6844E-01	1.408E+00
AM-241	#A	-2.7727E-02	-2.7727E-02	1.6978E-01	1.6979E-01	1.792E-01

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

H - Halflife limit exceeded

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

Total Activity (295.2 to 2000.1 keV) 1.8488230E+01 pCi/gm
Total Decayed Activity (295.2 to 2000.1 keV) 1.8488251E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

Sample description
FSS-OOL-14-01-004-F-RC

Spectrum Filename: C:\GammaVision\Spectra\107F_13JUL2006_1710.An1

Acquisition information

Start time:	13-Jul-2006 17:10:18
Live time:	2000
Real time:	2003
Dead time:	0.14 %
Detector ID:	2

Detector system
Det 107- DSPE- 634

Calibration

Filename:	D7_1LSa.Clb

Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration

Created:	29-Oct-2004 06:48:53
Zero offset:	0.157 keV
Gain:	0.500 keV/channel
Quadratic:	-1.676E-08 keV/channel^2

Efficiency Calibration

Created:	29-Oct-2004 06:51:32
Type:	Polynomial
Uncertainty:	1.174 %
Coefficients:	-0.279532 -4.778179 0.614896
	-0.087174 0.005356 -0.000131

Library Files

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

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.16keV)
Stop channel:	4000 (2000.15keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	2.0460E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 2.0460E+03) = 4.8876E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

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

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

Corrections	Status	Comments
Decay correct to date:	YES	11-Jul-2006 10:48:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 21 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0722

***** 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	355.	12.21	1.18	2.849E-02	74.81	9.600	8.560E-01	PB212
77.05	481.	7.36	1.18	2.957E-02	77.11	10.700	1.012E+00	PB214
					77.11	17.500	6.250E-01	PB212
87.28	196.	19.49	1.19	3.303E-02	86.45	32.740	1.202E-01	EU155
					88.04	3.790	1.026E+00	CD109
89.85	164.	24.03	1.19	3.369E-02				
89.85	164.	24.03	1.19	3.369E-02	92.38	2.570	PBC<MDA	TH234
93.18	190.	19.83	1.19	3.444E-02	92.80	3.000	PBC<MDA	TH234
185.54	297.	18.56	1.84	3.613E-02	185.99	3.280	1.657E+00	RA226
209.32	157.	26.99	1.12	3.428E-02				
238.70	1290.	3.66	1.30	3.188E-02	238.63	43.100	6.123E-01	PB212
241.95	172.	20.18	1.30	3.162E-02	241.00	3.900	9.072E-01	RA224
					241.92	7.470	4.770E-01	PB214
270.04	118.	35.09	0.99	2.946E-02				
295.29	331.	10.85	1.76	2.767E-02	295.22	19.200	4.063E-01	PB214
328.04	89.	28.16	1.03	2.560E-02				
338.57	338.	11.74	1.34	2.499E-02	338.40	12.010	7.366E-01	AC228
351.85	601.	5.83	1.71	2.427E-02	351.99	37.100	4.372E-01	PB214
463.03	86.	27.88	1.84	1.954E-02				
463.03	86.	27.88	1.84	1.954E-02	463.51	10.000	2.811E-01	SB125
510.70	188.	15.07	1.60	1.808E-02	510.72	22.500	2.514E-01	TL208
583.37	491.	6.13	1.75	1.628E-02	583.14	86.000	2.293E-01	TL208
609.48	456.	7.00	1.80	1.574E-02	609.32	46.090	4.115E-01	BI214
661.81	158.	10.46	1.59	1.477E-02	661.62	84.620	8.151E-02	CS137
666.47	32.	40.71	1.60	1.469E-02				
726.54	150.	20.27	1.84	1.375E-02	727.17	11.800	6.077E-01	BI212
769.48	80.	28.92	0.75	1.317E-02				

794.21	86.	29.22	1.64	1.286E-02				
794.21	86.	29.22	1.64	1.286E-02	795.76	85.400	5.147E-02	CS134
860.35	106.	20.54	2.07	1.211E-02				
911.28	398.	7.98	1.99	1.161E-02	911.07	29.000	7.716E-01	AC228
964.21	65.	20.77	1.80	1.113E-02				
969.01	198.	9.12	1.80	1.109E-02	968.90	17.460	6.677E-01	AC228
1120.39	131.	18.81	1.99	9.969E-03	1120.28	15.040	5.749E-01	BI214
1173.89	39.	40.55	1.93	9.637E-03	1173.23	99.860	PBC<MDA	CO60
1460.85	1864.	2.37	2.10	8.191E-03	1460.75	10.700	1.401E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1764.47	89.	10.60	2.20	7.084E-03	1764.51	15.920	5.160E-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	
174.22	87.17	628.	196.	0.098	58.48	1.187	BI-207	D
179.36	89.74	696.	164.	0.082	72.08	1.189	PB-214	D
186.03	93.07	615.	190.	0.095	59.49	1.191	TH-234	D
418.27	209.32	634.	157.	0.079	80.97	1.119	AC-228	s
539.71	270.04	532.	118.	0.059	105.26	0.993	AC-228	
655.69	328.04	237.	89.	0.045	84.47	1.028	AC-228	s
1332.59	666.32	70.	32.	0.016	124.93	1.597	SB-126	D
1538.54	769.48	138.	80.	0.040	70.75	0.748	BI-214	s
1720.27	860.35	101.	106.	0.053	61.63	2.070	TL-208	s
1928.20	964.22	55.	68.	0.034	58.79	1.796	EU-152	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	145.47	72.90	2491.	-179.	-0.090	121.34	1.500s
PB-212	149.29	74.81	781.	355.	0.177	36.62	1.178D
PB-212	153.89	77.11	852.	481.	0.241	22.07	1.179A
TH-234	186.04	93.19	1523.	141.	0.070	105.17	1.500
RA-226	370.71	185.54	914.	297.	0.148	55.68	1.839s
PB-212	476.89	238.63	407.	1274.	0.637	10.59	1.297D
PB-214	483.47	241.92	521.	168.	0.084	61.55	1.299D
PB-214	590.21	295.29	374.	327.	0.163	32.54	1.756s
AC-228	676.75	338.57	378.	335.	0.167	35.22	1.335s
PB-214	703.31	351.85	236.	596.	0.298	17.48	1.713s
SB-125	926.45	463.43	195.	67.	0.034	91.12	1.500s
TL-208	1020.99	510.70	233.	155.	0.077	45.21	1.602s
TL-208	1166.32	583.37	143.	486.	0.243	18.38	1.748s
BI-214	1218.54	609.48	170.	452.	0.226	20.99	1.797
Ag-108M	1224.66	612.54	230.	-56.	-0.028	122.51	1.561s
CS-137	1322.82	661.62	61.	154.	0.077	31.37	1.594D
BI-212	1452.65	726.54	183.	149.	0.075	60.82	1.836s
CS-134	1588.69	794.56	78.	51.	0.026	82.99	1.684

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1822.13	911.28	134.	393.	0.197	23.94	1.988
AC-228	1937.36	968.90	74.	196.	0.098	28.00	1.799D
BI-214	2240.34	1120.39	130.	131.	0.065	56.43	1.994s
K-40	2921.30	1460.85	28.	1859.	0.930	7.12	2.099
BI-214	3528.59	1764.47	1.	88.	0.044	31.80	2.200

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

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

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		5.4892E-02					
			477.56	5.489E-02	%(	1.977E-01 5.88E-02 G	
K-40		1.4010E+01					
			1460.75	1.401E+01	(P	2.060E-01 3.33E-01 G	
MN-54		-6.4756E-03					
			834.81	-6.476E-03	%(P	2.496E-02 7.35E-03 G	
CO-57		4.9380E-04					
			122.07	4.938E-04	%(P	3.346E-02 9.99E-03 G K	
			136.43	-4.381E-02	% P	2.505E-01 7.52E-02 G	
CO-60		1.6273E-02					
			1332.51	1.627E-02	%(P	3.221E-02 9.69E-03 G K	
			1173.23	2.685E-02	% P	3.923E-02 1.20E-02 G K	
Sr-85		-1.2237E-02					
			514.00	-1.224E-02	&(	3.092E-02 9.32E-03 G	
Kr-85		-3.0124E+02					
			513.99	-3.012E+02	&(P	7.001E+02 2.10E+02 G	
Y-88		-1.1057E-03					
			1836.01	-1.106E-03	%(P	1.985E-02 5.09E-03 G K	
			898.02	2.554E-05	% P	2.939E-02 8.39E-03 G	
NB-94		5.1330E-03					
			871.10	5.133E-03	%(P	2.479E-02 7.27E-03 G K	
			702.50	-2.497E-04	& P	2.819E-02 8.15E-03 G K	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-1.1947E-02						
		722.95	-1.195E-02	%(	4.003E-02	1.20E-02	G K
		614.37	-2.600E-02	+	3.431E-02	1.06E-02	G
		433.93	5.878E-03	% P	2.292E-02	6.80E-03	G
CD-109	6.7829E-01						
		88.04	6.783E-01	%(P	9.626E-01	2.94E-01	G
SN-113	-9.8480E-04						
		391.71	-9.848E-04	&(P	3.507E-02	1.02E-02	G K
		255.04	-2.706E-02	&	1.144E+00	3.39E-01	G
SB-125	6.2231E-02						
		427.95	6.093E-03	%(P	7.199E-02	2.11E-02	G K
		600.77	2.268E-02	% P	1.183E-01	3.47E-02	G
		636.15	-2.351E-02	& P	1.937E-01	5.62E-02	G
		463.51	2.284E-01	*(P	2.298E-01	7.23E-02	G
		176.29	-1.188E-02	& P	3.167E-01	9.37E-02	G
I-131	3.6146E-04						
		364.48	3.615E-04	&(	3.375E-02	9.91E-03	G K
		636.97	-5.061E-03	&	3.332E-01	9.54E-02	G
		284.29	6.706E-02	%	4.344E-01	1.29E-01	G
CS-134	-1.8142E-02						
		604.66	-1.814E-02	%(P	3.128E-02	9.54E-03	G K
		795.76	3.103E-02	+ P	2.644E-02	8.67E-03	G
		569.29	-3.993E-02	%	1.699E-01	5.05E-02	G
		801.84	-6.663E-02	% P	2.981E-01	8.77E-02	G
CS-137	8.1511E-02						
		661.62	8.151E-02	(P	2.063E-02	8.72E-03	G
CE-139	5.2399E-03						
		165.85	5.240E-03	%(P	3.190E-02	9.56E-03	G
EU-152	-1.2344E-02						
		121.78	-1.234E-02	&(P	9.222E-02	2.76E-02	G K
		344.30	-8.195E-04	% P	7.397E-02	2.16E-02	G
		1408.08	6.812E-02	% P	1.005E-01	3.16E-02	G
		964.00	-1.173E-03	& P	2.235E-01	6.45E-02	G
		1112.07	-4.756E-02	& P	2.581E-01	7.56E-02	G
		778.90	4.317E-02	% P	1.807E-01	5.32E-02	G
EU-154	7.0934E-03						
		123.10	7.093E-03	%(P	6.509E-02	1.95E-02	G K
		1274.80	1.418E-02	% P	1.027E-01	2.99E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	-5.275E-02	% P	1.805E-01	5.39E-02	G
		1004.80	-4.251E-03	& P	1.816E-01	5.23E-02	G
EU-155	7.5299E-02						
		86.45	7.530E-02	&(	1.146E-01	3.50E-02	G K
		105.31	2.106E-02	% P	1.359E-01	4.08E-02	G
HG-203	-6.8686E-04						
		279.17	-6.869E-04	%(P	2.767E-02	8.15E-03	G K
		72.87	-6.966E-01	& P	9.143E-01	2.79E-01	G
		70.83	-7.776E-02	&	1.187E+00	3.55E-01	G
		82.50	-5.198E-01	&	1.787E+00	5.39E-01	G
TL-208	2.3392E-01						
		583.14	2.293E-01	(P	2.751E-02	1.42E-02	G
		510.72	2.514E-01	@(P	1.199E-01	4.61E-02	G
PB-212	6.1592E-01						
		238.63	6.123E-01	(P	4.646E-02	2.19E-02	G K
							Energy duplication
		77.11	6.140E-01	}	1.771E-01	4.52E-02	G
		74.81	8.560E-01	+ P	3.211E-01	1.06E-01	G
PB-214	4.3167E-01						
		351.99	4.372E-01	*(P	5.456E-02	2.57E-02	G K
		295.22	4.063E-01	(P	1.154E-01	4.47E-02	G
							Energy duplication
		77.11	2.960E-03	} P	3.820E-01	1.08E-01	G
		241.92	4.696E-01	(P	3.049E-01	9.72E-02	G
BI-212	6.0773E-01						
		727.17	6.077E-01	*(P	2.676E-01	1.24E-01	G K
		1620.56	3.897E-01	% P	5.908E-01	1.88E-01	G
		785.42	4.111E-01	& P	1.296E+00	3.85E-01	G
BI-214	4.1153E-01						
		609.32	4.115E-01	(P	5.777E-02	2.91E-02	G K
		1764.51	5.160E-01	+ P	4.317E-02	5.53E-02	G
		1120.28	5.749E-01	+ P	2.464E-01	1.09E-01	G
RA-224	1.5505E-01						
		241.00	1.550E-01	%(P	8.915E-01	2.68E-01	G
RA-226	1.6566E+00						
		185.99	1.657E+00	*(	8.009E-01	3.07E-01	G
AC-228	7.3348E-01						
		911.07	7.716E-01	(P	1.111E-01	6.22E-02	G K
		968.90	6.680E-01	(P	1.461E-01	6.31E-02	G
		338.40	7.366E-01	*(P	2.053E-01	8.73E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	4.0303E-02						
		236.00	4.030E-02	%(P	3.010E-01	9.02E-02	G K
		256.25	1.013E-01	% P	3.333E-01	1.00E-01	G
PA-234	-7.9002E-04						
		98.44	-7.900E-04	%(	1.297E-01	3.88E-02	G K
		946.00	4.810E-02	&	1.142E-01	3.44E-02	G
		131.28	-9.195E-04	%	1.374E-01	4.10E-02	G
		94.67	-8.746E-02	%	2.229E-01	6.74E-02	G
		883.24	-3.876E-03	%	2.058E-01	5.88E-02	G
		926.70	5.911E-02	&	2.153E-01	6.35E-02	G
		569.26	-5.903E-02	%	2.515E-01	7.47E-02	G
TH-234	8.6367E-01						
		63.29	8.345E-01	%(P	1.465E+00	4.45E-01	G K
		92.80	9.015E-01	(P	1.182E+00	3.60E-01	G
		92.38	5.848E-02	% P	1.199E+00	3.58E-01	G
AM-241	-6.3163E-03						
		59.54	-6.316E-03	&(P	1.758E-01	5.25E-02	G

(- This peak used in the nuclide activity average.

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

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

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

- -

***** 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	5.3301E-02	5.4892E-02	1.7639E-01	1.7642E-01	1.920E-01
K-40		1.4010E+01	1.4010E+01	9.9944E-01	1.2975E+00	
MN-54	#A	-6.4431E-03	-6.4756E-03	2.3664E-02	2.3667E-02	2.483E-02
CO-57	#B	4.9094E-04	4.9380E-04	2.9975E-02	2.9975E-02	3.327E-02
CO-60	#B	1.6260E-02	1.6273E-02	2.9077E-02	2.9092E-02	3.218E-02
Sr-85	#A	-1.1945E-02	-1.2237E-02	2.7968E-02	2.7977E-02	3.018E-02
Kr-85	#A	-3.0123E+02	-3.0124E+02	7.4699E+02	7.4720E+02	7.001E+02
Y-88	#B	-1.0895E-03	-1.1057E-03	9.5013E-02	9.5013E-02	1.956E-02
NB-94	#B	5.1330E-03	5.1330E-03	2.1797E-02	2.1800E-02	2.479E-02
Ag-108M	#B	-1.1947E-02	-1.1947E-02	3.5941E-02	3.5948E-02	4.003E-02
CD-109	#A	6.7594E-01	6.7829E-01	8.8180E-01	8.8260E-01	9.593E-01
SN-113	#B	-9.7146E-04	-9.8480E-04	4.1057E-01	4.1057E-01	3.460E-02
SB-125	#B	6.2135E-02	6.2231E-02	5.9072E-02	5.9186E-02	7.188E-02
I-131	#B	2.9733E-04	3.6146E-04	2.9721E-02	2.9721E-02	2.777E-02
CS-134	#B	-1.8104E-02	-1.8142E-02	2.9340E-02	2.9359E-02	3.121E-02
CS-137		8.1499E-02	8.1511E-02	2.6160E-02	2.6599E-02	
CE-139	#A	5.1804E-03	5.2399E-03	2.8675E-02	2.8676E-02	3.154E-02
EU-152	#B	-1.2340E-02	-1.2344E-02	8.3999E-02	8.4001E-02	9.219E-02
EU-154	#B	7.0898E-03	7.0934E-03	5.8427E-02	5.8428E-02	6.506E-02
EU-155	#B	7.5233E-02	7.5299E-02	1.0485E-01	1.0493E-01	1.145E-01
HG-203	#B	-6.6410E-04	-6.8686E-04	8.3948E-02	8.3948E-02	2.676E-02
TL-208	#	2.3392E-01	2.3392E-01	4.3397E-02	4.5543E-02	
PB-212		6.1592E-01	6.1592E-01	6.6005E-02	7.5365E-02	
PB-214		4.3167E-01	4.3167E-01	7.6090E-02	8.0247E-02	
BI-212	#	6.0773E-01	6.0773E-01	3.7281E-01	3.7454E-01	
BI-214		4.1153E-01	4.1153E-01	8.7197E-02	9.0521E-02	
RA-224	#A	1.5505E-01	1.5505E-01	8.0278E-01	8.0283E-01	8.915E-01
RA-226	#	1.6566E+00	1.6566E+00	9.2246E-01	9.2764E-01	
AC-228		7.3348E-01	7.3348E-01	1.2590E-01	1.3314E-01	
TH-227	#B	4.0303E-02	4.0303E-02	2.7074E-01	2.7075E-01	3.010E-01
PA-234	#B	-7.9002E-04	-7.9002E-04	1.1625E-01	1.1625E-01	1.297E-01
TH-234	#B	8.6367E-01	8.6367E-01	8.6276E-01	8.6409E-01	1.465E+00
AM-241	#A	-6.3163E-03	-6.3163E-03	1.9816E-01	1.9816E-01	1.758E-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) 1.8782417E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 1.8782434E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_13JUL2006_1749.An1

Sample description
FSS-OOL-14-01-018-F-B

Spectrum Filename: C:\GammaVision\Spectra\107F_13JUL2006_1749.An1

Acquisition information
Start time: 13-Jul-2006 17:49:36
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: 1.8930E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8930E+03) =
5.2826E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

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

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

Corrections	Status	Comments
Decay correct to date:	YES	11-Jul-2006 10:58:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 18 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1626

***** 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	238.	23.98	1.50	2.849E-02				
74.92	238.	23.98	1.50	2.849E-02	74.81	9.600	6.221E-01	PB212
77.05	444.	12.79	1.50	2.957E-02	77.11	17.500	6.118E-01	PB212
					77.11	10.700	9.898E-01	PB214
77.05	439.	12.79	1.50	2.957E-02	77.11	17.500	6.052E-01	PB212
					77.11	10.700	9.898E-01	PB214
87.79	139.	25.72	1.19	3.328E-02	86.45	32.740	9.221E-02	EU155
89.87	117.	28.36	1.19	3.379E-02				
92.92	195.	17.43	1.19	3.447E-02	92.38	2.570	1.514E+00	TH234
					92.80	3.000	1.212E+00	TH234
129.68	98.	39.53	1.50	3.823E-02	131.28	20.000	PBC<MDA	PA234
186.30	158.	25.18	1.20	3.608E-02	185.99	3.280	9.525E-01	RA226
209.58	128.	31.06	1.54	3.426E-02				
238.71	1135.	3.75	1.30	3.188E-02	238.63	43.100	5.813E-01	PB212
241.38	175.	22.23	1.30	3.166E-02	241.00	3.900	9.947E-01	RA224
270.37	130.	20.41	1.91	2.943E-02				
295.25	213.	10.78	1.34	2.768E-02				
295.25	213.	10.78	1.34	2.768E-02	295.22	19.200	2.804E-01	PB214
300.58	59.	33.47	1.34	2.733E-02				
328.42	86.	26.72	1.77	2.558E-02				
338.53	281.	13.58	1.61	2.500E-02	338.40	12.010	6.613E-01	AC228
351.96	418.	7.84	1.59	2.426E-02				
351.96	418.	7.84	1.59	2.426E-02	351.99	37.100	3.274E-01	PB214
463.23	125.	23.81	1.40	1.954E-02				
463.23	125.	23.81	1.40	1.954E-02	463.51	10.000	4.489E-01	SB125
510.99	171.	16.08	1.73	1.807E-02	510.72	22.500	2.408E-01	TL208
583.35	426.	7.53	1.88	1.629E-02	583.14	86.000	2.150E-01	TL208

609.33	312.	7.89	1.71	1.574E-02	609.32	46.090	3.027E-01	BI214
661.54	157.	20.35	1.73	1.477E-02	661.62	84.620	8.755E-02	CS137
727.77	90.	22.85	1.66	1.373E-02	727.17	11.800	3.901E-01	BI212
768.67	90.	24.80	1.01	1.318E-02				
795.15	47.	28.27	1.68	1.284E-02	795.76	85.400	3.047E-02	CS134
911.31	320.	6.68	1.80	1.161E-02	911.07	29.000	6.707E-01	AC228
965.02	51.	22.61	1.80	1.113E-02	964.00	14.580	PBC<MDA	EU152
968.99	192.	8.41	1.80	1.109E-02	968.90	17.460	7.006E-01	AC228
1120.32	104.	20.99	1.69	9.970E-03	1120.28	15.040	4.909E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1460.88	1634.	2.52	2.29	8.190E-03	1460.75	10.700	1.327E+01	K40
1620.51	28.	30.54	0.75	7.569E-03	1620.56	2.750	9.602E-01	BI212
1764.82	63.	14.52	1.60	7.083E-03	1764.51	15.920	3.906E-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	
175.24	88.09	605.	101.	0.050	107.60	1.187	PB-214	D
179.39	90.17	518.	92.	0.046	109.90	1.189	PB-214	D
185.49	93.22	486.	188.	0.094	54.46	1.191	U-235	D
418.79	209.58	539.	128.	0.064	93.18	1.542	NP-239	s
477.06	238.84	339.	1135.	0.568	11.25	1.297	PB-212	D
482.40	241.51	665.	175.	0.087	66.69	1.299	PB-214	D
540.37	270.37	248.	130.	0.065	61.23	1.910	AC-228	s
600.55	300.46	304.	84.	0.042	94.36	1.511	PB-212	
656.46	328.42	194.	86.	0.043	80.17	1.772	RH-106M	s
1536.91	768.67	106.	90.	0.045	58.22	1.013	BI-214	sM
1929.77	965.02	41.	51.	0.026	67.78	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	149.51	74.92	1570.	238.	0.119	71.95	1.500s
PB-212	153.89	77.11	1386.	444.	0.222	38.36	1.500D
PB-214	153.89	77.11	1391.	439.	0.219	38.36	1.500D
EU-155	173.90	87.12	1272.	145.	0.072	107.49	1.500
TH-234	185.67	93.00	1159.	175.	0.087	81.81	1.500s
TH-234	185.62	92.98	1128.	164.	0.082	80.19	1.500s
PA-234	259.02	129.68	699.	98.	0.049	118.58	1.500s
RA-226	372.25	186.30	570.	158.	0.079	75.54	1.202s
TH-227	471.50	235.93	1041.	-131.	-0.065	108.19	1.500s
PB-212	477.06	238.71	676.	1126.	0.563	13.04	1.500s
PB-214	590.07	295.22	310.	213.	0.106	39.73	1.500
AC-228	676.68	338.53	331.	278.	0.139	40.75	1.612s
PB-214	703.69	352.04	237.	371.	0.185	23.13	1.500s
SB-125	925.65	463.03	132.	75.	0.038	70.72	1.500

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TL-208	1021.57	510.99	211.	137.	0.069	48.24	1.727s
TL-208	1166.28	583.35	177.	422.	0.211	22.58	1.878s
BI-214	1218.24	609.33	102.	308.	0.154	23.67	1.706s
CS-137	1322.66	661.54	191.	153.	0.077	61.04	1.733s
BI-212	1455.11	727.77	108.	89.	0.044	68.54	1.655s
CS-134	1589.87	795.15	66.	47.	0.023	84.81	1.684
AC-228	1822.19	911.31	52.	316.	0.158	20.04	1.798s
AC-228	1937.36	968.90	46.	190.	0.095	26.09	1.799D
BI-214	2240.21	1120.32	99.	103.	0.052	62.96	1.687s
K-40	2921.35	1460.88	17.	1629.	0.815	7.56	2.293
BI-212	3240.63	1620.51	11.	28.	0.014	91.62	0.755s
BI-214	3529.29	1764.82	6.	62.	0.031	43.55	1.599s

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

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

Nuclide Name	Nuclide Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		1.0494E-01					
			477.56	1.049E-01	%(	2.175E-01 6.60E-02	G
K-40		1.3271E+01					
			1460.75	1.327E+01	(P	1.773E-01 3.35E-01	G
MN-54		3.5603E-03					
			834.81	3.560E-03	%(P	2.549E-02 7.39E-03	G
CO-57		-5.6921E-03					
			122.07	-5.692E-03	&(P	3.186E-02 9.55E-03	G K
			136.43	5.781E-02	& P	2.483E-01 7.46E-02	G
CO-60		-1.8188E-03					
			1332.51	-1.819E-03	%(P	2.453E-02 6.47E-03	G K
			1173.23	7.110E-03	& P	3.282E-02 9.51E-03	G K
Sr-85		-9.3863E-03					
			514.00	-9.386E-03	&(	3.184E-02 9.53E-03	G
Kr-85		-2.3904E+02					
			513.99	-2.390E+02	&(P	7.213E+02 2.15E+02	G
Y-88		-3.9688E-03					
			1836.01	-3.969E-03	%(P	2.408E-02 6.55E-03	G K
			898.02	-9.977E-04	& P	2.995E-02 8.47E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	-5.7476E-03						
		871.10	-5.748E-03	%(P	2.676E-02	7.84E-03	G K
		702.50	-5.749E-04	% P	2.325E-02	6.63E-03	G K
Ag-108M	-1.7766E-02						
		722.95	-1.777E-02	&(	3.723E-02	1.13E-02	G K
		614.37	-1.707E-02	%	3.099E-02	9.46E-03	G
		433.93	1.818E-03	& P	2.451E-02	7.15E-03	G
CD-109	2.7346E-02						
		88.04	2.735E-02	%(P	9.960E-01	2.98E-01	G
SN-113	-9.7577E-03						
		391.71	-9.758E-03	%(P	3.416E-02	1.01E-02	G K
		255.04	-2.110E-01	%	1.137E+00	3.39E-01	G
SB-125	6.8519E-02						
		427.95	-1.144E-03	&(P	6.559E-02	1.89E-02	G K
		600.77	1.199E-02	% P	1.142E-01	3.30E-02	G
		636.15	-2.506E-03	% P	2.339E-01	6.74E-02	G
		463.51	2.747E-01	(P	2.061E-01	6.72E-02	G
		176.29	1.510E-01	% P	3.788E-01	1.14E-01	G
I-131	1.3875E-04						
		364.48	1.387E-04	%(	3.183E-02	9.29E-03	G K
		636.97	1.025E-01	%	2.905E-01	8.65E-02	G
		284.29	-6.125E-02	%	4.593E-01	1.36E-01	G
CS-134	1.3002E-02						
		604.66	-2.285E-03	%(P	5.487E-02	1.63E-02	G K
		795.76	3.047E-02	(P	2.648E-02	8.71E-03	G
		569.29	0.000E+00	%	1.537E-01	4.43E-02	G
		801.84	5.893E-02	% P	2.338E-01	6.84E-02	G
CS-137	8.7547E-02						
		661.62	8.755E-02	@(P	3.831E-02	1.82E-02	G
CE-139	2.3763E-03						
		165.85	2.376E-03	%(P	3.135E-02	9.34E-03	G
EU-152	2.0329E-04						
		121.78	2.033E-04	&(P	7.861E-02	2.33E-02	G K
		344.30	-1.719E-02	% P	7.922E-02	2.35E-02	G
		1408.08	2.382E-02	% P	1.011E-01	2.89E-02	G
		964.00	-1.895E-01	% P	3.384E-01	1.03E-01	G
		1112.07	-5.688E-02	% P	2.556E-01	7.50E-02	G
		778.90	-2.157E-02	% P	2.060E-01	5.96E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-154	-1.3299E-02						
		123.10	-1.330E-02	&(P	6.518E-02	1.95E-02	G K
		1274.80	-1.845E-03	& P	9.826E-02	2.80E-02	G
		723.30	3.309E-02	& P	1.194E-01	3.53E-02	G
		1004.80	4.761E-03	& P	1.576E-01	4.49E-02	G
EU-155	9.6183E-02						
		86.45	9.618E-02	(	1.123E-01	3.45E-02	G K
		105.31	4.024E-02	% P	1.312E-01	3.95E-02	G
HG-203	-4.0758E-04						
		279.17	-4.076E-04	%(P	2.908E-02	8.55E-03	G K
		72.87	-5.036E-01	% P	8.823E-01	2.68E-01	G
		70.83	3.632E-02	&	1.359E+00	4.06E-01	G
		82.50	-3.890E-01	%	1.758E+00	5.29E-01	G
TL-208	2.2037E-01						
		583.14	2.150E-01	(P	3.298E-02	1.64E-02	G
		510.72	2.408E-01	*(P	1.235E-01	4.82E-02	G
PB-212	5.9664E-01						
		238.63	5.848E-01	*(P	6.433E-02	2.58E-02	G K
							Energy duplication
		77.11	6.118E-01	*(	2.430E-01	7.82E-02	G
		74.81	6.221E-01	*(P	4.890E-01	1.52E-01	G
PB-214	2.9130E-01						
		351.99	2.940E-01	@(P	5.904E-02	2.30E-02	G K
		295.22	2.860E-01	(P	1.139E-01	3.87E-02	G
							Energy duplication
		77.11	9.898E-01	+ P	3.982E-01	1.28E-01	G
		241.92	-2.351E-01	% P	4.374E-01	1.33E-01	G
BI-212	3.9008E-01						
		727.17	3.901E-01	*(P	2.255E-01	9.05E-02	G K
		1620.56	9.602E-01	+ P	6.231E-01	2.99E-01	G
		785.42	5.883E-01	% P	1.302E+00	3.92E-01	G
BI-214	3.0272E-01						
		609.32	3.027E-01	@(P	4.905E-02	2.42E-02	G K
		1764.51	3.906E-01	+ P	9.117E-02	5.75E-02	G
		1120.28	4.909E-01	+ P	2.335E-01	1.04E-01	G
RA-224	4.7696E-01						
		241.00	4.770E-01	%(P	8.003E-01	2.44E-01	G
RA-226	9.5252E-01						
		185.99	9.525E-01	*(	6.871E-01	2.40E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AC-228	6.7768E-01						
		911.07	6.707E-01	@(P	7.682E-02	4.54E-02	G K
		968.90	7.006E-01	(P	1.264E-01	6.16E-02	G
		338.40	6.613E-01	@(P	2.079E-01	9.09E-02	G
TH-227	-2.5946E-01						
		236.00	-2.595E-01	?(P	3.039E-01	9.34E-02	G K
		256.25	-6.742E-03	% P	2.943E-01	8.62E-02	G
PA-234	3.9027E-02						
		98.44	-2.691E-03	%(	1.160E-01	3.46E-02	G K
		946.00	3.160E-02	&	1.450E-01	4.26E-02	G
		131.28	9.138E-02	&(	1.176E-01	3.61E-02	G
		94.67	-9.836E-02	%	2.172E-01	6.58E-02	G
		883.24	5.547E-02	%	1.759E-01	5.20E-02	G
		926.70	-1.063E-02	%	2.283E-01	6.51E-02	G
		569.26	0.000E+00	%	2.275E-01	6.56E-02	G
TH-234	9.1113E-01						
		63.29	4.087E-01	%(P	1.360E+00	4.08E-01	G K
		92.80	1.132E+00	(P	1.102E+00	3.39E-01	G
		92.38	1.416E+00	(P	1.307E+00	4.04E-01	G
AM-241	-1.9679E-02						
		59.54	-1.968E-02	%(P	1.578E-01	4.71E-02	G

(- This peak used in the nuclide activity average.

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

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation

Peak Codes:
G - Gamma Ray
X - X-Ray

I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

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

- -

***** 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	1.0187E-01	1.0494E-01	1.9791E-01	1.9801E-01	2.111E-01
K-40		1.3271E+01	1.3271E+01	1.0057E+00	1.2751E+00	
MN-54	#A	3.5423E-03	3.5603E-03	2.2174E-02	2.2175E-02	2.536E-02
CO-57	#B	-5.6588E-03	-5.6921E-03	2.9273E-02	2.9274E-02	3.167E-02
CO-60	#B	-1.8173E-03	-1.8188E-03	7.6135E-02	7.6135E-02	2.451E-02
Sr-85	#A	-9.1598E-03	-9.3863E-03	2.8589E-02	2.8595E-02	3.107E-02
Kr-85	#A	-2.3904E+02	-2.3904E+02	8.1227E+02	8.1239E+02	7.213E+02
Y-88	#B	-3.9102E-03	-3.9688E-03	3.0570E-02	3.0571E-02	2.372E-02
NB-94	#B	-5.7476E-03	-5.7476E-03	2.4204E-02	2.4206E-02	2.676E-02
Ag-108M	#B	-1.7765E-02	-1.7766E-02	3.3860E-02	3.3876E-02	3.723E-02
CD-109	#A	2.7251E-02	2.7346E-02	8.9353E-01	8.9353E-01	9.925E-01
SN-113	#B	-9.6243E-03	-9.7577E-03	3.6686E-02	3.6691E-02	3.370E-02
SB-125	#F	6.8412E-02	6.8519E-02	5.0272E-02	5.0435E-02	6.549E-02
I-131	#B	1.1393E-04	1.3875E-04	2.7874E-02	2.7874E-02	2.614E-02
CS-134	#B	1.2974E-02	1.3002E-02	1.1152E-02	1.1178E-02	5.476E-02
CS-137	#	8.7535E-02	8.7547E-02	5.4673E-02	5.4917E-02	
CE-139	#A	2.3491E-03	2.3763E-03	2.8032E-02	2.8032E-02	3.099E-02
EU-152	#B	2.0323E-04	2.0329E-04	6.9984E-02	6.9984E-02	7.858E-02
EU-154	#B	-1.3292E-02	-1.3299E-02	6.0904E-02	6.0909E-02	6.515E-02
EU-155	#A	9.6099E-02	9.6183E-02	1.0338E-01	1.0352E-01	1.122E-01
HG-203	#B	-3.9395E-04	-4.0758E-04	6.6441E-02	6.6441E-02	2.811E-02
TL-208		2.2037E-01	2.2037E-01	5.0289E-02	5.1946E-02	
PB-212	#	5.9664E-01	5.9664E-01	7.8874E-02	8.6388E-02	6.433E-02
PB-214	#	2.9130E-01	2.9130E-01	6.8256E-02	7.0391E-02	5.904E-02
BI-212	#	3.9008E-01	3.9008E-01	2.7126E-01	2.7224E-01	
BI-214		3.0272E-01	3.0272E-01	7.2662E-02	7.4830E-02	
RA-224	#A	4.7696E-01	4.7696E-01	7.3109E-01	7.3163E-01	8.003E-01
RA-226	#	9.5252E-01	9.5252E-01	7.1958E-01	7.2178E-01	
AC-228		6.7768E-01	6.7768E-01	1.1970E-01	1.2622E-01	
TH-227	#A	-2.5946E-01	-2.5946E-01	2.8129E-01	2.8170E-01	3.039E-01
PA-234	#B	3.9027E-02	3.9027E-02	4.6280E-02	4.6331E-02	1.160E-01
TH-234	#B	9.1113E-01	9.1113E-01	7.7936E-01	7.8099E-01	1.360E+00
AM-241	#A	-1.9679E-02	-1.9679E-02	1.5299E-01	1.5299E-01	1.578E-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 (1029.7 to 2000.1 keV) 1.5901563E+01 pCi/gm
Total Decayed Activity (1029.7 to 2000.1 keV) 1.5901578E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_17JUL2006_1810.An1

Sample description
FSS-OOL-14-01-022-F

Spectrum Filename: C:\GammaVision\Spectra\107F_17JUL2006_1810.An1

Acquisition information
Start time: 17-Jul-2006 18:10:12
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: 1.2070E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.2070E+03) =
8.2850E+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	13-Jul-2006 09:10:00
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. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1238

***** 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	252.	13.94	1.18	2.849E-02	74.81	9.600	1.032E+00	PB212
77.04	280.	12.18	1.18	2.957E-02	77.11	17.500	9.000E-01	PB212
					77.11	10.700	1.455E+00	PB214
77.29	113.	37.54	1.50	2.957E-02	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	PBC<MDA	PB214
87.10	163.	19.67	1.19	3.305E-02	86.45	32.740	1.701E-01	EU155
					88.04	3.790	1.455E+00	CD109
90.06	108.	28.65	1.19	3.379E-02				
90.06	108.	28.65	1.19	3.379E-02	92.38	2.570	PBC<MDA	TH234
93.27	177.	17.99	1.19	3.451E-02	92.80	3.000	1.708E+00	TH234
185.95	156.	23.81	1.53	3.610E-02	185.99	3.280	1.479E+00	RA226
209.42	100.	36.53	1.02	3.427E-02				
238.75	998.	3.81	1.30	3.189E-02	238.63	43.100	8.002E-01	PB212
241.75	146.	19.16	1.30	3.165E-02	241.00	3.900	1.298E+00	RA224
					241.92	7.470	6.831E-01	PB214
269.45	77.	38.59	0.85	2.950E-02				
277.07	93.	30.06	1.21	2.894E-02				
295.44	268.	13.28	1.30	2.766E-02	295.22	19.200	5.545E-01	PB214
327.95	78.	37.58	1.43	2.561E-02				
338.75	192.	15.57	1.22	2.498E-02	338.40	12.010	7.038E-01	AC228
352.13	430.	7.14	1.36	2.425E-02	351.99	37.100	5.289E-01	PB214
463.36	94.	17.93	1.70	1.953E-02				
463.36	94.	17.93	1.70	1.953E-02	463.51	10.000	5.221E-01	SB125
510.55	173.	15.45	2.00	1.809E-02	510.72	22.500	3.840E-01	TL208
583.35	339.	7.12	1.34	1.629E-02	583.14	86.000	2.672E-01	TL208
609.42	318.	8.60	1.58	1.574E-02	609.32	46.090	4.837E-01	BI214
662.25	191.	12.45	1.26	1.476E-02	661.62	84.620	1.680E-01	CS137

726.90	92.	19.21	2.15	1.375E-02	722.95	90.499	8.246E-02	Ag108M
					723.30	19.700	3.775E-01	EU154
					727.17	11.800	6.263E-01	BI212
795.23	28.	40.85	1.68	1.284E-02	795.76	85.400	PBC<MDA	CS134
860.64	79.	19.47	1.83	1.211E-02				
911.42	292.	8.41	1.59	1.160E-02	911.07	29.000	9.584E-01	AC228
933.95	47.	30.66	0.88	1.140E-02				

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
968.70	194.	13.71	1.78	1.109E-02	968.90	17.460	1.106E+00	AC228
1120.30	47.	25.70	1.90	9.970E-03	1120.28	15.040	3.482E-01	BI214
1461.10	1237.	2.95	2.19	8.189E-03	1460.75	10.700	1.574E+01	K40
1764.87	50.	16.98	2.29	7.084E-03	1764.51	15.920	4.962E-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	
173.88	87.21	432.	164.	0.082	58.64	1.187	PB-214	D
179.79	90.17	424.	108.	0.054	85.91	1.189	PB-214	D
186.22	93.39	418.	178.	0.089	53.71	1.191	U-235	D
418.47	209.42	441.	100.	0.050	109.60	1.016	AC-228	s
538.53	269.45	286.	77.	0.038	115.76	0.852	AC-228	s
553.76	277.07	253.	93.	0.046	79.23	1.205	TL-208	s
655.52	327.95	252.	78.	0.039	112.74	1.427	AC-228	s
1720.85	860.64	45.	79.	0.040	58.40	1.828	TL-208	s
1867.47	933.95	40.	51.	0.025	68.01	0.883	BI-214	s

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

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.29	74.81	513.	252.	0.126	41.83	1.178D
PB-212	153.89	77.11	541.	280.	0.140	36.55	1.179A
PB-214	153.89	77.11	904.	113.	0.057	112.61	1.500A
EU-155	174.18	87.26	1045.	151.	0.076	93.87	1.500s
CD-109	174.16	87.25	954.	150.	0.075	90.35	1.500s
TH-234	185.96	93.15	932.	146.	0.073	80.60	1.500s
RA-226	371.53	185.95	456.	156.	0.078	71.42	1.528s
TH-227	471.82	236.09	935.	-134.	-0.067	100.60	1.500s
PB-212	476.89	238.63	241.	982.	0.491	11.44	1.297D
RA-224	482.70	241.53	680.	93.	0.047	119.57	1.500
PB-214	483.47	241.92	355.	129.	0.065	66.54	1.299D
PB-214	590.51	295.44	326.	263.	0.132	39.84	1.305
AC-228	677.11	338.75	237.	189.	0.094	46.72	1.223s
PB-214	703.86	352.13	182.	425.	0.213	21.41	1.356
SB-125	926.23	463.32	98.	77.	0.039	61.55	1.500s
TL-208	1020.70	510.55	184.	140.	0.070	46.35	2.002s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TL-208	1166.28	583.35	95.	334.	0.167	21.36	1.342
BI-214	1218.48	609.45	102.	267.	0.134	23.90	1.558s
CS-137	1324.08	662.25	108.	187.	0.094	37.35	1.262s
BI-212	1453.36	726.90	77.	91.	0.045	57.64	2.149s
CS-134	1590.03	795.23	55.	28.	0.014	122.56	1.684
AC-228	1822.39	911.42	71.	288.	0.144	25.24	1.594s
AC-228	1936.95	968.70	109.	191.	0.096	41.12	1.782
BI-214	2240.16	1120.30	52.	47.	0.023	77.10	1.897s
K-40	2921.79	1461.10	27.	1232.	0.616	8.85	2.194
BI-214	3529.38	1764.87	13.	50.	0.025	50.95	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	Code	MDA Value pCi/gm	COMMENTS
BE-7		4.0298E-02					
			477.56	4.030E-02	%(	3.133E-01 9.15E-02 G	
K-40		1.5736E+01					
			1460.75	1.574E+01	(P	3.447E-01 4.66E-01 G	
MN-54		1.4616E-02					
			834.81	1.462E-02	%(P	4.021E-02 1.20E-02 G	
CO-57		-1.5815E-03					
			122.07	-1.581E-03	%(P	4.342E-02 1.29E-02 G K	
			136.43	-1.124E-02	& P	3.512E-01 1.04E-01 G	
CO-60		-3.8315E-03					
			1332.51	-3.831E-03	&(P	3.646E-02 9.44E-03 G K	
			1173.23	-6.821E-03	& P	4.445E-02 1.22E-02 G K	
Sr-85		-1.5436E-02					
			514.00	-1.544E-02	%(	4.762E-02 1.43E-02 G	
Kr-85		-3.8344E+02					
			513.99	-3.834E+02	%(P	1.056E+03 3.14E+02 G	
Y-88		-2.9136E-04					
			1836.01	-2.914E-04	%(P	2.593E-02 6.26E-03 G K	
			898.02	8.666E-03	% P	3.688E-02 1.07E-02 G	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	-1.6652E-04						
		871.10	-1.665E-04	%(P	2.421E-02	6.57E-03	G K
		702.50	-4.332E-03	% P	3.860E-02	1.12E-02	G K
Ag-108M	-5.5436E-03						
		722.95	-5.544E-03	%(	4.553E-02	1.33E-02	G K
		614.37	-1.482E-02	%	4.615E-02	1.38E-02	G
		433.93	-5.355E-03	% P	3.699E-02	1.08E-02	G
CD-109	1.3439E+00						
		88.04	1.344E+00	(P	1.311E+00	4.06E-01	G
SN-113	6.3885E-03						
		391.71	6.388E-03	&(P	3.919E-02	1.14E-02	G K
		255.04	3.644E-01	%	1.523E+00	4.54E-01	G
SB-125	1.0502E-01						
		427.95	-9.536E-03	&(P	1.168E-01	3.40E-02	G K
		600.77	-2.913E-02	% P	1.646E-01	4.73E-02	G
		636.15	-9.506E-03	& P	2.834E-01	8.05E-02	G
		463.51	4.441E-01	(P	2.803E-01	9.44E-02	G
		176.29	8.069E-02	% P	5.475E-01	1.63E-01	G
I-131	2.0605E-02						
		364.48	2.061E-02	%(	3.760E-02	1.15E-02	G K
		636.97	-5.268E-02	%	6.448E-01	1.86E-01	G
		284.29	-1.009E-02	%	7.812E-01	2.29E-01	G
CS-134	1.5003E-02						
		604.66	2.828E-03	%(P	7.988E-02	2.37E-02	G K
		795.76	2.892E-02	(P	3.823E-02	1.20E-02	G
		569.29	5.283E-02	%	1.851E-01	5.47E-02	G
		801.84	1.081E-02	& P	3.847E-01	1.09E-01	G
CS-137	1.6797E-01						
		661.62	1.680E-01	@(P	4.572E-02	2.13E-02	G
CE-139	2.8906E-03						
		165.85	2.891E-03	&(P	4.412E-02	1.31E-02	G
EU-152	-4.4437E-03						
		121.78	-4.444E-03	&(P	1.266E-01	3.76E-02	G K
		344.30	-1.705E-02	& P	1.184E-01	3.49E-02	G
		1408.08	5.749E-02	% P	1.574E-01	4.64E-02	G
		964.00	-1.218E-02	& P	3.649E-01	1.05E-01	G
		1112.07	8.507E-02	& P	2.640E-01	7.78E-02	G
		778.90	3.885E-02	& P	2.569E-01	7.41E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-154	-2.9205E-02						
		123.10	-2.921E-02	%(P	8.906E-02	2.68E-02	G K
		1274.80	-1.166E-03	& P	1.297E-01	3.64E-02	G
		723.30	-3.830E-02	% P	2.259E-01	6.62E-02	G
		1004.80	-2.130E-03	& P	2.425E-01	6.87E-02	G
EU-155	1.5785E-01						
		86.45	1.578E-01	(	1.600E-01	4.94E-02	G K
		105.31	2.485E-02	% P	1.853E-01	5.54E-02	G
HG-203	-6.5941E-04						
		279.17	-6.594E-04	&(P	4.392E-02	1.29E-02	G K
		72.87	-3.833E-01	% P	1.285E+00	3.88E-01	G
		70.83	-7.581E-01	%	1.977E+00	5.98E-01	G
		82.50	-3.024E-02	%	2.504E+00	7.46E-01	G
TL-208	2.6721E-01						
		583.14	2.672E-01	(P	3.840E-02	1.93E-02	G
		510.72	3.840E-01	+ P	1.816E-01	7.36E-02	G
PB-212	8.2903E-01						
		238.63	8.002E-01	(P	6.107E-02	3.10E-02	G K
							Energy duplication
		77.11	6.063E-01	}	2.403E-01	7.39E-02	G
		74.81	1.032E+00	+ P	4.430E-01	1.46E-01	G
PB-214	5.4630E-01						
		351.99	5.289E-01	(P	8.154E-02	3.82E-02	G K
		295.22	5.545E-01	(P	1.829E-01	7.49E-02	G
							Energy duplication
		77.11	4.000E-01	} P	5.052E-01	1.50E-01	G
		241.92	6.114E-01	(P	4.289E-01	1.37E-01	G
BI-212	6.2629E-01						
		727.17	6.263E-01	@(P	3.016E-01	1.22E-01	G K
		1620.56	1.405E-01	% P	1.098E+00	2.99E-01	G
		785.42	9.047E-01	% P	1.699E+00	5.17E-01	G
BI-214	4.3380E-01						
		609.32	4.123E-01	@(P	7.695E-02	3.34E-02	G K
		1764.51	4.962E-01	(P	1.923E-01	8.58E-02	G
		1120.28	3.482E-01	- P	2.704E-01	9.12E-02	G
RA-224	8.4501E-01						
		241.00	8.450E-01	?(P	1.125E+00	3.45E-01	G
RA-226	1.4788E+00						
		185.99	1.479E+00	(	9.661E-01	3.52E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AC-228	1.0139E+00						
		911.07	9.584E-01	@(P	1.395E-01	8.19E-02	G K
		968.90	1.106E+00	(P	2.965E-01	1.53E-01	G
		338.40	7.038E-01	- P	2.777E-01	1.12E-01	G
TH-227	-4.1641E-01						
		236.00	-4.164E-01	?(P	4.521E-01	1.39E-01	G K
		256.25	9.324E-02	% P	4.472E-01	1.33E-01	G
PA-234	6.2777E-02						
		98.44	6.278E-02	%(	1.582E-01	4.78E-02	G K
		946.00	4.583E-02	&	1.863E-01	5.46E-02	G
		131.28	8.039E-02	%	1.662E-01	5.04E-02	G
		94.67	-1.514E-01	%	3.197E-01	9.70E-02	G
		883.24	4.551E-02	%	3.140E-01	9.08E-02	G
		926.70	-6.330E-02	&	3.226E-01	9.36E-02	G
		569.26	7.808E-02	%	2.735E-01	8.09E-02	G
TH-234	1.0645E+00						
		63.29	6.615E-01	&(P	2.068E+00	6.21E-01	G K
		92.80	1.588E+00	(P	1.573E+00	4.84E-01	G
		92.38	1.466E-01	% P	1.785E+00	5.32E-01	G
AM-241	5.4214E-02						
		59.54	5.421E-02	%(P	2.616E-01	7.85E-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
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

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

- -

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

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	3.8073E-02	4.0298E-02	2.7438E-01	2.7439E-01	2.960E-01
K-40		1.5736E+01	1.5736E+01	1.3980E+00	1.6787E+00	
MN-54	#A	1.4475E-02	1.4616E-02	3.6017E-02	3.6027E-02	3.982E-02
CO-57	#B	-1.5638E-03	-1.5815E-03	4.3733E-02	4.3733E-02	4.293E-02
CO-60	#B	-3.8254E-03	-3.8315E-03	2.5026E-01	2.5026E-01	3.640E-02
Sr-85	#A	-1.4731E-02	-1.5436E-02	4.2815E-02	4.2825E-02	4.545E-02
Kr-85	#A	-3.8343E+02	-3.8344E+02	1.1834E+03	1.1837E+03	1.056E+03
Y-88	#B	-2.8319E-04	-2.9136E-04	2.8894E-02	2.8894E-02	2.521E-02
NB-94	#B	-1.6652E-04	-1.6652E-04	1.4582E-01	1.4582E-01	2.421E-02
Ag-108M	#B	-5.5432E-03	-5.5436E-03	3.9805E-02	3.9807E-02	4.553E-02
CD-109	#	1.3349E+00	1.3439E+00	1.2168E+00	1.2190E+00	1.302E+00
SN-113	#B	6.2223E-03	6.3885E-03	3.4221E-02	3.4223E-02	3.817E-02
SB-125	#B	1.0470E-01	1.0502E-01	6.6989E-02	6.7276E-02	1.165E-01
I-131	#B	1.4131E-02	2.0605E-02	3.4503E-02	3.4525E-02	2.579E-02
CS-134	#B	1.4943E-02	1.5003E-02	1.8732E-02	1.8753E-02	7.956E-02
CS-137	#	1.6792E-01	1.6797E-01	6.3914E-02	6.4679E-02	
CE-139	#A	2.8276E-03	2.8906E-03	3.9347E-02	3.9348E-02	4.316E-02
EU-152	#B	-4.4408E-03	-4.4437E-03	1.2027E-01	1.2027E-01	1.265E-01
EU-154	#B	-2.9177E-02	-2.9205E-02	8.2636E-02	8.2651E-02	8.897E-02
EU-155	#A	1.5758E-01	1.5785E-01	1.4817E-01	1.4842E-01	1.597E-01
HG-203	#B	-6.1786E-04	-6.5941E-04	1.0010E-01	1.0010E-01	4.115E-02
TL-208		2.6721E-01	2.6721E-01	5.7848E-02	5.9962E-02	
PB-212		8.2903E-01	8.2903E-01	9.6318E-02	1.0805E-01	
PB-214		5.4630E-01	5.4630E-01	1.1835E-01	1.2267E-01	
BI-212	#	6.2629E-01	6.2629E-01	3.6609E-01	3.6795E-01	
BI-214	#	4.3380E-01	4.3380E-01	1.0534E-01	1.0841E-01	7.695E-02
RA-224	#A	8.4501E-01	8.4501E-01	1.0346E+00	1.0358E+00	1.125E+00
RA-226		1.4788E+00	1.4788E+00	1.0562E+00	1.0598E+00	
AC-228		1.0139E+00	1.0139E+00	2.4771E-01	2.5485E-01	
TH-227	#A	-4.1641E-01	-4.1641E-01	4.1976E-01	4.2048E-01	4.521E-01
PA-234	#B	6.2777E-02	6.2777E-02	1.4344E-01	1.4349E-01	1.582E-01
TH-234	#B	1.0645E+00	1.0645E+00	9.7360E-01	9.7539E-01	2.068E+00
AM-241	#A	5.4213E-02	5.4214E-02	2.3538E-01	2.3540E-01	2.616E-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 (269.2 to 2000.1 keV) 2.0665928E+01 pCi/gm
Total Decayed Activity (269.2 to 2000.1 keV) 2.0665981E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab