```
*********************************************************************
*****        G A M M A   S P E C T R U M   A N A L Y S I S        *****
*********************************************************************
```

Filename: ERT01,C:\GENIE2K\CAMFILES\SMP-NFB-A04-S001-0006-01.CNF

Report Generated On	: 6/1/2017 8:10:12 AM
Sample Title	: NFB-A04-S001-0006-01
Sample Description	: 450 cc Soil
Sample Identification	:
Sample Type	:
Sample Geometry	:
Peak Locate Threshold	: 3.00
Peak Locate Range (in channels)	: 100 - 8192
Peak Area Range (in channels)	: 100 - 8192
Identification Energy Tolerance	: 1.000 keV
Sample Size	: 8.963E+002 GWET
Sample Taken On	: 5/11/2017 2:00:00 PM
Acquisition Started	: 6/1/2017 6:10:07 AM
Live Time	: 7200.0 seconds
Real Time	: 7201.4 seconds
Dead Time	: 0.02 %

Energy Calibration Used Done On	: 5/10/2017
Efficiency Calibration Used Done On	: 12/14/2016
Efficiency ID	: ERT0101

****
***** P E A K A N A L Y S I S R E P O R T *****
****

Detector Name: ERT01
Sample Title: NFB-A04-S001-0006-01
Peak Analysis Performed on: 6/1/2017 8:10:12 AM
Peak Analysis From Channel: 100
Peak Analysis To Channel: 8192

	Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
	1	306-	315	309.41	77.21	1.18	1.09E+002	22.52	1.72E+002
M	2	357-	380	360.89	90.08	1.17	1.82E+001	5.34	1.92E+002
m	3	357-	380	371.19	92.65	1.18	1.50E+002	9.40	2.60E+002
	4	729-	749	744.47	185.94	0.62	1.26E+002	33.22	2.68E+002
	5	948-	960	954.95	238.55	1.19	2.90E+002	27.42	1.76E+002
	6	1173-	1191	1180.75	294.98	0.69	1.61E+002	24.22	1.26E+002
	7	1195-	1207	1200.50	299.91	0.87	2.22E+001	15.03	7.68E+001
	8	1347-	1358	1353.27	338.10	1.15	6.79E+001	14.80	6.01E+001
	9	1395-	1417	1407.71	351.70	1.36	2.84E+002	25.86	9.95E+001
	10	2033-	2055	2042.11	510.25	1.21	2.33E+002	24.45	9.40E+001
	11	2324-	2340	2331.70	582.62	1.61	1.31E+002	17.31	5.42E+001
	12	2430-	2446	2436.35	608.78	1.09	1.94E+002	19.31	5.73E+001
	13	2903-	2916	2907.68	726.57	1.62	3.44E+001	10.51	2.76E+001
	14	3635-	3654	3644.93	910.83	1.54	1.22E+002	14.25	2.28E+001
	15	3868-	3884	3875.69	968.50	1.39	7.11E+001	11.41	1.89E+001
	16	4475-	4489	4481.33	1119.86	1.25	4.99E+001	10.92	2.41E+001
	17	5506-	5517	5511.96	1377.43	0.36	3.10E+001	6.23	3.00E+000
	18	5835-	5856	5845.42	1460.77	1.36	4.80E+002	23.45	1.88E+001
	19	7054-	7069	7061.85	1764.78	0.89	5.40E+001	9.17	9.98E+000

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet

Errors quoted at 1.000 sigma

****
***** N U C L I D E M D A R E P O R T *****
****

Detector Name: ERT01
Sample Geometry:
Sample Title: NFB-A04-S001-0006-01
Nuclide Library Used: C:\GENIE2K\CAMFILES\ERT_LIBRARY_LMDA.NLB

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GWET)	Nuclide MDA (pCi/GWET)	Activity (pCi/GWET)
+	K-40	1460.82*	10.55	3.3147E-001	3.31E-001	3.2269E+000
	Co-60	1173.23	99.85	3.8624E-002	3.73E-002	5.9696E-003
		1332.49	99.98	3.7324E-002		-1.2262E-003
>		2505.71	0.10	0.0000E+000		0.0000E+000
	Cs-137	32.06	5.54	1.9675E+003	3.65E-002	3.5236E+002
		661.66	84.99	3.6546E-002		2.3356E-002
+	Tl-208	72.80	2.02	3.0163E+000	2.96E-002	4.2484E-001
		74.97	3.41	1.8122E+000		-9.8448E-001
		84.90	1.51	2.6988E+000		2.1399E-001
		277.36	6.31	4.4557E-001		-6.6763E-002
		510.77*	22.60	1.7864E-001		9.8746E-002
		583.19*	84.50	2.9594E-002		5.6054E-002
		763.13	1.81	2.1190E+000		1.1398E+000
		860.56	12.42	2.8271E-001		8.4010E-002
+	Bi-212	39.86	1.06	3.5920E+002	2.83E-001	-5.0131E+001
		727.33*	6.74	2.8305E-001		2.2494E-001
		785.37	1.11	2.9145E+000		3.0262E-001
		1620.74	1.51	2.1694E+000		9.8691E-001
		1806.00	0.09	3.0318E+001		-7.4394E+000
+	Pb-212	74.81	10.40	5.9487E-001	5.80E-002	-3.2403E-001
		77.11*	17.50	1.9036E-001		2.1720E-001
		87.30	7.81	4.9938E-001		5.4087E-002
		115.18	0.59	4.5513E+000		-2.8026E+000
		238.63*	43.30	5.7987E-002		1.4646E-001
		300.09*	3.28	5.6233E-001		1.8057E-001
+	Bi-214	76.86*	0.43	7.6611E+000	5.49E-002	8.7416E+000
		89.81*	0.24	9.4591E+000		1.8350E+000
		386.77	0.30	9.1330E+000		2.0411E+000
		454.77	0.29	9.1635E+000		-3.3188E+000
		609.31*	45.49	5.4888E-002		1.6371E-001
		665.45	1.53	1.9722E+000		6.8494E-001
		703.11	0.48	6.4528E+000		-3.8748E+000
		719.86	0.39	7.9290E+000		-3.7561E+000
		768.36	4.89	7.5687E-001		5.4713E-001
		786.10	0.31	1.0140E+001		4.0212E+000
		806.17	1.26	2.5360E+000		-1.7146E+000
		934.06	3.10	1.1280E+000		1.2338E-001
		964.08	0.36	1.2287E+001		-4.5013E-001
		1051.96	0.31	1.2517E+001		5.9319E+000
		1120.29*	14.91	1.6767E-001		2.0175E-001

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GWET)	Nuclide MDA (pCi/GWET)	Activity (pCi/GWET)
+	Bi-214	1133.66	0.25	1.4923E+001	5.49E-002	4.0235E+000
		1155.19	1.63	2.4079E+000		-6.0485E-001
		1207.68	0.45	9.1422E+000		7.0940E-001
		1238.11	5.79	7.8001E-001		2.9537E-002
		1280.96	1.43	2.6131E+000		6.5647E-001
		1377.67*	4.00	2.7760E-001		5.4799E-001
		1385.31	0.76	4.4388E+000		-5.0434E+000
		1401.50	1.27	2.5845E+000		-1.1190E+000
		1407.98	2.15	1.5309E+000		5.1773E-001
		1509.23	2.11	1.6143E+000		-4.6636E-001
		1538.50	0.38	8.4148E+000		-2.5984E+000
		1543.32	0.20	1.6051E+001		-4.6630E+000
		1583.22	0.69	5.2413E+000		-9.8443E-001
		1594.73	0.25	1.5253E+001		9.6693E+000
		1599.31	0.23	1.2446E+001		9.9054E-001
		1661.28	1.15	2.7426E+000		4.1662E-001
		1683.99	0.22	1.3811E+001		-1.8412E-001
		1729.59	2.92	1.1288E+000		1.2656E-001
		1764.49*	15.40	1.6325E-001		2.5588E-001
		1847.42	2.11	1.6762E+000		1.1658E+000
		1873.16	0.22	1.2562E+001		8.2364E+000
>		2118.55	1.14	0.0000E+000		0.0000E+000
>		2204.21	5.08	0.0000E+000		0.0000E+000
+	Pb-214	53.28	1.20	1.8723E+001	7.25E-002	7.5880E+000
		74.81	6.44	9.4117E-001		-5.1265E-001
		77.11*	10.80	3.0219E-001		3.4481E-001
		87.30	4.84	7.8947E-001		8.5506E-002
		242.00	7.43	5.5443E-001		-2.3177E-001
		258.87	0.52	5.0372E+000		3.0203E+000
		274.80	0.47	6.0304E+000		1.6195E+000
		295.22*	19.30	1.3246E-001		2.1673E-001
		351.93*	37.60	7.2476E-002		2.0995E-001
		462.00	0.22	1.3466E+001		5.9801E+000
		533.66	0.19	1.4515E+001		7.8600E+000
		785.96	1.07	2.9358E+000		1.1643E+000
		839.04	0.59	5.8805E+000		1.3362E+000
	Ra-224	81.07	0.13	3.2393E+001	1.04E+000	-1.3016E+001
		83.78	0.22	1.8623E+001		-4.5220E+000
		240.99	4.10	1.0385E+000		-4.2096E-001
+	Ra-226	81.07	0.20	2.1103E+001	8.74E-001	-8.4797E+000
		83.78	0.33	1.2071E+001		-2.9310E+000
		94.90	0.15	2.4671E+001		8.7233E-002
		186.21*	3.59	8.7445E-001		4.3560E-001
	Ac-228	99.50	1.26	2.3867E+000	1.86E-001	7.0909E-001
		129.07	2.50	1.1269E+000		4.9266E-001
		209.25	3.97	7.3055E-001		9.0849E-002
		270.24	3.55	8.1631E-001		-1.4054E-001
		328.00	3.04	9.7251E-001		1.8820E-001
		338.32	11.40	2.7442E-001		2.0652E-001
		409.46	2.02	1.3994E+000		4.4798E-001

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GWET)	Nuclide MDA (pCi/GWET)	Activity (pCi/GWET)
Ac-228	463.00	4.45	6.9806E-001	1.86E-001	1.2490E-001
	755.31	1.03	3.0393E+000		1.6403E+000
	772.29	1.52	2.3176E+000		-6.3063E-001
	794.94	4.31	7.6775E-001		1.1891E-001
	835.70	1.70	1.9357E+000		-1.2657E+000
	911.20	26.20	1.8622E-001		2.1735E-001
	964.79	4.99	9.2171E-001		1.0675E-001
	968.96	15.90	2.8664E-001		1.9894E-001
	1588.20	3.06	1.3051E+000		2.3270E-001
	1630.62	1.52	2.1902E+000		-3.6239E-001
Th-228	84.37	1.26	3.2513E+000	3.25E+000	4.4417E-001
	131.61	0.13	2.1247E+001		1.1594E+001
	166.41	0.10	2.4377E+001		-1.0603E+001
	215.98	0.25	1.0900E+001		1.9775E+000
Pa-234m	258.23	0.07	3.5455E+001	4.14E+000	2.2620E+000
	742.81	0.09	3.3147E+001		2.1356E+001
	766.36	0.32	1.1294E+001		4.9840E+000
	786.27	0.05	5.8349E+001		3.3250E+001
	1001.03	0.85	4.1389E+000		2.4368E-001
	1737.77	0.02	1.2876E+002		-1.3216E+002
Th-234	63.30	3.75	2.5232E+000	8.88E-001	4.5466E-002
	92.59	4.33	8.8787E-001		-1.7432E-002
	112.81	0.22	1.2532E+001		8.4739E-001

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = Calculated MDA is zero due to zero counts in the region, or the region is outside the spectrum, or has not been calculated
@ = Half-life too short to be able to perform the decay correction

****
***** N U C L I D E I D E N T I F I C A T I O N R E P O R T *****
****

Sample Title: NFB-A04-S001-0006-01
Nuclide Library Used: C:\GENIE2K\CAMFILES\ERT_LIBRARY_LMDA.NLB

..... IDENTIFIED NUCLIDES .....

Nuclide Name	Id Confidence	Energy (keV)		Yield (%)	Activity (pCi/GWET)	Activity Uncertainty
K-40	1.000	1460.82*		10.55	3.22694E+000	1.86300E-001
Eu-152m	0.991	89.85*		69.90	6.42400E-003	1.89208E-003
Tl-208	0.638	72.80	@	2.02		
		74.97	@	3.41		
		84.90	@	1.51		
		277.36		6.31		
		510.77*	@	22.60	9.87458E-002	3.96369E-002
		583.19*		84.50	5.60535E-002	8.10019E-003
		763.13	@	1.81		
		860.56		12.42		
Bi-211	0.931	351.03*		13.00	6.08325E-001	6.11614E-002
Bi-212	0.523	39.86	@	1.06		
		727.33*		6.74	2.24943E-001	6.91093E-002
		785.37		1.11		
		1620.74		1.51		
		1806.00	@	0.09		
Pb-212	0.662	74.81		10.40		
		77.11*		17.50	2.17202E-001	4.57739E-002
		87.30		7.81		
		115.18	@	0.59		
		238.63*		43.30	1.46460E-001	1.58377E-002
		300.09*		3.28	1.80568E-001	1.22502E-001
Bi-214	0.526	76.86*	@	0.43	8.74157E+000	1.84461E+000
		89.81*	@	0.24	1.83504E+000	5.44474E-001
		386.77	@	0.30		
		454.77	@	0.29		
		609.31*		45.49	1.63715E-001	1.70199E-002
		665.45	@	1.53		
		703.11	@	0.48		
		719.86	@	0.39		
		768.36		4.89		
		786.10	@	0.31		
		806.17	@	1.26		
		934.06		3.10		
		964.08	@	0.36		
		1051.96	@	0.31		
		1120.29*		14.91	2.01746E-001	4.44487E-002
		1133.66	@	0.25		
		1155.19	@	1.63		
		1207.68	@	0.45		
		1238.11		5.79		

Nuclide Name	Id Confidence	Energy (keV)		Yield (%)	Activity (pCi/GWET)	Activity Uncertainty
Bi-214	0.526	1280.96	@	1.43		
		1377.67*		4.00	5.47988E-001	1.11289E-001
		1385.31	@	0.76		
		1401.50	@	1.27		
		1407.98	@	2.15		
		1509.23	@	2.11		
		1538.50	@	0.38		
		1543.32	@	0.20		
		1583.22	@	0.69		
		1594.73	@	0.25		
		1599.31	@	0.23		
		1661.28	@	1.15		
		1683.99	@	0.22		
		1729.59	@	2.92		
		1764.49*		15.40	2.55881E-001	4.95117E-002
		1847.42	@	2.11		
		1873.16	@	0.22		
		2118.55	@	1.14		
		2204.21	@	5.08		
Pb-214	0.600	53.28	@	1.20		
		74.81		6.44		
		77.11*		10.80	3.44806E-001	7.31187E-002
		87.30		4.84		
		242.00		7.43		
		258.87	@	0.52		
		274.80	@	0.47		
		295.22*		19.30	2.16734E-001	3.33624E-002
		351.93*		37.60	2.09952E-001	2.10035E-002
		462.00	@	0.22		
		533.66	@	0.19		
		785.96	@	1.07		
		839.04	@	0.59		
Ra-226	0.767	81.07	@	0.20		
		83.78	@	0.33		
		94.90	@	0.15		
		186.21*		3.59	4.35596E-001	1.91900E-001

* = Energy line found in the spectrum.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.45
Errors quoted at 1.000 sigma

****
***** I N T E R F E R E N C E C O R R E C T E D R E P O R T *****
****

Nuclide Name		Nuclide Id Confidence	Wt mean Activity (pCi/GWET)	Wt mean Activity Uncertainty
K-40		1.000	3.226941E+000	1.862998E-001
Eu-152m		0.991	5.782056E-003	1.892009E-003
Tl-208	@	0.638	5.605354E-002	8.100193E-003
Bi-211		0.931	3.264904E-002	1.071068E-001
Bi-212	@	0.523	2.249434E-001	6.910930E-002
Pb-212	@	0.662	1.406823E-001	1.493497E-002
Bi-214	@	0.526	1.833728E-001	1.498212E-002
Pb-214	@	0.600	1.986834E-001	3.050102E-002
Ra-226	@	0.767	4.355957E-001	1.918996E-001

? = Nuclide is part of an undetermined solution
X = Nuclide rejected by the interference analysis
@ = Nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.000 sigma

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

Peak Locate Performed on: 6/1/2017 8:10:12 AM
Peak Locate From Channel: 100
Peak Locate To Channel: 8192

	Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty	Peak Type	Tol. Nuclide
m	3	92.65	1.0303E-002	15.00	Tol.	Yb-169 Th-234
	8	338.10	9.4265E-003	21.81	Tol.	Ra-223 Ac-228
	14	910.83	1.6240E-002	12.31	Tol.	Ac-228
	15	968.50	9.8684E-003	16.06	Tol.	Sb-124 Ac-228

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet

Errors quoted at 1.000 sigma