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*************************************************************************
*****        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-S003-0612-01.CNF

Report Generated On              : 6/2/2017    7:49:54 PM

Sample Title                     : NFB-A04-S003-0612-01
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                      :  9.365E+002 GWET

Sample Taken On                  : 5/11/2017   3:20:00 PM
Acquisition Started              : 6/2/2017    5:49:49 PM

Live Time                        :     7200.0 seconds
Real Time                        :     7202.4 seconds

Dead Time                        :   0.03 %


          Energy Calibration Used Done On       : 5/10/2017
          Efficiency Calibration Used Done On   : 12/14/2016
          Efficiency ID                         : ERT0101
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****
***** P E A K A N A L Y S I S R E P O R T *****
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Detector Name: ERT01
Sample Title: NFB-A04-S003-0612-01
Peak Analysis Performed on: 6/2/2017 7:49:55 PM
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
M	1	288-	315	300.27	74.93	1.00	2.71E+002	27.01	7.31E+002
m	2	288-	315	309.02	77.12	1.01	4.68E+002	31.99	7.65E+002
	3	345-	356	349.49	87.23	0.91	7.83E+001	44.77	7.62E+002
	4	366-	386	371.71	92.78	1.26	2.85E+002	67.45	1.17E+003
	5	737-	752	744.41	185.93	1.27	3.60E+002	49.50	6.95E+002
	6	831-	844	837.54	209.20	0.55	1.00E+002	40.18	5.50E+002
M	7	947-	979	954.72	238.49	1.08	1.47E+003	43.59	4.83E+002
m	8	947-	979	967.68	241.73	1.09	4.01E+002	25.62	3.68E+002
	9	1073-	1090	1081.39	270.15	0.83	2.00E+002	37.82	3.77E+002
	10	1106-	1113	1109.43	277.15	0.28	3.70E+001	21.42	2.09E+002
	11	1174-	1189	1180.87	295.01	1.17	6.97E+002	41.66	3.44E+002
	12	1189-	1206	1200.56	299.93	0.49	6.61E+001	37.29	4.06E+002
	13	1308-	1320	1312.38	327.87	1.28	8.01E+001	25.54	2.16E+002
	14	1347-	1359	1353.42	338.13	1.28	3.43E+002	31.02	2.36E+002
	15	1398-	1419	1407.62	351.68	1.27	1.28E+003	51.16	3.54E+002
	16	1845-	1861	1851.70	462.66	0.77	1.11E+002	25.03	1.64E+002
	17	1882-	1893	1886.97	471.48	0.52	1.95E+001	16.38	9.85E+001
	18	2031-	2055	2042.65	510.38	2.19	4.33E+002	38.24	2.48E+002
	19	2324-	2341	2332.04	582.71	1.26	6.25E+002	33.59	1.55E+002
	20	2427-	2446	2436.71	608.87	1.41	9.87E+002	39.00	1.53E+002
	21	2899-	2916	2908.51	726.78	1.15	1.64E+002	21.20	8.78E+001
	22	3066-	3078	3072.37	767.73	1.18	6.83E+001	17.13	8.57E+001
	23	3171-	3186	3179.01	794.38	1.18	6.70E+001	18.20	8.80E+001
	24	3336-	3349	3343.14	835.40	0.30	1.11E+001	14.50	7.09E+001
	25	3433-	3451	3441.73	860.04	0.85	7.78E+001	17.88	7.13E+001
	26	3635-	3654	3644.80	910.79	1.48	4.63E+002	27.69	8.69E+001
	27	3728-	3742	3736.08	933.60	0.40	7.18E+001	13.59	3.92E+001
M	28	3852-	3886	3858.50	964.20	1.42	8.99E+001	11.77	6.27E+001
m	29	3852-	3886	3874.94	968.31	1.42	2.82E+002	18.47	6.63E+001
	30	4472-	4490	4481.11	1119.80	1.94	2.36E+002	20.85	5.89E+001
	31	4614-	4627	4620.87	1154.73	0.83	3.18E+001	11.50	3.62E+001
	32	4944-	4959	4952.68	1237.66	0.82	7.55E+001	14.97	4.95E+001
	33	5504-	5518	5512.82	1377.65	0.75	4.59E+001	11.53	3.01E+001
	34	5832-	5855	5844.73	1460.60	1.55	6.09E+002	27.21	3.29E+001
	35	6915-	6928	6921.28	1729.65	0.89	3.48E+001	8.26	1.22E+001
	36	7051-	7071	7061.22	1764.62	2.06	1.90E+002	16.61	2.36E+001

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

Errors quoted at 1.000 sigma

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***** N U C L I D E M D A R E P O R T *****
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Detector Name: ERT01
Sample Geometry:
Sample Title: NFB-A04-S003-0612-01
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	4.0392E-001	4.04E-001	3.9496E+000
	Co-60	1173.23	99.85	4.4655E-002	4.47E-002	-2.4084E-002
		1332.49	99.98	4.7334E-002		5.9171E-003
>		2505.71	0.10	0.0000E+000		0.0000E+000
	Cs-137	32.06	5.54	3.1351E+003	5.23E-002	-4.6570E+002
		661.66	84.99	5.2251E-002		2.3884E-002
+	Tl-208	72.80	2.02	5.4179E+000	4.70E-002	1.1547E+000
		74.97*	3.41	1.9283E+000		2.8993E+000
		84.90	1.51	4.8314E+000		9.7380E-001
		277.36*	6.31	3.8195E-001		1.4373E-001
		510.77*	22.60	2.4966E-001		3.9475E-001
		583.19*	84.50	4.6980E-002		2.6783E-001
		763.13	1.81	2.9738E+000		-4.6815E-001
		860.56*	12.42	2.8878E-001		2.9914E-001
+	Bi-212	39.86	1.06	6.0174E+002	5.09E-001	-5.4383E+001
		727.33*	6.74	5.0947E-001		1.0296E+000
		785.37	1.11	4.2491E+000		2.8568E+000
		1620.74	1.51	3.3491E+000		1.0604E+000
		1806.00	0.09	4.1425E+001		2.1100E+001
+	Pb-212	74.81*	10.40	6.3227E-001	7.83E-002	9.5064E-001
		77.11*	17.50	3.5392E-001		8.9761E-001
		87.30*	7.81	6.7320E-001		2.5484E-001
		115.18	0.59	7.7533E+000		2.6164E-001
		238.63*	43.30	7.8333E-002		7.5709E-001
		300.09*	3.28	1.3418E+000		5.1596E-001
+	Bi-214	76.86*	0.43	1.4224E+001	8.92E-002	3.6074E+001
		89.81	0.24	2.7132E+001		2.8152E+000
		386.77	0.30	1.4544E+001		4.0930E+000
		454.77	0.29	1.4431E+001		4.1713E+000
		609.31*	45.49	8.9183E-002		7.9851E-001
		665.45	1.53	2.8803E+000		1.5579E+000
		703.11	0.48	9.1881E+000		-1.2521E-001
		719.86	0.39	1.1214E+001		-5.2019E+000
		768.36*	4.89	6.3677E-001		6.0002E-001
		786.10	0.31	1.4842E+001		5.5303E+000
		806.17	1.26	3.3102E+000		9.7745E-001
		934.06*	3.10	8.3776E-001		1.1539E+000
		964.08*	0.36	7.7166E+000		1.2662E+001
		1051.96	0.31	1.4636E+001		1.7084E-003
		1120.29*	14.91	2.6388E-001		9.1321E-001

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GWET)	Nuclide MDA (pCi/GWET)	Activity (pCi/GWET)
+	Bi-214	1133.66	0.25	1.9403E+001	8.92E-002	1.2472E+001
		1155.19*	1.63	1.7837E+000		1.1492E+000
		1207.68	0.45	1.1670E+001		-5.5128E+000
		1238.11*	5.79	6.4097E-001		8.1443E-001
		1280.96	1.43	3.5379E+000		-8.8785E-001
		1377.67*	4.00	7.8006E-001		7.7718E-001
		1385.31	0.76	6.4646E+000		-5.5488E+000
		1401.50	1.27	4.4786E+000		6.8523E-001
		1407.98	2.15	2.5651E+000		-7.6947E-001
		1509.23	2.11	2.4001E+000		3.5708E-001
		1538.50	0.38	1.1978E+001		3.8670E+000
		1543.32	0.20	2.3333E+001		3.8640E+000
		1583.22	0.69	8.0719E+000		5.0273E+000
		1594.73	0.25	2.3638E+001		-5.1536E+000
		1599.31	0.23	2.2327E+001		-2.8024E-001
		1661.28	1.15	4.1423E+000		3.6503E+000
		1683.99	0.22	1.6674E+001		-1.1486E+001
		1729.59*	2.92	7.7914E-001		9.1699E-001
		1764.49*	15.40	2.3849E-001		9.3027E-001
		1847.42	2.11	2.2130E+000		-4.1545E-001
		1873.16	0.22	1.7798E+001		1.8811E+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	3.0553E+001	1.26E-001	-8.9501E+000
		74.81*	6.44	9.9892E-001		1.5019E+000
		77.11*	10.80	5.6105E-001		1.4229E+000
		87.30*	4.84	1.0628E+000		4.0231E-001
		242.00*	7.43	3.8708E-001		1.2039E+000
		258.87	0.52	8.3142E+000		3.4990E+000
		274.80	0.47	9.8459E+000		3.9775E-001
		295.22*	19.30	1.9618E-001		8.9676E-001
		351.93*	37.60	1.2564E-001		9.2341E-001
		462.00*	0.22	1.5408E+001		1.5751E+001
		533.66	0.19	2.2250E+001		1.7795E+000
		785.96	1.07	4.2973E+000		1.6012E+000
		839.04	0.59	8.1927E+000		6.5277E+000
+	Ra-224	81.07	0.13	5.6829E+001	7.17E-001	-3.6277E+001
		83.78	0.22	3.2971E+001		-3.1686E-001
		240.99*	4.10	7.1701E-001		2.2301E+000
+	Ra-226	81.07	0.20	3.6970E+001	1.19E+000	-2.3600E+001
		83.78	0.33	2.1340E+001		-2.0509E-001
		94.90	0.15	3.9126E+001		-3.2063E+000
		186.21*	3.59	1.1936E+000		1.6884E+000
+	Ac-228	99.50	1.26	3.9676E+000	1.62E-001	1.7302E+000
		129.07	2.50	1.9769E+000		1.5137E+000
		209.25*	3.97	9.7845E-001		5.3445E-001
		270.24*	3.55	1.1308E+000		1.3622E+000
		328.00*	3.04	1.0054E+000		7.0662E-001
		338.32*	11.40	2.8308E-001		8.2120E-001
		409.46	2.02	2.0666E+000		7.3277E-001

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GWET)	Nuclide MDA (pCi/GWET)	Activity (pCi/GWET)
+	Ac-228	463.00*	4.45	7.8215E-001	1.62E-001	7.9957E-001
		755.31	1.03	4.3895E+000		1.5162E+000
		772.29	1.52	3.5723E+000		1.1246E-001
		794.94*	4.31	8.1814E-001		6.9939E-001
		835.70*	1.70	1.8791E+000		3.0530E-001
		911.20*	26.20	1.6192E-001		8.7245E-001
		964.79*	4.99	5.7378E-001		9.4153E-001
		968.96*	15.90	1.8556E-001		9.2857E-001
		1588.20	3.06	2.1175E+000		9.1802E-001
		1630.62	1.52	3.1769E+000		1.0223E+000
	Th-228	84.37	1.26	5.7711E+000	5.77E+000	7.2006E-001
		131.61	0.13	3.7172E+001		3.3333E+001
		166.41	0.10	4.5839E+001		6.6032E+000
		215.98	0.25	1.9030E+001		-1.0143E+001
	Pa-234m	258.23	0.07	5.8338E+001	5.41E+000	-2.9562E+001
		742.81	0.09	4.6507E+001		6.0108E+000
		766.36	0.32	1.6985E+001		1.5301E+001
		786.27	0.05	8.5818E+001		3.7077E+001
		1001.03	0.85	5.4060E+000		2.1784E+000
		1737.77	0.02	1.8682E+002		-3.2906E+001
	Th-234	63.30	3.75	4.1742E+000	1.46E+000	8.3913E-001
		92.59	4.33	1.4635E+000		1.8835E-001
		112.81	0.22	2.0937E+001		-1.2033E+000

+ = 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 *****
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Sample Title: NFB-A04-S003-0612-01
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	0.992	1460.82*		10.55	3.94960E+000	2.11545E-001
Tl-208	0.905	72.80	@	2.02		
		74.97*	@	3.41	2.89932E+000	3.01401E-001
		84.90	@	1.51		
		277.36*		6.31	1.43727E-001	8.34515E-002
		510.77*	@	22.60	3.94751E-001	5.95050E-002
		583.19*		84.50	2.67832E-001	1.68150E-002
		763.13	@	1.81		
		860.56*		12.42	2.99143E-001	6.91927E-002
Bi-211	0.935	351.03*		13.00	2.67586E+000	1.44479E-001
Bi-212	0.550	39.86	@	1.06		
		727.33*		6.74	1.02962E+000	1.36750E-001
		785.37		1.11		
		1620.74		1.51		
		1806.00	@	0.09		
Pb-212	0.984	74.81*		10.40	9.50642E-001	1.02559E-001
		77.11*		17.50	8.97606E-001	7.16443E-002
		87.30*		7.81	2.54844E-001	1.46143E-001
		115.18	@	0.59		
		238.63*		43.30	7.57091E-001	3.38103E-002
		300.09*		3.28	5.15956E-001	2.91526E-001
Bi-214	0.753	76.86*	@	0.43	3.60741E+001	2.90519E+000
		89.81	@	0.24		
		386.77	@	0.30		
		454.77	@	0.29		
		609.31*		45.49	7.98515E-001	3.93951E-002
		665.45	@	1.53		
		703.11	@	0.48		
		719.86	@	0.39		
		768.36*		4.89	6.00022E-001	1.51222E-001
		786.10	@	0.31		
		806.17	@	1.26		
		934.06*		3.10	1.15388E+000	2.20058E-001
		964.08*	@	0.36	1.26624E+001	1.73533E+000
		1051.96	@	0.31		
		1120.29*		14.91	9.13206E-001	8.36290E-002
		1133.66	@	0.25		
		1155.19*	@	1.63	1.14922E+000	4.16910E-001
		1207.68	@	0.45		
		1238.11*		5.79	8.14428E-001	1.63211E-001
		1280.96	@	1.43		

Nuclide Name	Id Confidence	Energy (keV)		Yield (%)	Activity (pCi/GWET)	Activity Uncertainty
Bi-214	0.753	1377.67*		4.00	7.77179E-001	1.96487E-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	9.16986E-001	2.19656E-001
		1764.49*		15.40	9.30267E-001	8.98916E-002
		1847.42	@	2.11		
		1873.16	@	0.22		
		2118.55	@	1.14		
		2204.21	@	5.08		
Pb-214	0.939	53.28	@	1.20		
		74.81*		6.44	1.50192E+000	1.63634E-001
		77.11*		10.80	1.42292E+000	1.18421E-001
		87.30*		4.84	4.02310E-001	2.30835E-001
		242.00*		7.43	1.20394E+000	8.76629E-002
		258.87	@	0.52		
		274.80	@	0.47		
		295.22*		19.30	8.96763E-001	6.16651E-002
		351.93*		37.60	9.23406E-001	4.89915E-002
		462.00*	@	0.22	1.57512E+001	3.65449E+000
		533.66	@	0.19		
		785.96	@	1.07		
		839.04	@	0.59		
Ra-224	0.809	81.07	@	0.13		
		83.78	@	0.22		
		240.99*		4.10	2.23011E+000	1.61300E-001
Ra-226	0.766	81.07	@	0.20		
		83.78	@	0.33		
		94.90	@	0.15		
		186.21*		3.59	1.68839E+000	2.77035E-001
Ac-228	0.742	99.50	@	1.26		
		129.07	@	2.50		
		209.25*		3.97	5.34447E-001	2.15413E-001
		270.24*		3.55	1.36219E+000	2.64374E-001
		328.00*		3.04	7.06620E-001	2.27990E-001
		338.32*		11.40	8.21199E-001	8.40313E-002
		409.46	@	2.02		
		463.00*		4.45	7.99574E-001	1.87654E-001
		755.31	@	1.03		
		772.29	@	1.52		
		794.94*		4.31	6.99393E-001	1.92234E-001
		835.70*	@	1.70	3.05299E-001	3.99013E-001

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/GWET)	Activity Uncertainty
Ac-228	0.742	911.20*	26.20	8.72446E-001	6.24818E-002
		964.79*	4.99	9.41534E-001	1.29266E-001
		968.96*	15.90	9.28569E-001	7.08398E-002
		1588.20	3.06		
		1630.62 @	1.52		

* = 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 *****
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	Nuclide Name		Nuclide Id Confidence	Wt mean Activity (pCi/GWET)	Wt mean Activity Uncertainty
	K-40		0.992	3.949603E+000	2.115454E-001
X	Mn-54		0.950		
X	Cd-109		0.902		
	Tl-208	@	0.905	2.632778E-001	1.588752E-002
	Bi-211		0.935	7.601747E-001	2.042726E-001
	Bi-212	@	0.550	1.029617E+000	1.367503E-001
	Pb-212	@	0.984	6.459217E-001	2.929008E-002
	Bi-214	@	0.753	8.279057E-001	3.091065E-002
	Pb-214	@	0.939	6.610789E-001	5.162814E-002
	Ra-224	@	0.809	1.005562E+000	1.855366E-001
	Ra-226	@	0.766	1.688393E+000	2.770348E-001
	Ac-228	@	0.742	8.661388E-001	3.350941E-002

? = 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: 6/2/2017 7:49:55 PM
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
4	92.78	2.9090E-002	32.33	Tol.	Yb-169 Th-234
17	471.48	2.7089E-003	83.98		

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

Errors quoted at 1.000 sigma