```
*********************************************************************
*****        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-HTC-A01-S003-1218-01.CNF

Report Generated On              : 6/9/2017    5:06:49 PM

Sample Title                     : HTC-A01-S003-1218-01
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                      :  1.090E+003 GWET

Sample Taken On                  : 5/13/2017  10:40:00 AM
Acquisition Started              : 6/9/2017    3:06:45 PM

Live Time                        :     7200.0 seconds
Real Time                        :     7201.8 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: HTC-A01-S003-1218-01
Peak Analysis Performed on: 6/9/2017 5:06:49 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	296-	314	299.98	74.86	0.75	9.84E+001	17.58	3.21E+002
m	2	296-	314	309.10	77.14	0.75	2.00E+002	21.93	3.54E+002
	3	365-	379	371.22	92.66	1.29	1.42E+002	39.53	4.91E+002
	4	738-	753	744.33	185.91	1.17	1.70E+002	36.04	3.74E+002
M	5	945-	977	954.81	238.51	1.04	6.05E+002	28.58	2.38E+002
m	6	945-	977	967.81	241.76	1.05	1.68E+002	17.52	2.33E+002
	7	1172-	1188	1180.81	294.99	1.17	2.99E+002	30.71	2.06E+002
	8	1341-	1359	1353.21	338.08	0.85	1.32E+002	27.88	1.91E+002
	9	1398-	1414	1407.85	351.73	1.18	5.41E+002	33.15	1.78E+002
	10	2033-	2052	2043.05	510.48	1.36	2.30E+002	26.71	1.38E+002
	11	2324-	2341	2332.37	582.79	1.04	2.19E+002	22.22	8.46E+001
	12	2426-	2446	2436.90	608.92	1.41	4.95E+002	29.42	1.02E+002
	13	2639-	2652	2646.43	661.28	1.53	4.58E+001	15.28	6.82E+001
	14	2904-	2915	2908.61	726.80	0.36	3.52E+001	12.88	5.18E+001
	15	3067-	3081	3073.88	768.11	0.43	3.79E+001	15.47	6.91E+001
	16	3635-	3655	3644.69	910.77	1.66	1.71E+002	19.61	5.89E+001
	17	3866-	3885	3876.31	968.65	1.10	9.25E+001	17.84	6.45E+001
	18	4473-	4489	4481.91	1120.00	1.50	9.68E+001	14.71	3.83E+001
	19	4945-	4959	4951.77	1237.43	1.03	5.35E+001	12.70	3.75E+001
	20	5273-	5284	5278.09	1318.98	0.50	1.70E+001	5.92	7.00E+000
	21	5504-	5519	5512.03	1377.45	1.12	4.80E+001	8.87	9.97E+000
	22	5833-	5857	5845.29	1460.74	1.80	9.63E+002	32.64	2.49E+001
	23	7052-	7070	7061.92	1764.80	1.62	1.09E+002	12.12	1.15E+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: HTC-A01-S003-1218-01
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	3.1435E-001	3.14E-001	5.4256E+000
	Co-60	1173.23	99.85	4.4317E-002	3.59E-002	2.3577E-002
		1332.49	99.98	3.5922E-002		4.4924E-004
>		2505.71	0.10	0.0000E+000		0.0000E+000
+	Cs-137	32.06	5.54	2.1838E+003	2.61E-002	9.2707E+001
		661.66*	84.99	2.6078E-002		1.7988E-002
+	Tl-208	72.80	2.02	3.4321E+000	3.05E-002	-1.3211E+000
		74.97*	3.41	1.1148E+000		9.1058E-001
		84.90	1.51	3.1164E+000		2.3545E+000
		277.36	6.31	4.9233E-001		7.2118E-002
		510.77*	22.60	1.6204E-001		7.8253E-002
		583.19*	84.50	3.0543E-002		7.9583E-002
		763.13	1.81	1.9929E+000		-6.2705E-001
		860.56	12.42	2.7494E-001		-1.4377E-001
+	Bi-212	39.86	1.06	3.8562E+002	3.02E-001	9.7841E+001
		727.33*	6.74	3.0248E-001		1.9055E-001
		785.37	1.11	3.0907E+000		-6.7066E-002
		1620.74	1.51	2.2131E+000		1.4378E+000
		1806.00	0.09	2.7199E+001		2.6977E+000
+	Pb-212	74.81*	10.40	3.6553E-001	4.86E-002	2.9857E-001
		77.11*	17.50	2.0930E-001		3.3182E-001
		87.30	7.81	5.8835E-001		4.7024E-001
		115.18	0.59	5.0981E+000		1.4956E+000
		238.63*	43.30	4.8630E-002		2.6326E-001
		300.09	3.28	9.9680E-001		5.7687E-002
+	Bi-214	76.86*	0.43	8.3694E+000	6.41E-002	1.3269E+001
		89.81	0.24	1.7898E+001		1.3153E+001
		386.77	0.30	9.8890E+000		2.8579E+000
		454.77	0.29	9.5448E+000		-4.6690E-001
		609.31*	45.49	6.4134E-002		3.4409E-001
		665.45	1.53	2.2604E+000		-2.1873E-001
		703.11	0.48	6.8184E+000		1.3432E+000
		719.86	0.39	8.3854E+000		3.2047E+000
		768.36*	4.89	5.1901E-001		2.8651E-001
		786.10	0.31	1.0693E+001		-5.6115E+000
		806.17	1.26	2.6122E+000		-8.5465E-001
		934.06	3.10	1.1166E+000		6.5390E-001
		964.08	0.36	1.3453E+001		6.6638E+000
		1051.96	0.31	1.2539E+001		8.0443E+000
		1120.29*	14.91	1.7815E-001		3.2174E-001

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GWET)	Nuclide MDA (pCi/GWET)	Activity (pCi/GWET)
+	Bi-214	1133.66	0.25	1.5985E+001	6.41E-002	2.3299E+000
		1155.19	1.63	2.5888E+000		1.8891E+000
		1207.68	0.45	9.6272E+000		-2.1896E+000
		1238.11*	5.79	4.7309E-001		4.9635E-001
		1280.96	1.43	2.8716E+000		1.6356E+000
		1377.67*	4.00	4.1354E-001		6.9888E-001
		1385.31	0.76	4.4856E+000		-1.0906E+000
		1401.50	1.27	2.9546E+000		-1.4167E+000
		1407.98	2.15	1.7106E+000		4.1432E-001
		1509.23	2.11	1.6563E+000		3.5154E-001
		1538.50	0.38	7.1043E+000		-8.1594E-001
		1543.32	0.20	1.3708E+001		3.6009E+000
		1583.22	0.69	4.9399E+000		1.2753E+000
		1594.73	0.25	1.4619E+001		-4.5147E+000
		1599.31	0.23	1.3400E+001		3.6493E+000
		1661.28	1.15	2.8339E+000		1.3284E+000
		1683.99	0.22	1.2089E+001		-5.7127E+000
		1729.59	2.92	1.1441E+000		7.0307E-002
		1764.49*	15.40	1.4750E-001		4.4595E-001
		1847.42	2.11	1.5983E+000		1.3812E+000
		1873.16	0.22	1.2469E+001		5.4664E+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	2.0780E+001	7.10E-002	2.0794E+000
		74.81*	6.44	5.7459E-001		4.6933E-001
		77.11*	10.80	3.3013E-001		5.2337E-001
		87.30	4.84	9.2413E-001		7.3862E-001
		242.00*	7.43	2.6599E-001		4.3260E-001
		258.87	0.52	5.7460E+000		1.0358E+000
		274.80	0.47	6.6078E+000		-2.9987E+000
		295.22*	19.30	1.3339E-001		3.3086E-001
		351.93*	37.60	7.1050E-002		3.3217E-001
		462.00	0.22	1.4196E+001		4.2713E+000
		533.66	0.19	1.5481E+001		-2.9407E-001
		785.96	1.07	3.0960E+000		-1.6247E+000
		839.04	0.59	5.8060E+000		2.9365E-001
+	Ra-224	81.07	0.13	3.6333E+001	4.95E-001	-3.1750E+001
		83.78	0.22	2.1080E+001		-2.1182E+001
		240.99*	4.10	4.9519E-001		8.0538E-001
+	Ra-226	81.07	0.20	2.3518E+001	7.68E-001	-2.0551E+001
		83.78	0.33	1.3575E+001		-1.3641E+001
		94.90	0.15	2.5408E+001		-1.9141E+000
		186.21*	3.59	7.6837E-001		5.6136E-001
	Ac-228	99.50	1.26	2.5903E+000	1.92E-001	-7.2698E-001
		129.07	2.50	1.2831E+000		2.5578E-001
		209.25	3.97	8.2070E-001		6.8561E-001
		270.24	3.55	9.2472E-001		4.1966E-001
		328.00	3.04	1.0293E+000		2.8665E-001
		338.32	11.40	3.1123E-001		2.4088E-001
		409.46	2.02	1.4497E+000		-3.4186E-001

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GWET)	Nuclide MDA (pCi/GWET)	Activity (pCi/GWET)
Ac-228	463.00	4.45	7.4622E-001	1.92E-001	5.4351E-001
	755.31	1.03	2.8904E+000		1.2038E-001
	772.29	1.52	2.4460E+000		6.4654E-002
	794.94	4.31	8.3406E-001		1.5572E-001
	835.70	1.70	2.0948E+000		1.0432E+000
	911.20	26.20	1.9179E-001		2.7828E-001
	964.79	4.99	1.0079E+000		5.2820E-001
	968.96	15.90	3.0941E-001		2.2683E-001
	1588.20	3.06	1.2825E+000		5.9917E-001
	1630.62	1.52	2.1239E+000		6.4715E-001
Th-228	84.37	1.26	3.7153E+000	3.72E+000	7.2057E-001
	131.61	0.13	2.4386E+001		9.9724E+000
	166.41	0.10	2.8676E+001		6.9751E+000
	215.98	0.25	1.2227E+001		1.0037E+000
Pa-234m	258.23	0.07	4.0905E+001	3.91E+000	1.4024E+001
	742.81	0.09	3.4615E+001		1.8432E+001
	766.36	0.32	1.1699E+001		1.1648E+001
	786.27	0.05	6.1293E+001		-4.0983E+001
	1001.03	0.85	3.9144E+000		-7.4078E-001
	1737.77	0.02	1.3209E+002		-2.1398E+002
Th-234	63.30	3.75	2.8191E+000	9.39E-001	2.6077E+000
	92.59	4.33	9.3935E-001		1.0207E+000
	112.81	0.22	1.3640E+001		-3.2625E+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 *****
****

Sample Title: HTC-A01-S003-1218-01
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	0.999	1460.82*		10.55	5.42556E+000	2.38627E-001
Cs-137	0.977	32.06	@	5.54		
		661.66*		84.99	1.79880E-002	6.02066E-003
Tl-208	0.699	72.80	@	2.02		
		74.97*	@	3.41	9.10582E-001	1.64973E-001
		84.90	@	1.51		
		277.36		6.31		
		510.77*	@	22.60	7.82534E-002	3.56354E-002
		583.19*		84.50	7.95831E-002	8.73326E-003
		763.13	@	1.81		
		860.56		12.42		
Bi-211	0.924	351.03*		13.00	9.62997E-001	6.93865E-002
Bi-212	0.553	39.86	@	1.06		
		727.33*		6.74	1.90554E-001	6.99836E-002
		785.37		1.11		
		1620.74		1.51		
		1806.00	@	0.09		
Pb-212	0.768	74.81*		10.40	2.98566E-001	5.47735E-002
		77.11*		17.50	3.31819E-001	3.87959E-002
		87.30		7.81		
		115.18	@	0.59		
		238.63*		43.30	2.63259E-001	1.56268E-002
		300.09		3.28		
Bi-214	0.663	76.86*	@	0.43	1.32685E+001	1.55785E+000
		89.81	@	0.24		
		386.77	@	0.30		
		454.77	@	0.29		
		609.31*		45.49	3.44093E-001	2.28413E-002
		665.45	@	1.53		
		703.11	@	0.48		
		719.86	@	0.39		
		768.36*		4.89	2.86514E-001	1.17087E-001
		786.10	@	0.31		
		806.17	@	1.26		
		934.06		3.10		
		964.08	@	0.36		
		1051.96	@	0.31		
		1120.29*		14.91	3.21745E-001	4.95383E-002
		1133.66	@	0.25		
		1155.19	@	1.63		
		1207.68	@	0.45		

Nuclide Name	Id Confidence	Energy (keV)		Yield (%)	Activity (pCi/GWET)	Activity Uncertainty
Bi-214	0.663	1238.11*		5.79	4.96351E-001	1.18688E-001
		1280.96	@	1.43		
		1377.67*		4.00	6.98885E-001	1.30625E-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	4.45945E-001	5.49994E-002
		1847.42	@	2.11		
		1873.16	@	0.22		
		2118.55	@	1.14		
		2204.21	@	5.08		
Pb-214	0.847	53.28	@	1.20		
		74.81*		6.44	4.69333E-001	8.63968E-002
		77.11*		10.80	5.23369E-001	6.24226E-002
		87.30		4.84		
		242.00*		7.43	4.32601E-001	4.76760E-002
		258.87	@	0.52		
		274.80	@	0.47		
		295.22*		19.30	3.30857E-001	3.57621E-002
		351.93*		37.60	3.32174E-001	2.37014E-002
		462.00	@	0.22		
		533.66	@	0.19		
		785.96	@	1.07		
		839.04	@	0.59		
Ra-224	0.802	81.07	@	0.13		
		83.78	@	0.22		
		240.99*		4.10	8.05378E-001	8.85010E-002
Ra-226	0.764	81.07	@	0.20		
		83.78	@	0.33		
		94.90	@	0.15		
		186.21*		3.59	5.61365E-001	1.71468E-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		0.999	5.425562E+000	2.386272E-001
Cs-137	@	0.977	1.798804E-002	6.020660E-003
Tl-208	@	0.699	7.850008E-002	8.697971E-003
Bi-211		0.924	2.322643E-001	1.098874E-001
Bi-212	@	0.553	1.905539E-001	6.998363E-002
Pb-212	@	0.768	2.399229E-001	1.431624E-002
Bi-214	@	0.663	3.619206E-001	1.866742E-002
Pb-214	@	0.847	2.520572E-001	2.979040E-002
Ra-224	@	0.802	3.361205E-001	1.039802E-001
Ra-226	@	0.764	5.613647E-001	1.714680E-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: 6/9/2017 5:06:49 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
3	92.66	9.2028E-003	60.33	Tol.	Yb-169 Th-234
8	338.08	1.8335E-002	21.12	Tol.	Ra-223 Ac-228
16	910.77	2.3020E-002	11.89	Tol.	Ac-228
17	968.65	1.2841E-002	19.30	Sum	
20	1318.98	2.3611E-003	34.84		

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

Errors quoted at 1.000 sigma