```
*************************************************************************
*****        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-S003-0006-01.CNF

Report Generated On              : 6/9/2017    1:00:20 PM

Sample Title                     : HTC-A01-S003-0006-01
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                      :  1.010E+003 GWET

Sample Taken On                  : 5/13/2017  10:44:00 AM
Acquisition Started              : 6/9/2017   11:00:16 AM

Live Time                        :     7200.0 seconds
Real Time                        :     7201.7 seconds

Dead Time                        :   0.02 %


            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-S003-0006-01
Peak Analysis Performed on: 6/9/2017 1:00:20 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-	315	299.91	74.84	0.88	1.26E+002	18.68	3.05E+002
m	2	296-	315	309.07	77.13	0.88	1.60E+002	20.00	3.49E+002
	3	366-	382	371.45	92.72	0.95	1.66E+002	40.51	4.67E+002
	4	612-	620	616.03	153.84	0.68	4.45E+001	21.39	1.92E+002
	5	735-	756	743.56	185.72	1.32	2.34E+002	41.04	3.85E+002
	6	757-	765	761.00	190.07	0.38	1.01E+001	19.11	1.66E+002
	7	832-	843	836.26	208.88	0.51	3.11E+001	24.37	2.23E+002
M	8	946-	979	954.65	238.47	1.11	6.08E+002	28.46	2.24E+002
m	9	946-	979	966.97	241.55	1.11	1.66E+002	16.88	1.92E+002
	10	1175-	1187	1180.98	295.03	0.89	2.05E+002	25.72	1.73E+002
	11	1347-	1360	1352.78	337.97	0.92	1.16E+002	20.81	1.15E+002
	12	1399-	1413	1407.29	351.60	1.18	4.10E+002	27.70	1.25E+002
	13	2030-	2053	2041.28	510.04	0.82	2.27E+002	28.36	1.44E+002
	14	2325-	2339	2332.05	582.71	1.14	2.16E+002	21.47	8.35E+001
	15	2427-	2446	2436.39	608.79	1.32	4.24E+002	26.02	7.24E+001
	16	2636-	2650	2644.32	660.75	1.08	5.09E+001	14.42	5.41E+001
	17	2902-	2918	2908.55	726.79	0.80	7.50E+001	14.15	4.00E+001
	18	3436-	3448	3442.61	860.26	0.34	2.79E+001	12.05	4.41E+001
	19	3636-	3654	3643.88	910.56	0.97	1.92E+002	16.28	2.22E+001
	20	3866-	3884	3875.40	968.42	1.50	8.59E+001	16.68	5.61E+001
	21	4472-	4491	4481.39	1119.87	1.22	1.04E+002	17.41	5.58E+001
	22	5831-	5858	5844.70	1460.59	1.51	8.76E+002	32.15	3.50E+001
	23	7053-	7071	7061.95	1764.81	0.54	7.10E+001	11.63	1.90E+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-S003-0006-01
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	4.0402E-001	4.04E-001	5.3169E+000
	Co-60	1173.23	99.85	4.3810E-002	3.62E-002	-1.5525E-003
		1332.49	99.98	3.6214E-002		-8.9014E-003
>		2505.71	0.10	0.0000E+000		0.0000E+000
+	Cs-137	32.06	5.54	2.1487E+003	2.58E-002	9.5945E+002
		661.66*	84.99	2.5833E-002		2.1562E-002
+	Tl-208	72.80	2.02	3.5329E+000	3.12E-002	-2.6393E+000
		74.97*	3.41	1.1748E+000		1.2588E+000
		84.90	1.51	3.0522E+000		1.2418E+000
		277.36	6.31	4.7586E-001		1.2536E-001
		510.77*	22.60	1.8605E-001		7.9612E-002
		583.19*	84.50	3.1238E-002		8.4662E-002
		763.13	1.81	2.0478E+000		1.0136E+000
		860.56*	12.42	1.9040E-001		1.0012E-001
+	Bi-212	39.86	1.06	3.8669E+002	3.20E-001	3.7740E+000
		727.33*	6.74	3.1983E-001		4.3860E-001
		785.37	1.11	2.8904E+000		1.9752E-001
		1620.74	1.51	2.1153E+000		-2.3162E+000
		1806.00	0.09	2.9881E+001		2.4576E+000
+	Pb-212	74.81*	10.40	3.8520E-001	5.11E-002	4.1274E-001
		77.11*	17.50	2.2428E-001		2.8631E-001
		87.30	7.81	5.7029E-001		4.3498E-002
		115.18	0.59	4.9548E+000		-4.9636E-001
		238.63*	43.30	5.1119E-002		2.8539E-001
		300.09	3.28	9.6925E-001		-8.8158E-001
+	Bi-214	76.86*	0.43	8.9700E+000	5.76E-002	1.1451E+001
		89.81	0.24	1.7765E+001		7.5922E-001
		386.77	0.30	9.5061E+000		-3.3416E+000
		454.77	0.29	9.9680E+000		-1.3586E-002
		609.31*	45.49	5.7576E-002		3.1783E-001
		665.45	1.53	2.2376E+000		-2.5999E-001
		703.11	0.48	6.6974E+000		-2.5961E+000
		719.86	0.39	7.4736E+000		-1.3112E+000
		768.36	4.89	7.5879E-001		4.7724E-001
		786.10	0.31	9.9340E+000		-4.6614E+000
		806.17	1.26	2.6525E+000		6.2751E-001
		934.06	3.10	1.1798E+000		4.2085E-001
		964.08	0.36	1.3877E+001		4.9544E+000
		1051.96	0.31	1.2215E+001		-9.2462E-001
		1120.29*	14.91	2.4531E-001		3.7410E-001

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GWET)	Nuclide MDA (pCi/GWET)	Activity (pCi/GWET)
+	Bi-214	1133.66	0.25	1.5838E+001	5.76E-002	-1.0741E+001
		1155.19	1.63	2.5580E+000		1.8561E+000
		1207.68	0.45	1.0005E+001		5.1484E+000
		1238.11	5.79	8.5505E-001		-8.4468E-003
		1280.96	1.43	2.8223E+000		-9.0939E-001
		1377.67	4.00	9.4831E-001		-2.3942E-001
		1385.31	0.76	4.7083E+000		-4.8409E+000
		1401.50	1.27	2.7482E+000		-9.9928E-001
		1407.98	2.15	1.6881E+000		3.8673E-001
		1509.23	2.11	1.7225E+000		6.5592E-001
		1538.50	0.38	7.9511E+000		1.1565E+000
		1543.32	0.20	1.5485E+001		-1.6697E+000
		1583.22	0.69	5.8898E+000		1.6891E+000
		1594.73	0.25	1.7029E+001		-2.7589E+000
		1599.31	0.23	1.4879E+001		-6.9453E+000
		1661.28	1.15	2.9152E+000		2.4983E-001
		1683.99	0.22	1.4309E+001		6.1367E+000
		1729.59	2.92	1.0938E+000		6.5283E-001
		1764.49*	15.40	1.9596E-001		3.0643E-001
		1847.42	2.11	1.5593E+000		9.2023E-001
		1873.16	0.22	1.4012E+001		-6.6923E-001
>		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	2.0793E+001	6.22E-002	8.4657E+000
		74.81*	6.44	6.0562E-001		6.4892E-001
		77.11*	10.80	3.5382E-001		4.5167E-001
		87.30	4.84	8.9592E-001		6.8335E-002
		242.00*	7.43	2.6099E-001		4.6216E-001
		258.87	0.52	5.6313E+000		-9.2187E-002
		274.80	0.47	6.2286E+000		-6.4678E+000
		295.22*	19.30	1.2179E-001		2.4390E-001
		351.93*	37.60	6.2155E-002		2.7070E-001
		462.00	0.22	1.4385E+001		9.5426E+000
		533.66	0.19	1.5511E+001		6.1157E+000
		785.96	1.07	2.8763E+000		-1.3497E+000
		839.04	0.59	6.1323E+000		-7.0361E-001
+	Ra-224	81.07	0.13	3.7239E+001	4.86E-001	-2.1429E+001
		83.78	0.22	2.1122E+001		-1.3287E+001
		240.99*	4.10	4.8581E-001		8.6026E-001
+	Ra-226	81.07	0.20	2.4109E+001	9.31E-001	-1.3873E+001
		83.78	0.33	1.3605E+001		-8.5582E+000
		94.90	0.15	2.5584E+001		-3.3304E-001
		186.21*	3.59	9.3072E-001		9.3038E-001
	Ac-228	99.50	1.26	2.5358E+000	1.99E-001	-5.5050E-001
		129.07	2.50	1.2943E+000		8.7631E-001
		209.25	3.97	8.1133E-001		2.7057E-001
		270.24	3.55	9.0304E-001		8.9778E-001
		328.00	3.04	1.0208E+000		-6.4705E-001
		338.32	11.40	3.0823E-001		4.8897E-002
		409.46	2.02	1.4969E+000		-3.4739E-001

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GWET)	Nuclide MDA (pCi/GWET)	Activity (pCi/GWET)
Ac-228	463.00	4.45	7.3877E-001	1.99E-001	-1.8084E-001
	755.31	1.03	3.3424E+000		-6.7120E-001
	772.29	1.52	2.4599E+000		5.7820E-002
	794.94	4.31	8.2885E-001		1.0892E-001
	835.70	1.70	2.1193E+000		-1.0923E+000
	911.20	26.20	1.9863E-001		2.5903E-001
	964.79	4.99	1.0376E+000		5.0944E-001
	968.96	15.90	3.2294E-001		3.4675E-001
	1588.20	3.06	1.5239E+000		8.1681E-001
	1630.62	1.52	2.4407E+000		1.4627E-001
Th-228	84.37	1.26	3.6801E+000	3.68E+000	8.2378E-001
	131.61	0.13	2.4577E+001		1.4649E+001
	166.41	0.10	2.8963E+001		1.3789E+001
	215.98	0.25	1.2267E+001		9.6111E-001
Pa-234m	258.23	0.07	4.0121E+001	4.15E+000	-9.8648E+000
	742.81	0.09	3.2995E+001		-1.8293E+001
	766.36	0.32	1.1475E+001		5.3700E+000
	786.27	0.05	5.7662E+001		-5.5670E-001
	1001.03	0.85	4.1523E+000		-5.9960E+000
	1737.77	0.02	1.2516E+002		-2.8329E+002
Th-234	63.30	3.75	2.7925E+000	9.69E-001	5.6286E-001
	92.59	4.33	9.6914E-001		8.5885E-002
	112.81	0.22	1.3091E+001		-8.0831E+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-S003-0006-01
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	0.991	1460.82*		10.55	5.31694E+000	2.46357E-001
Cs-137	0.882	32.06	@	5.54		
		661.66*		84.99	2.15619E-002	6.13776E-003
Tl-208	0.808	72.80	@	2.02		
		74.97*	@	3.41	1.25880E+000	1.90444E-001
		84.90	@	1.51		
		277.36		6.31		
		510.77*	@	22.60	7.96122E-002	4.06710E-002
		583.19*		84.50	8.46616E-002	9.11996E-003
		763.13	@	1.81		
		860.56*		12.42	1.00125E-001	4.32995E-002
Bi-211	0.950	351.03*		13.00	7.84770E-001	6.11865E-002
Bi-212	0.551	39.86	@	1.06		
		727.33*		6.74	4.38603E-001	8.38085E-002
		785.37		1.11		
		1620.74		1.51		
		1806.00	@	0.09		
Pb-212	0.767	74.81*		10.40	4.12740E-001	6.35685E-002
		77.11*		17.50	2.86310E-001	3.76219E-002
		87.30		7.81		
		115.18	@	0.59		
		238.63*		43.30	2.85395E-001	1.68316E-002
		300.09		3.28		
Bi-214	0.478	76.86*	@	0.43	1.14507E+001	1.50965E+000
		89.81	@	0.24		
		386.77	@	0.30		
		454.77	@	0.29		
		609.31*		45.49	3.17827E-001	2.16610E-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	3.74100E-001	6.31866E-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	0.478	1238.11		5.79		
		1280.96	@	1.43		
		1377.67		4.00		
		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	3.06428E-001	5.56687E-002
		1847.42	@	2.11		
		1873.16	@	0.22		
		2118.55	@	1.14		
		2204.21	@	5.08		
Pb-214	0.841	53.28	@	1.20		
		74.81*		6.44	6.48921E-001	1.00430E-001
		77.11*		10.80	4.51667E-001	6.02973E-002
		87.30		4.84		
		242.00*		7.43	4.62159E-001	4.96907E-002
		258.87	@	0.52		
		274.80	@	0.47		
		295.22*		19.30	2.43897E-001	3.17781E-002
		351.93*		37.60	2.70701E-001	2.09307E-002
		462.00	@	0.22		
		533.66	@	0.19		
		785.96	@	1.07		
		839.04	@	0.59		
Ra-224	0.841	81.07	@	0.13		
		83.78	@	0.22		
		240.99*		4.10	8.60257E-001	9.22114E-002
Ra-226	0.744	81.07	@	0.20		
		83.78	@	0.33		
		94.90	@	0.15		
		186.21*		3.59	9.30378E-001	2.11151E-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		0.991	5.316941E+000	2.463570E-001
Cs-137	@	0.882	2.156187E-002	6.137755E-003
Tl-208	@	0.808	8.530626E-002	8.890095E-003
Bi-211		0.950	2.251593E-001	1.001079E-001
Bi-212	@	0.551	4.386027E-001	8.380854E-002
Pb-212	@	0.767	2.632976E-001	1.519776E-002
Bi-214	@	0.478	3.209250E-001	1.919354E-002
Pb-214	@	0.841	1.930335E-001	2.761560E-002
Ra-224	@	0.841	5.009466E-001	1.050485E-001
Ra-226	@	0.744	9.303777E-001	2.111515E-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 1:00:20 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	92.72	1.2509E-002	45.46	Tol.	Yb-169 Th-234
4	153.84	6.1810E-003	48.06	Sum	
6	190.07	1.4037E-003	189.05	Tol.	Pm-148x
7	208.88	4.3132E-003	78.48	Tol.	Lu-177 Ac-228 Np-239
11	337.97	1.6143E-002	17.90	Tol.	Ra-223 Ac-228
19	910.56	2.5902E-002	8.80	Tol.	Ac-228
20	968.42	1.1925E-002	19.42	Sum	

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

Errors quoted at 1.000 sigma