```
*************************************************************************
*****        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-A03-S001-0006-02.CNF

Report Generated On              : 7/2/2017    2:40:56 PM

Sample Title                     : HTC-A03-S001-0006-02
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                      :  7.845E+002 GWET

Sample Taken On                  : 5/15/2017   8:26:00 AM
Acquisition Started              : 7/2/2017   12:40:52 PM

Live Time                        :     7200.0 seconds
Real Time                        :     7201.9 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 *****
****

Detector Name: ERT01
Sample Title: HTC-A03-S001-0006-02
Peak Analysis Performed on: 7/2/2017 2:40:56 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	295-	316	300.27	74.93	0.87	2.16E+002	22.84	4.41E+002
m	2	295-	316	309.05	77.12	0.88	3.42E+002	26.82	5.05E+002
	3	343-	355	350.03	87.37	0.60	1.20E+002	40.46	5.72E+002
	4	365-	387	372.04	92.87	0.94	1.15E+002	61.58	9.42E+002
	5	510-	524	517.50	129.22	0.78	6.98E+001	38.90	5.00E+002
	6	589-	597	592.59	147.99	0.67	1.56E+001	25.55	2.97E+002
	7	736-	751	744.92	186.06	1.35	2.43E+002	38.81	4.20E+002
	8	832-	847	837.66	209.23	1.13	1.35E+002	36.00	3.84E+002
	9	947-	961	955.17	238.60	1.07	1.04E+003	49.40	4.88E+002
	10	1103-	1113	1109.91	277.27	0.33	1.28E+001	21.82	1.94E+002
	11	1173-	1188	1181.10	295.07	1.14	3.72E+002	32.97	2.38E+002
	12	1195-	1206	1201.47	300.16	0.39	5.50E+001	21.80	1.68E+002
	13	1345-	1359	1354.02	338.28	0.98	2.29E+002	28.01	1.93E+002
	14	1400-	1423	1408.15	351.81	1.07	5.97E+002	39.45	2.35E+002
	15	1844-	1859	1853.35	463.07	1.04	9.06E+001	20.16	1.04E+002
	16	2031-	2059	2043.75	510.66	1.64	3.25E+002	34.69	1.89E+002
	17	2326-	2344	2333.09	582.97	1.13	4.56E+002	29.29	1.18E+002
	18	2431-	2447	2437.79	609.14	1.36	4.68E+002	28.63	1.12E+002
	19	2639-	2653	2646.75	661.36	0.40	7.24E+001	16.82	7.16E+001
	20	2902-	2917	2909.75	727.09	1.10	7.07E+001	18.84	9.43E+001
	21	3137-	3147	3142.29	785.20	0.66	8.50E+000	12.35	6.05E+001
	22	3174-	3188	3180.33	794.71	0.64	4.78E+001	12.91	4.13E+001
	23	3435-	3449	3442.53	860.24	1.44	6.76E+001	14.14	4.54E+001
	24	3633-	3656	3646.02	911.10	1.65	3.30E+002	25.30	7.75E+001
M	25	3853-	3886	3860.92	964.80	1.54	6.18E+001	10.25	5.95E+001
m	26	3853-	3886	3877.16	968.86	1.55	2.02E+002	15.86	5.69E+001
	27	4474-	4492	4483.58	1120.42	1.37	8.12E+001	19.43	8.78E+001
	28	5836-	5860	5847.48	1461.28	1.68	1.70E+003	43.92	5.86E+001
	29	7055-	7074	7065.24	1765.63	1.24	1.10E+002	12.44	1.26E+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-A03-S001-0006-02
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	6.1419E-001	6.14E-001	1.3390E+001
	Co-60	1173.23	99.85	7.1913E-002	5.68E-002	-3.0243E-003
		1332.49	99.98	5.6783E-002		-2.8234E-002
>		2505.71	0.10	0.0000E+000		0.0000E+000
+	Cs-137	32.06	5.54	3.3059E+003	3.83E-002	2.3626E+003
		661.66*	84.99	3.8346E-002		3.9562E-002
+	Tl-208	72.80	2.02	5.5422E+000	5.18E-002	-1.3485E+000
		74.97*	3.41	1.8426E+000		2.8299E+000
		84.90	1.51	4.9322E+000		-2.2845E-001
		277.36*	6.31	4.8979E-001		6.1211E-002
		510.77*	22.60	2.8692E-001		2.8534E-001
		583.19*	84.50	5.1796E-002		2.3835E-001
		763.13	1.81	3.0452E+000		-1.8398E+000
		860.56*	12.42	2.6487E-001		3.1847E-001
+	Bi-212	39.86	1.06	6.1074E+002	6.23E-001	3.0624E+002
		727.33*	6.74	6.2308E-001		5.4326E-001
		785.37*	1.11	2.8831E+000		4.1883E-001
		1620.74	1.51	2.8123E+000		-1.2778E-001
		1806.00	0.09	4.0651E+001		-9.0188E+000
+	Pb-212	74.81*	10.40	6.0415E-001	1.15E-001	9.2788E-001
		77.11*	17.50	3.5329E-001		8.0255E-001
		87.30*	7.81	7.3111E-001		4.7767E-001
		115.18	0.59	7.6731E+000		-7.5244E-001
		238.63*	43.30	1.1482E-001		6.4930E-001
		300.09*	3.28	9.3761E-001		5.2554E-001
	Bi-214	76.86	0.43	2.4603E+001	1.75E-001	1.9191E+000
		89.81	0.24	2.7746E+001		8.7300E+000
		386.77	0.30	1.3948E+001		-1.0960E+000
		454.77	0.29	1.4611E+001		2.9702E+000
		609.31	45.49	1.7545E-001		4.8829E-001
		665.45	1.53	3.3966E+000		-1.2459E+000
		703.11	0.48	9.9579E+000		7.0977E+000
		719.86	0.39	1.2340E+001		2.6349E+000
		768.36	4.89	1.0836E+000		3.9302E-002
		786.10	0.31	1.7540E+001		5.1575E+000
		806.17	1.26	3.8912E+000		-4.1639E-001
		934.06	3.10	1.7171E+000		4.0790E-001
		964.08	0.36	2.3000E+001		-2.8915E+000
		1051.96	0.31	1.8750E+001		-1.5436E+001
		1120.29	14.91	5.4740E-001		4.6088E-001

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GWET)	Nuclide MDA (pCi/GWET)	Activity (pCi/GWET)
	Bi-214	1133.66	0.25	2.6083E+001	1.75E-001	1.5815E+001
		1155.19	1.63	4.4340E+000		5.2798E+000
		1207.68	0.45	1.4630E+001		-1.2506E+001
		1238.11	5.79	1.3620E+000		-5.2612E-001
		1280.96	1.43	4.3583E+000		1.1131E+000
		1377.67	4.00	1.4098E+000		8.5405E-001
		1385.31	0.76	6.8277E+000		-5.5199E+000
		1401.50	1.27	4.1038E+000		-2.7650E+000
		1407.98	2.15	2.6628E+000		2.1089E+000
		1509.23	2.11	2.4886E+000		2.0949E+000
		1538.50	0.38	1.1582E+001		1.0361E+001
		1543.32	0.20	2.2960E+001		1.6277E+001
		1583.22	0.69	8.1461E+000		6.1129E+000
		1594.73	0.25	2.1528E+001		2.0132E+001
		1599.31	0.23	1.9153E+001		1.5450E+001
		1661.28	1.15	3.7147E+000		8.4064E-001
		1683.99	0.22	1.8195E+001		-4.2404E+000
		1729.59	2.92	1.5605E+000		1.1545E+000
		1764.49	15.40	4.7799E-001		6.5086E-001
		1847.42	2.11	2.1164E+000		5.5352E-002
		1873.16	0.22	1.9605E+001		-1.1763E+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	3.0672E+001	1.28E-001	-1.3941E+001
		74.81*	6.44	9.3013E-001		1.4285E+000
		77.11*	10.80	5.4576E-001		1.2398E+000
		87.30*	4.84	1.1247E+000		7.3484E-001
		242.00	7.43	1.0499E+000		-2.3115E-002
		258.87	0.52	8.5792E+000		8.5476E+000
		274.80	0.47	9.9682E+000		-9.1210E+000
		295.22*	19.30	1.9500E-001		5.7066E-001
		351.93*	37.60	1.2788E-001		5.0957E-001
		462.00	0.22	2.1420E+001		2.0533E+001
		533.66	0.19	2.2841E+001		-1.1519E+001
		785.96*	1.07	2.8513E+000		4.1422E-001
		839.04	0.59	9.5198E+000		6.1760E+000
	Ra-224	81.07	0.13	5.8452E+001	2.05E+000	3.6731E-001
		83.78	0.22	3.3084E+001		-1.3120E-001
		240.99	4.10	2.0472E+000		2.7932E-001
+	Ra-226	81.07	0.20	3.7056E+001	1.12E+000	2.3286E-001
		83.78	0.33	2.0867E+001		-8.2749E-002
		94.90	0.15	3.9106E+001		-3.1471E+000
		186.21*	3.59	1.1247E+000		1.2543E+000
+	Ac-228	99.50	1.26	4.0439E+000	2.00E-001	2.7920E-001
		129.07*	2.50	1.6149E+000		6.2876E-001
		209.25*	3.97	1.0517E+000		8.8382E-001
		270.24	3.55	1.4258E+000		6.5651E-001
		328.00	3.04	1.5554E+000		-4.5503E-002
		338.32*	11.40	3.2907E-001		6.7073E-001
		409.46	2.02	2.3818E+000		5.1475E-001

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GWET)	Nuclide MDA (pCi/GWET)	Activity (pCi/GWET)
+	Ac-228	463.00*	4.45	7.5533E-001	2.00E-001	8.0183E-001
		755.31	1.03	5.2997E+000		2.6080E+000
		772.29	1.52	3.7489E+000		2.7821E+000
		794.94*	4.31	6.8417E-001		6.1141E-001
		835.70	1.70	3.4939E+000		-1.6961E+000
		911.20*	26.20	2.0038E-001		7.5990E-001
		964.79*	4.99	6.8596E-001		7.9328E-001
		968.96*	15.90	2.1156E-001		8.1582E-001
		1588.20	3.06	2.0340E+000		2.0448E+000
		1630.62	1.52	3.1811E+000		-1.2036E+000
	Th-228	84.37	1.26	5.8623E+000	5.86E+000	-4.7098E-002
		131.61	0.13	3.7174E+001		6.3459E+000
		166.41	0.10	4.3749E+001		4.8762E+000
		215.98	0.25	1.8538E+001		-2.2327E+000
	Pa-234m	258.23	0.07	6.0077E+001	6.04E+000	4.4528E+000
		742.81	0.09	5.3669E+001		7.0089E+000
		766.36	0.32	1.6657E+001		-9.3207E-001
		786.27	0.05	1.0079E+002		2.8277E+001
		1001.03	0.85	6.0394E+000		-1.5962E+000
		1737.77	0.02	2.0113E+002		-1.4246E+001
	Th-234	63.30	3.75	4.3021E+000	1.47E+000	1.1654E+000
		92.59	4.33	1.4691E+000		6.4505E-001
		112.81	0.22	2.0666E+001		-7.4302E+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-A03-S001-0006-02
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	0.966	1460.82*		10.55	1.33896E+001	5.05014E-001
Cs-137	0.985	32.06	@	5.54		
		661.66*		84.99	3.95624E-002	9.25554E-003
Tl-208	0.930	72.80	@	2.02		
		74.97*	@	3.41	2.82990E+000	3.10806E-001
		84.90	@	1.51		
		277.36*		6.31	6.12113E-002	1.03989E-001
		510.77*	@	22.60	2.85336E-001	6.54518E-002
		583.19*		84.50	2.38352E-001	1.72917E-002
		763.13	@	1.81		
		860.56*		12.42	3.18472E-001	6.70872E-002
Bi-211	0.907	351.03*		13.00	1.47996E+000	1.12758E-001
Bi-212	0.763	39.86	@	1.06		
		727.33*		6.74	5.43261E-001	1.45721E-001
		785.37*		1.11	4.18827E-001	6.08595E-001
		1620.74		1.51		
		1806.00	@	0.09		
Pb-212	0.986	74.81*		10.40	9.27881E-001	1.05365E-001
		77.11*		17.50	8.02551E-001	7.11491E-002
		87.30*		7.81	4.77675E-001	1.62164E-001
		115.18	@	0.59		
		238.63*		43.30	6.49304E-001	3.82601E-002
		300.09*		3.28	5.25541E-001	2.09240E-001
Pb-214	0.809	53.28	@	1.20		
		74.81*		6.44	1.42854E+000	1.63665E-001
		77.11*		10.80	1.23977E+000	1.13727E-001
		87.30*		4.84	7.34837E-001	2.49855E-001
		242.00		7.43		
		258.87	@	0.52		
		274.80	@	0.47		
		295.22*		19.30	5.70664E-001	5.42005E-002
		351.93*		37.60	5.09575E-001	3.84869E-002
		462.00	@	0.22		
		533.66	@	0.19		
		785.96*	@	1.07	4.14216E-001	6.02679E-001
		839.04	@	0.59		
Ra-226	0.773	81.07	@	0.20		
		83.78	@	0.33		
		94.90	@	0.15		
		186.21*		3.59	1.25433E+000	2.58164E-001
Ac-228	0.662	99.50	@	1.26		

Nuclide Name	Id Confidence	Energy (keV)		Yield (%)	Activity (pCi/GWET)	Activity Uncertainty
Ac-228	0.662	129.07*	@	2.50	6.28760E-001	3.50980E-001
		209.25*		3.97	8.83818E-001	2.38302E-001
		270.24		3.55		
		328.00		3.04		
		338.32*		11.40	6.70730E-001	8.81725E-002
		409.46	@	2.02		
		463.00*		4.45	8.01832E-001	1.85454E-001
		755.31	@	1.03		
		772.29	@	1.52		
		794.94*		4.31	6.11414E-001	1.67171E-001
		835.70	@	1.70		
		911.20*		26.20	7.59903E-001	6.59959E-002
		964.79*		4.99	7.93282E-001	1.35537E-001
		968.96*		15.90	8.15818E-001	7.15322E-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		0.966	1.338961E+001	5.050141E-001
X	Cd-109		0.931		
	Cs-137	@	0.985	3.956242E-002	9.255535E-003
	Tl-208	@	0.930	2.383010E-001	1.641191E-002
	Bi-211		0.907	7.014037E-002	1.763828E-001
	Bi-212	@	0.763	5.100380E-001	1.414431E-001
	Pb-212	@	0.986	5.861792E-001	3.208466E-002
	Pb-214	@	0.809	4.854243E-001	4.729101E-002
	Ra-226	@	0.773	1.254328E+000	2.581641E-001
	Ac-228	@	0.662	7.589793E-001	3.805390E-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: 7/2/2017 2:40:56 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	92.87	5.3618E-003	160.26	Tol.	Yb-169 Th-234
6	147.99	2.1722E-003	163.39		
18	609.14	6.4950E-002	6.12	Tol.	Bi-214
27	1120.42	1.1284E-002	23.92	Sum	
29	1765.63	1.4601E-002	11.91		

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

Errors quoted at 1.000 sigma