```
*************************************************************************
*****        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-S005-2430-01.CNF

Report Generated On              : 6/13/2017   3:40:55 PM

Sample Title                     : HTC-A01-S005-2430-01
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                      :  8.088E+002 GWET

Sample Taken On                  : 5/13/2017   9:49:00 AM
Acquisition Started              : 6/13/2017   1:40:51 PM

Live Time                        :     7200.0 seconds
Real Time                        :     7202.1 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-A01-S005-2430-01
Peak Analysis Performed on: 6/13/2017 3:40:55 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
	1	221-	227	224.85	56.08	0.32	8.71E+000	20.18	2.09E+002
	2	250-	257	253.72	63.30	0.58	7.63E+001	26.52	3.10E+002
M	3	289-	317	300.44	74.97	1.08	2.88E+002	25.29	5.63E+002
m	4	289-	317	309.33	77.19	1.08	4.82E+002	30.33	5.71E+002
M	5	329-	380	337.52	84.24	1.13	9.61E+001	21.34	6.18E+002
m	6	329-	380	349.75	87.30	1.14	1.82E+002	23.67	6.23E+002
m	7	329-	380	361.17	90.15	1.14	1.00E+002	21.46	6.29E+002
m	8	329-	380	372.31	92.93	1.15	2.44E+002	26.23	6.34E+002
	9	737-	751	744.22	185.88	1.16	3.09E+002	38.89	4.18E+002
	10	831-	843	837.56	209.21	0.36	7.57E+001	32.05	3.61E+002
M	11	938-	974	955.40	238.66	1.17	1.42E+003	41.34	2.91E+002
m	12	938-	974	967.39	241.66	1.18	2.58E+002	20.81	2.83E+002
	13	1071-	1088	1081.01	270.05	1.03	1.24E+002	33.30	3.02E+002
	14	1105-	1115	1110.75	277.48	1.22	5.47E+001	21.75	1.75E+002
	15	1174-	1188	1181.73	295.22	1.06	3.07E+002	30.09	2.08E+002
	16	1197-	1210	1201.41	300.14	1.22	8.90E+001	25.06	1.94E+002
	17	1305-	1316	1312.58	327.93	0.74	6.88E+001	21.27	1.53E+002
	18	1347-	1361	1354.21	338.33	1.26	2.88E+002	29.13	1.95E+002
	19	1401-	1415	1408.49	351.89	1.09	6.46E+002	33.64	1.69E+002
	20	1613-	1623	1617.98	404.25	0.50	2.82E+001	16.15	9.68E+001
	21	1847-	1859	1853.15	463.02	0.99	8.36E+001	19.31	1.09E+002
	22	2030-	2057	2044.05	510.73	1.26	3.62E+002	36.57	2.17E+002
	23	2326-	2341	2333.63	583.11	1.33	4.49E+002	29.58	1.42E+002
	24	2428-	2448	2438.32	609.27	1.35	5.64E+002	30.45	9.99E+001
	25	2901-	2918	2910.65	727.31	1.55	1.20E+002	18.62	6.97E+001
M	26	3052-	3080	3056.91	763.87	0.73	1.83E+001	7.19	5.58E+001
m	27	3052-	3080	3075.50	768.51	0.74	2.19E+001	7.82	5.31E+001
	28	3140-	3152	3145.49	786.01	0.90	2.31E+001	13.88	6.39E+001
	29	3171-	3189	3181.15	794.92	1.11	8.23E+001	18.40	7.57E+001
	30	3436-	3451	3443.90	860.58	0.65	5.23E+001	16.36	7.17E+001
	31	3635-	3655	3646.55	911.23	1.82	3.65E+002	23.88	5.69E+001
M	32	3853-	3886	3860.44	964.68	1.48	5.35E+001	10.71	8.41E+001
m	33	3853-	3886	3877.74	969.01	1.48	2.32E+002	17.40	7.80E+001
	34	4476-	4494	4484.06	1120.54	1.27	1.13E+002	18.44	6.65E+001
	35	5508-	5521	5515.00	1378.19	0.81	3.64E+001	10.22	2.46E+001
	36	5835-	5860	5848.46	1461.53	1.71	1.78E+003	43.65	2.92E+001
	37	7055-	7075	7065.83	1765.77	1.42	9.60E+001	13.12	2.10E+001

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 *****
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Detector Name: ERT01
Sample Geometry:
Sample Title: HTC-A01-S005-2430-01
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	4.5697E-001	4.57E-001	1.3652E+001
	Co-60	1173.23	99.85	6.5582E-002	5.64E-002	-1.2249E-002
		1332.49	99.98	5.6435E-002		2.0788E-002
>		2505.71	0.10	0.0000E+000		0.0000E+000
	Cs-137	32.06	5.54	3.1824E+003	5.78E-002	1.9201E+002
		661.66	84.99	5.7805E-002		2.1624E-002
+	Tl-208	72.80	2.02	5.5950E+000	5.08E-002	-1.8157E-003
		74.97*	3.41	1.9779E+000		3.5896E+000
		84.90*	1.51	3.4979E+000		2.0229E+000
		277.36*	6.31	4.4469E-001		2.4886E-001
		510.77*	22.60	2.8524E-001		3.3725E-001
		583.19*	84.50	5.0780E-002		2.2378E-001
		763.13*	1.81	1.4646E+000		5.1843E-001
		860.56*	12.42	3.1902E-001		2.3512E-001
+	Bi-212	39.86	1.06	5.9094E+002	5.33E-001	9.6449E+001
		727.33*	6.74	5.3251E-001		8.8128E-001
		785.37*	1.11	2.9757E+000		1.0845E+000
		1620.74	1.51	3.0723E+000		2.5005E+000
		1806.00	0.09	4.2436E+001		5.6546E+000
+	Pb-212	74.81*	10.40	6.4851E-001	7.23E-002	1.1770E+000
		77.11*	17.50	3.5718E-001		1.0778E+000
		87.30*	7.81	6.3405E-001		6.9274E-001
		115.18	0.59	7.3304E+000		-1.8545E+000
		238.63*	43.30	7.2264E-002		8.5600E-001
		300.09*	3.28	1.0091E+000		8.1106E-001
+	Bi-214	76.86*	0.43	1.4226E+001	8.56E-002	4.2929E+001
		89.81*	0.24	1.8702E+001		1.1179E+001
		386.77	0.30	1.4207E+001		8.8190E-001
		454.77	0.29	1.4842E+001		4.0846E+000
		609.31*	45.49	8.5574E-002		5.2860E-001
		665.45	1.53	3.2886E+000		1.3961E+000
		703.11	0.48	1.0088E+001		6.5583E+000
		719.86	0.39	1.2238E+001		3.1513E+000
		768.36*	4.89	5.1533E-001		2.2329E-001
		786.10*	0.31	1.0331E+001		3.7652E+000
		806.17	1.26	4.1131E+000		1.2543E+000
		934.06	3.10	1.7992E+000		1.0004E+000
		964.08*	0.36	1.0286E+001		8.7338E+000
		1051.96	0.31	1.8434E+001		1.3278E+001
		1120.29*	14.91	3.2667E-001		5.0453E-001

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GWET)	Nuclide MDA (pCi/GWET)	Activity (pCi/GWET)
+	Bi-214	1133.66	0.25	2.3827E+001	8.56E-002	-1.0105E+000
		1155.19	1.63	3.9999E+000		2.6799E+000
		1207.68	0.45	1.5841E+001		3.8384E+000
		1238.11	5.79	1.3801E+000		1.1951E+000
		1280.96	1.43	4.2840E+000		-2.1475E-001
		1377.67*	4.00	8.0520E-001		7.1359E-001
		1385.31	0.76	7.1191E+000		-3.1185E+000
		1401.50	1.27	4.3401E+000		-2.5549E+000
		1407.98	2.15	2.5345E+000		9.3187E-001
		1509.23	2.11	2.1994E+000		-1.5597E+000
		1538.50	0.38	1.2579E+001		3.8247E+000
		1543.32	0.20	2.3336E+001		7.1515E-001
		1583.22	0.69	7.0631E+000		2.9393E+000
		1594.73	0.25	2.2715E+001		1.9442E+001
		1599.31	0.23	2.0993E+001		1.2036E+001
		1661.28	1.15	3.5659E+000		1.2566E+000
		1683.99	0.22	1.9108E+001		3.9470E+000
		1729.59	2.92	1.5413E+000		9.2273E-002
		1764.49	15.40	4.7809E-001		6.3800E-001
		1847.42	2.11	2.1919E+000		-2.4816E-001
		1873.16	0.22	1.6315E+001		-1.2447E+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	3.1515E+001	8.96E-002	4.5547E+000
		74.81*	6.44	1.0154E+000		1.8429E+000
		77.11*	10.80	5.6115E-001		1.6933E+000
		87.30*	4.84	9.9199E-001		1.0838E+000
		242.00*	7.43	3.9421E-001		8.9564E-001
		258.87	0.52	8.1042E+000		1.6916E+000
		274.80	0.47	9.6840E+000		3.6920E+000
		295.22*	19.30	1.7345E-001		4.5712E-001
		351.93*	37.60	8.9599E-002		5.3599E-001
		462.00	0.22	2.1924E+001		1.4915E+001
		533.66	0.19	2.3335E+001		2.3513E+001
		785.96*	1.07	2.9930E+000		1.0908E+000
		839.04	0.59	9.3316E+000		-3.0050E-001
+	Ra-224	81.07	0.13	5.8182E+001	7.37E-001	-2.2075E+000
		83.78*	0.22	2.4340E+001		1.4077E+001
		240.99*	4.10	7.3681E-001		1.6740E+000
+	Ra-226	81.07	0.20	3.7512E+001	1.07E+000	-1.4233E+000
		83.78*	0.33	1.5613E+001		9.0296E+000
		94.90	0.15	4.0358E+001		-3.6526E+000
		186.21*	3.59	1.0662E+000		1.6341E+000
+	Ac-228	99.50	1.26	3.9257E+000	1.58E-001	-1.2774E+000
		129.07	2.50	1.9534E+000		7.3924E-001
		209.25*	3.97	9.0968E-001		4.7120E-001
		270.24*	3.55	1.1838E+000		9.8776E-001
		328.00*	3.04	9.6717E-001		7.0921E-001
		338.32*	11.40	3.1527E-001		8.0481E-001
		409.46	2.02	2.2359E+000		6.7090E-001

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GWET)	Nuclide MDA (pCi/GWET)	Activity (pCi/GWET)
+	Ac-228	463.00*	4.45	6.9039E-001	1.58E-001	7.0585E-001
		755.31	1.03	5.0223E+000		-2.0679E+000
		772.29	1.52	3.9157E+000		9.7644E-004
		794.94*	4.31	9.4218E-001		1.0055E+000
		835.70	1.70	3.3322E+000		1.8044E+000
		911.20*	26.20	1.5784E-001		8.0204E-001
		964.79*	4.99	7.7170E-001		6.5527E-001
		968.96*	15.90	2.3432E-001		8.9284E-001
		1588.20	3.06	1.8907E+000		1.0487E+000
		1630.62	1.52	2.7595E+000		-3.6814E+000
+	Th-228	84.37*	1.26	4.1919E+000	4.19E+000	2.4243E+000
		131.61	0.13	3.7225E+001		1.9528E+001
		166.41	0.10	4.3493E+001		8.6046E+000
		215.98	0.25	1.8487E+001		-5.1168E+000
	Pa-234m	258.23	0.07	5.7673E+001	6.55E+000	2.7756E+001
		742.81	0.09	5.1135E+001		-1.4181E+001
		766.36	0.32	1.7912E+001		4.3488E+000
		786.27	0.05	1.0308E+002		1.1572E+002
		1001.03	0.85	6.5484E+000		1.5569E+000
		1737.77	0.02	2.0111E+002		5.9631E+001
+	Th-234	63.30*	3.75	2.6734E+000	1.05E+000	8.8823E-001
		92.59*	4.33	1.0530E+000		1.0093E+000
		112.81	0.22	2.0211E+001		-7.8737E-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: HTC-A01-S005-2430-01
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	0.923	1460.82*		10.55	1.36524E+001	5.01677E-001
Eu-152m	0.985	89.85*		69.90	3.91929E-002	8.46666E-003
Tl-208	0.974	72.80	@	2.02		
		74.97*	@	3.41	3.58963E+000	3.33085E-001
		84.90*	@	1.51	2.02295E+000	4.52599E-001
		277.36*		6.31	2.48857E-001	9.92670E-002
		510.77*	@	22.60	3.37249E-001	6.59211E-002
		583.19*		84.50	2.23779E-001	1.65786E-002
		763.13*	@	1.81	5.18434E-001	2.03522E-001
		860.56*		12.42	2.35120E-001	7.37851E-002
Bi-211	0.887	351.03*		13.00	1.55441E+000	9.94562E-002
Bi-212	0.763	39.86	@	1.06		
		727.33*		6.74	8.81277E-001	1.39154E-001
		785.37*		1.11	1.08453E+000	6.53437E-001
		1620.74		1.51		
		1806.00	@	0.09		
Pb-212	0.986	74.81*		10.40	1.17698E+000	1.14369E-001
		77.11*		17.50	1.07781E+000	8.10395E-002
		87.30*		7.81	6.92738E-001	9.44840E-002
		115.18	@	0.59		
		238.63*		43.30	8.56002E-001	3.78958E-002
		300.09*		3.28	8.11059E-001	2.30121E-001
Bi-214	0.462	76.86*	@	0.43	4.29293E+001	3.26044E+000
		89.81*	@	0.24	1.11793E+001	2.44808E+000
		386.77	@	0.30		
		454.77	@	0.29		
		609.31*		45.49	5.28596E-001	3.25205E-002
		665.45	@	1.53		
		703.11	@	0.48		
		719.86	@	0.39		
		768.36*		4.89	2.23294E-001	7.97288E-002
		786.10*	@	0.31	3.76515E+000	2.34817E+000
		806.17	@	1.26		
		934.06		3.10		
		964.08*	@	0.36	8.73376E+000	1.78332E+000
		1051.96	@	0.31		
		1120.29*		14.91	5.04531E-001	8.35941E-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	0.462	1280.96	@	1.43		
		1377.67*		4.00	7.13594E-001	2.01458E-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		
		1847.42	@	2.11		
		1873.16	@	0.22		
		2118.55	@	1.14		
		2204.21	@	5.08		
Pb-214	0.956	53.28	@	1.20		
		74.81*		6.44	1.84289E+000	1.81255E-001
		77.11*		10.80	1.69332E+000	1.33426E-001
		87.30*		4.84	1.08382E+000	1.49241E-001
		242.00*		7.43	8.95643E-001	7.88244E-002
		258.87	@	0.52		
		274.80	@	0.47		
		295.22*		19.30	4.57124E-001	4.74399E-002
		351.93*		37.60	5.35992E-001	3.38711E-002
		462.00	@	0.22		
		533.66	@	0.19		
		785.96*	@	1.07	1.09084E+000	6.62208E-001
		839.04	@	0.59		
Ra-224	0.893	81.07	@	0.13		
		83.78*	@	0.22	1.40767E+001	3.19189E+000
		240.99*		4.10	1.67401E+000	1.46656E-001
Ra-226	0.867	81.07	@	0.20		
		83.78*	@	0.33	9.02959E+000	2.04705E+000
		94.90	@	0.15		
		186.21*		3.59	1.63413E+000	2.53541E-001
Ac-228	0.741	99.50	@	1.26		
		129.07	@	2.50		
		209.25*		3.97	4.71196E-001	2.00613E-001
		270.24*		3.55	9.87764E-001	2.68550E-001
		328.00*		3.04	7.09210E-001	2.22056E-001
		338.32*		11.40	8.04815E-001	9.01403E-002
		409.46	@	2.02		
		463.00*		4.45	7.05851E-001	1.68966E-001
		755.31	@	1.03		
		772.29	@	1.52		
		794.94*		4.31	1.00548E+000	2.28363E-001

Nuclide Name	Id Confidence	Energy (keV)		Yield (%)	Activity (pCi/GWET)	Activity Uncertainty
Ac-228	0.741	835.70	@	1.70		
		911.20*		26.20	8.02043E-001	6.15413E-002
		964.79*		4.99	6.55268E-001	1.33906E-001
		968.96*		15.90	8.92841E-001	7.55281E-002
		1588.20		3.06		
		1630.62	@	1.52		
Th-228	0.501	84.37*		1.26	2.42432E+000	5.43764E-001
		131.61	@	0.13		
		166.41	@	0.10		
		215.98		0.25		
Th-234	0.934	63.30*		3.75	8.88231E-001	5.79913E-001
		92.59*		4.33	1.00926E+000	1.69428E-001
		112.81	@	0.22		

* = 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		0.923	1.365241E+001	5.016770E-001
X	Cd-109		0.916		
	Eu-152m		0.985	3.747143E-002	8.460548E-003
X	Tm-170		1.000		
	Tl-208	@	0.974	2.252503E-001	1.585517E-002
	Bi-211		0.887	3.926172E-001	1.567481E-001
	Bi-212	@	0.763	8.668535E-001	1.352834E-001
	Pb-212	@	0.986	8.033186E-001	3.115848E-002
	Bi-214	@	0.462	4.910398E-001	2.799837E-002
	Pb-214	@	0.956	4.006104E-001	4.250461E-002
	Ra-224	@	0.893	9.252476E-001	1.655374E-001
	Ra-226	@	0.867	1.634132E+000	2.520653E-001
	Ac-228	@	0.741	8.034609E-001	3.477372E-002
	Th-228	@	0.501	1.556291E+000	5.476825E-001
X	Th-231		0.837		
	Th-234	@	0.934	9.997375E-001	1.626290E-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: 6/13/2017 3:40:55 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
1	56.08	1.2094E-003	231.74		
20	404.25	3.9097E-003	57.38	Sum	
37	1765.77	1.2600E-002	14.54		

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

Errors quoted at 1.000 sigma