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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-HTC-A01-S001-2430-01.CNF

Report Generated On              : 6/7/2017   12:16:40 AM

Sample Title                     : HTC-A01-S001-2430-01
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                      :  8.388E+002 GWET

Sample Taken On                  : 5/13/2017   1:24:00 PM
Acquisition Started              : 6/6/2017   10:16:33 PM

Live Time                        :     7200.0 seconds
Real Time                        :     7203.1 seconds

Dead Time                        :   0.04 %


            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-S001-2430-01
Peak Analysis Performed on: 6/7/2017 12:16:40 AM
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	289-	316	300.08	74.88	1.04	7.75E+002	40.33	1.37E+003
m	2	289-	316	308.90	77.09	1.04	1.21E+003	46.59	1.33E+003
M	3	332-	384	337.30	84.18	1.29	2.38E+002	34.09	1.30E+003
m	4	332-	384	349.51	87.24	1.29	5.57E+002	39.17	1.54E+003
m	5	332-	384	360.11	89.88	1.30	4.27E+002	36.32	1.42E+003
m	6	332-	384	372.91	93.08	1.30	6.29E+002	40.18	1.37E+003
	7	396-	406	399.21	99.66	0.97	6.15E+001	48.02	9.36E+002
	8	456-	467	460.30	114.92	0.54	8.48E+001	50.30	9.73E+002
	9	510-	524	516.68	129.02	1.22	1.65E+002	63.66	1.35E+003
	10	736-	760	744.30	185.90	1.06	4.96E+002	86.20	1.67E+003
	11	829-	844	837.69	209.24	0.73	3.50E+002	57.18	9.72E+002
M	12	947-	979	954.91	238.54	1.12	4.75E+003	73.53	7.09E+002
m	13	947-	979	966.03	241.32	1.12	5.54E+002	30.28	5.88E+002
	14	1074-	1092	1080.91	270.03	1.28	4.03E+002	49.55	6.02E+002
	15	1104-	1116	1109.66	277.21	1.41	2.64E+002	36.81	4.13E+002
	16	1175-	1192	1181.01	295.04	1.07	6.64E+002	49.61	5.45E+002
	17	1193-	1210	1200.76	299.98	1.16	2.85E+002	43.83	5.02E+002
	18	1304-	1316	1312.10	327.81	1.11	2.02E+002	33.74	3.56E+002
	19	1345-	1359	1353.47	338.14	1.09	9.21E+002	46.12	4.20E+002
	20	1399-	1414	1407.75	351.71	1.08	1.20E+003	49.05	4.01E+002
	21	1634-	1650	1638.29	409.33	1.21	1.43E+002	32.87	2.96E+002
	22	1846-	1859	1852.06	462.75	1.20	2.66E+002	30.85	2.48E+002
	23	2028-	2055	2042.86	510.44	1.53	7.14E+002	51.47	4.30E+002
	24	2325-	2341	2332.61	582.85	1.34	1.69E+003	49.06	2.29E+002
	25	2428-	2445	2437.22	609.00	1.42	9.05E+002	39.26	1.96E+002
	26	2898-	2918	2908.80	726.85	1.57	3.91E+002	33.53	2.02E+002
	27	3015-	3031	3020.58	754.79	0.79	7.60E+001	20.88	1.13E+002
M	28	3069-	3097	3073.52	768.02	0.76	5.48E+001	11.46	1.11E+002
m	29	3069-	3097	3089.31	771.96	0.77	4.73E+001	10.46	9.29E+001
	30	3171-	3189	3179.49	794.50	0.83	2.01E+002	26.17	1.43E+002
	31	3332-	3350	3342.10	835.14	1.42	9.29E+001	21.08	1.04E+002
	32	3431-	3453	3442.05	860.12	1.44	2.37E+002	25.55	1.07E+002
	33	3632-	3658	3645.05	910.85	1.51	1.17E+003	41.66	1.29E+002
	34	3731-	3742	3736.26	933.65	0.95	2.42E+001	13.94	6.68E+001
M	35	3849-	3891	3859.21	964.38	1.70	1.94E+002	16.33	1.02E+002
m	36	3849-	3891	3876.38	968.67	1.70	7.47E+002	28.92	7.10E+001
	37	3999-	4011	4004.74	1000.75	0.36	4.60E+001	14.65	6.40E+001
	38	4475-	4493	4481.41	1119.88	1.43	2.03E+002	22.96	9.21E+001
	39	4946-	4961	4953.72	1237.92	0.56	5.82E+001	18.46	9.38E+001
	40	5506-	5522	5512.87	1377.66	0.88	6.51E+001	14.12	4.29E+001
	41	5830-	5860	5845.89	1460.89	1.79	1.82E+003	45.05	4.27E+001
	42	5979-	5990	5984.54	1495.54	0.48	7.73E+000	10.61	3.73E+001

	Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
	43	6033-	6046	6039.97	1509.39	0.56	2.42E+001	10.31	2.98E+001
M	44	6346-	6383	6355.15	1588.16	1.67	9.63E+001	11.84	4.32E+001
m	45	6346-	6383	6374.52	1593.00	1.67	3.86E+001	8.94	5.51E+001
	46	6479-	6494	6485.89	1620.84	1.22	5.00E+001	12.16	3.20E+001
	47	6916-	6930	6922.97	1730.07	0.73	3.67E+001	9.45	1.83E+001
	48	7052-	7073	7063.11	1765.09	1.27	1.90E+002	15.86	1.65E+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-S001-2430-01
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	5.4780E-001	5.48E-001	1.3451E+001
	Co-60	1173.23	99.85	7.4305E-002	6.01E-002	-2.7093E-002
		1332.49	99.98	6.0145E-002		-1.7303E-002
>		2505.71	0.10	0.0000E+000		0.0000E+000
	Cs-137	32.06	5.54	4.5701E+003	7.61E-002	-8.7288E+002
		661.66	84.99	7.6061E-002		4.0724E-002
+	Tl-208	72.80	2.02	8.4555E+000	6.22E-002	-1.6816E+000
		74.97*	3.41	2.9513E+000		9.2781E+000
		84.90*	1.51	4.8366E+000		4.8120E+000
		277.36*	6.31	6.8034E-001		1.1476E+000
		510.77*	22.60	3.6615E-001		9.1389E-001
		583.19*	84.50	6.2238E-002		8.1605E-001
		763.13	1.81	3.9362E+000		-3.8575E-001
		860.56*	12.42	4.1974E-001		1.0213E+000
+	Bi-212	39.86	1.06	8.5265E+002	9.03E-001	-2.7637E+001
		727.33*	6.74	9.0250E-001		2.7442E+000
		785.37	1.11	6.3162E+000		6.0981E+000
		1620.74*	1.51	2.7588E+000		2.8322E+000
		1806.00	0.09	5.2262E+001		-2.5859E+000
+	Pb-212	74.81*	10.40	9.6768E-001	1.05E-001	3.0421E+000
		77.11*	17.50	5.2126E-001		2.6060E+000
		87.30*	7.81	9.5033E-001		2.0271E+000
		115.18*	0.59	8.3367E+000		3.0380E+000
		238.63*	43.30	1.0524E-001		2.7671E+000
		300.09*	3.28	1.6660E+000		2.4875E+000
+	Bi-214	76.86*	0.43	2.0902E+001	1.08E-001	1.0450E+002
		89.81*	0.24	2.7041E+001		4.6139E+001
		386.77	0.30	1.9660E+001		2.9555E+000
		454.77	0.29	2.0247E+001		-3.5786E+000
		609.31*	45.49	1.0833E-001		8.1769E-001
		665.45	1.53	4.1550E+000		8.6526E-001
		703.11	0.48	1.3169E+001		4.2370E-001
		719.86	0.39	1.6283E+001		1.1442E+000
		768.36*	4.89	7.0748E-001		5.3778E-001
		786.10	0.31	2.2076E+001		1.3784E+001
		806.17	1.26	4.8120E+000		2.5417E+000
		934.06*	3.10	1.1370E+000		4.3439E-001
		964.08*	0.36	1.0853E+001		3.0536E+001
		1051.96	0.31	1.9575E+001		5.5170E-002
		1120.29*	14.91	3.7354E-001		8.7648E-001

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GWET)	Nuclide MDA (pCi/GWET)	Activity (pCi/GWET)
+	Bi-214	1133.66	0.25	2.7852E+001	1.08E-001	-2.0942E+000
		1155.19	1.63	4.2928E+000		-8.4838E-001
		1207.68	0.45	1.6589E+001		1.9639E-001
		1238.11*	5.79	9.7438E-001		7.0086E-001
		1280.96	1.43	4.9107E+000		2.4364E+000
		1377.67*	4.00	1.0700E+000		1.2314E+000
		1385.31	0.76	7.8748E+000		8.4065E-001
		1401.50	1.27	4.9840E+000		2.5422E+000
		1407.98	2.15	3.1299E+000		3.5299E+000
		1509.23*	2.11	1.7064E+000		9.2120E-001
		1538.50	0.38	1.3685E+001		-8.6910E+000
		1543.32	0.20	2.5617E+001		-1.6168E+001
		1583.22	0.69	1.2044E+001		2.6487E+000
		1594.73	0.25	3.3930E+001		-1.5079E+000
		1599.31	0.23	2.7806E+001		2.1576E+000
		1661.28	1.15	5.0998E+000		8.7102E-001
		1683.99	0.22	2.2869E+001		2.2330E+001
		1729.59*	2.92	1.0704E+000		1.0792E+000
		1764.49*	15.40	2.3228E-001		1.0342E+000
		1847.42	2.11	2.8220E+000		1.5819E+000
		1873.16	0.22	2.3095E+001		6.7323E+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	4.5201E+001	1.34E-001	1.5967E+001
		74.81*	6.44	1.5254E+000		4.7955E+000
		77.11*	10.80	8.2446E-001		4.1219E+000
		87.30*	4.84	1.4969E+000		3.1929E+000
		242.00*	7.43	5.4348E-001		1.8549E+000
		258.87	0.52	1.1372E+001		6.7545E+000
		274.80	0.47	1.3880E+001		-2.9001E+000
		295.22*	19.30	2.8690E-001		9.5323E-001
		351.93*	37.60	1.3366E-001		9.6229E-001
		462.00*	0.22	1.9777E+001		4.2166E+001
		533.66	0.19	3.1736E+001		4.4873E+000
		785.96	1.07	6.3919E+000		3.9909E+000
		839.04	0.59	1.1859E+001		1.0037E+000
+	Ra-224	81.07	0.13	8.3623E+001	1.01E+000	2.5432E+000
		83.78*	0.22	3.3656E+001		3.3485E+001
		240.99*	4.10	1.0090E+000		3.4437E+000
+	Ra-226	81.07	0.20	5.4279E+001	2.38E+000	1.6508E+000
		83.78*	0.33	2.1735E+001		2.1624E+001
		94.90	0.15	5.7717E+001		-5.7512E+000
		186.21*	3.59	2.3842E+000		2.7110E+000
+	Ac-228	99.50*	1.26	4.1712E+000	2.15E-001	1.1495E+000
		129.07*	2.50	2.4074E+000		1.3611E+000
		209.25*	3.97	1.5142E+000		2.0846E+000
		270.24*	3.55	1.6274E+000		3.0741E+000
		328.00*	3.04	1.4309E+000		1.9987E+000
		338.32*	11.40	4.3941E-001		2.4650E+000
		409.46*	2.02	2.4216E+000		2.3801E+000

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GWET)	Nuclide MDA (pCi/GWET)	Activity (pCi/GWET)
+	Ac-228	463.00*	4.45	1.0062E+000	2.15E-001	2.1453E+000
		755.31*	1.03	4.2864E+000		3.5849E+000
		772.29*	1.52	2.1455E+000		1.5364E+000
		794.94*	4.31	1.2278E+000		2.3462E+000
		835.70*	1.70	2.7649E+000		2.8580E+000
		911.20*	26.20	2.4455E-001		2.4766E+000
		964.79*	4.99	8.0879E-001		2.2757E+000
		968.96*	15.90	2.1456E-001		2.7575E+000
		1588.20*	3.06	1.2711E+000		2.6643E+000
		1630.62	1.52	4.6990E+000		4.8880E-001
	Th-228	84.37*	1.26	5.7963E+000	5.80E+000	5.7668E+000
		131.61	0.13	5.4352E+001		1.9144E+001
		166.41	0.10	6.2769E+001		8.6702E+000
		215.98	0.25	2.6518E+001		4.1501E+000
	Pa-234m	258.23	0.07	8.1304E+001	7.87E+000	6.3748E+001
		742.81	0.09	6.6750E+001		5.0405E+001
		766.36	0.32	2.2391E+001		-2.2018E+000
		786.27	0.05	1.2779E+002		5.0538E+001
		1001.03	0.85	7.8695E+000		4.9646E+000
		1737.77	0.02	2.6012E+002		-1.0179E+002
	Th-234	63.30	3.75	6.3351E+000	2.20E+000	2.7072E+000
		92.59	4.33	2.1960E+000		5.5891E+000
		112.81	0.22	3.0033E+001		-8.2466E+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-S001-2430-01
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	0.999	1460.82*		10.55	1.34514E+001	4.96408E-001
Mn-54	0.985	834.84*		99.97	5.00803E-002	1.14222E-002
Eu-152m	1.000	89.85*		69.90	1.61604E-001	1.44615E-002
Tm-170	0.999	84.25*		2.48	3.26473E+000	4.90113E-001
Tl-208	0.939	72.80	@	2.02		
		74.97*	@	3.41	9.27809E+000	5.58236E-001
		84.90*	@	1.51	4.81203E+000	7.00967E-001
		277.36*		6.31	1.14760E+000	1.65227E-001
		510.77*	@	22.60	9.13894E-001	9.18365E-002
		583.19*		84.50	8.16051E-001	3.48392E-002
		763.13	@	1.81		
		860.56*		12.42	1.02127E+000	1.12779E-001
TL-208e	0.965	1592.53*		99.16	3.30335E-002	7.90609E-003
Bi-211	0.928	351.03*		13.00	2.78909E+000	1.52891E-001
Bi-212	0.754	39.86	@	1.06		
		727.33*		6.74	2.74423E+000	2.50320E-001
		785.37		1.11		
		1620.74*		1.51	2.83223E+000	6.95039E-001
		1806.00	@	0.09		
Pb-212	0.999	74.81*		10.40	3.04214E+000	2.02986E-001
		77.11*		17.50	2.60600E+000	1.46861E-001
		87.30*		7.81	2.02708E+000	1.66058E-001
		115.18*	@	0.59	3.03802E+000	1.80422E+000
		238.63*		43.30	2.76710E+000	1.00706E-001
		300.09*		3.28	2.48755E+000	3.91809E-001
Bi-214	0.763	76.86*	@	0.43	1.04498E+002	5.99457E+000
		89.81*	@	0.24	4.61389E+001	4.44824E+000
		386.77	@	0.30		
		454.77	@	0.29		
		609.31*		45.49	8.17689E-001	4.28918E-002
		665.45	@	1.53		
		703.11	@	0.48		
		719.86	@	0.39		
		768.36*		4.89	5.37776E-001	1.13202E-001
		786.10	@	0.31		
		806.17	@	1.26		
		934.06*		3.10	4.34393E-001	2.50353E-001
		964.08*	@	0.36	3.05362E+001	2.84728E+000
		1051.96	@	0.31		
		1120.29*		14.91	8.76481E-001	1.01466E-001
		1133.66	@	0.25		

Nuclide Name	Id Confidence	Energy (keV)		Yield (%)	Activity (pCi/GWET)	Activity Uncertainty
Bi-214	0.763	1155.19	@	1.63		
		1207.68	@	0.45		
		1238.11*		5.79	7.00862E-001	2.23300E-001
		1280.96	@	1.43		
		1377.67*		4.00	1.23138E+000	2.69412E-001
		1385.31	@	0.76		
		1401.50	@	1.27		
		1407.98	@	2.15		
		1509.23*	@	2.11	9.21203E-001	3.93413E-001
		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	1.07925E+000	2.80028E-001
		1764.49*		15.40	1.03416E+000	9.64694E-002
		1847.42	@	2.11		
		1873.16	@	0.22		
		2118.55	@	1.14		
		2204.21	@	5.08		
Pb-214	0.936	53.28	@	1.20		
		74.81*		6.44	4.79548E+000	3.28181E-001
		77.11*		10.80	4.12187E+000	2.51781E-001
		87.30*		4.84	3.19287E+000	2.68454E-001
		242.00*		7.43	1.85492E+000	1.20353E-001
		258.87	@	0.52		
		274.80	@	0.47		
		295.22*		19.30	9.53235E-001	7.82671E-002
		351.93*		37.60	9.62295E-001	5.18615E-002
		462.00*	@	0.22	4.21661E+001	5.37249E+000
		533.66	@	0.19		
		785.96	@	1.07		
		839.04	@	0.59		
Ra-224	0.941	81.07	@	0.13		
		83.78*	@	0.22	3.34846E+001	5.03148E+000
		240.99*		4.10	3.44369E+000	2.21560E-001
Ra-226	0.869	81.07	@	0.20		
		83.78*	@	0.33	2.16240E+001	3.24780E+000
		94.90	@	0.15		
		186.21*		3.59	2.71097E+000	5.33108E-001
Ac-228	0.967	99.50*	@	1.26	1.14950E+000	8.99345E-001
		129.07*	@	2.50	1.36112E+000	5.26096E-001
		209.25*		3.97	2.08458E+000	3.53521E-001
		270.24*		3.55	3.07410E+000	4.00091E-001
		328.00*		3.04	1.99873E+000	3.47044E-001
		338.32*		11.40	2.46499E+000	1.71126E-001
		409.46*	@	2.02	2.38006E+000	5.58664E-001
		463.00*		4.45	2.14528E+000	2.83666E-001

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/GWET)	Activity Uncertainty
Ac-228	0.967	755.31* @	1.03	3.58492E+000	9.98066E-001
		772.29* @	1.52	1.53643E+000	3.46913E-001
		794.94*	4.31	2.34618E+000	3.20260E-001
		835.70* @	1.70	2.85802E+000	6.62389E-001
		911.20*	26.20	2.47663E+000	1.29710E-001
		964.79*	4.99	2.27567E+000	2.13016E-001
		968.96*	15.90	2.75749E+000	1.51342E-001
		1588.20*	3.06	2.66431E+000	3.50712E-001
		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

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***** 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		0.999	1.345138E+001	4.964082E-001
	Mn-54		0.985	6.536540E-003	1.146942E-002
X	Cd-109		0.903		
	Eu-152m		1.000	1.587238E-001	1.439528E-002
	Tm-170		0.999	2.085267E+000	4.834251E-001
	Tl-208	@	0.939	8.449396E-001	3.202680E-002
	TL-208e		0.965	3.303352E-002	7.906086E-003
	Bi-211		0.928	5.659559E-001	2.565452E-001
	Bi-212	@	0.754	2.754335E+000	2.355119E-001
	Pb-212	@	0.999	2.319614E+000	6.841172E-002
	Bi-214	@	0.763	8.222201E-001	3.367418E-002
	Pb-214	@	0.936	7.670280E-001	7.245565E-002
	Ra-224	@	0.941	2.019691E+000	2.557727E-001
	Ra-226	@	0.869	2.710972E+000	5.311791E-001
	Ac-228	@	0.967	2.484988E+000	5.933812E-002
X	Th-228		0.499		
X	Th-231		0.837		

? = 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: 6/7/2017 12:16:40 AM
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
m 6	93.08	7.6783E-002	7.35	Tol.	Yb-169 Th-227 Th-234
37	1000.75	5.8298E-003	35.17	Sum	
42	1495.54	1.0741E-003	137.22	Sum	

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

Errors quoted at 1.000 sigma