```
*************************************************************************
*****        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-S003-0612-01.CNF

Report Generated On              : 6/9/2017    3:02:08 PM

Sample Title                     : HTC-A01-S003-0612-01
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                      :  1.024E+003 GWET

Sample Taken On                  : 5/13/2017  10:41:00 AM
Acquisition Started              : 6/9/2017    1:02:05 PM

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 *****
****

Detector Name: ERT01
Sample Title: HTC-A01-S003-0612-01
Peak Analysis Performed on: 6/9/2017 3:02:08 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	290-	317	300.07	74.88	1.04	1.47E+002	20.29	4.44E+002
m	2	290-	317	308.79	77.06	1.04	2.20E+002	22.43	4.10E+002
	3	738-	753	744.70	186.00	1.21	1.56E+002	34.89	3.51E+002
	4	833-	845	837.35	209.16	0.61	9.15E+001	27.01	2.41E+002
M	5	948-	977	954.82	238.52	1.11	7.12E+002	30.50	2.26E+002
m	6	948-	977	967.49	241.68	1.11	1.60E+002	16.75	2.02E+002
	7	1071-	1085	1079.99	269.80	1.01	5.77E+001	24.40	1.84E+002
	8	1172-	1187	1180.51	294.92	1.13	2.27E+002	27.26	1.71E+002
	9	1346-	1361	1353.05	338.04	0.96	1.32E+002	24.81	1.61E+002
	10	1399-	1416	1407.48	351.64	1.07	4.26E+002	31.42	1.73E+002
	11	2034-	2050	2042.85	510.44	1.40	2.40E+002	24.75	1.19E+002
	12	2324-	2339	2332.04	582.71	1.40	2.43E+002	22.25	8.39E+001
	13	2427-	2445	2436.66	608.85	1.32	3.37E+002	25.37	9.04E+001
	14	2901-	2918	2908.24	726.71	1.33	7.86E+001	15.67	5.14E+001
	15	3203-	3215	3209.31	801.96	0.64	2.11E+001	10.11	3.09E+001
	16	3436-	3447	3441.97	860.10	0.56	9.00E+000	11.36	4.80E+001
	17	3635-	3653	3644.73	910.78	1.53	1.74E+002	18.95	5.47E+001
	18	3867-	3885	3876.19	968.62	0.59	1.01E+002	18.46	7.10E+001
	19	4473-	4488	4481.37	1119.87	1.50	8.00E+001	14.56	4.40E+001
	20	4949-	4961	4954.58	1238.13	1.04	3.66E+001	11.52	3.64E+001
	21	5506-	5518	5512.58	1377.59	0.45	1.84E+001	7.53	1.46E+001
	22	5831-	5858	5845.19	1460.71	1.68	1.01E+003	33.23	2.10E+001
	23	6366-	6379	6372.11	1592.40	0.77	1.96E+001	6.45	7.43E+000
	24	7051-	7074	7062.45	1764.93	0.80	9.50E+001	11.96	1.20E+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 *****
****

Detector Name: ERT01
Sample Geometry:
Sample Title: HTC-A01-S003-0612-01
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	3.2452E-001	3.25E-001	6.0615E+000
	Co-60	1173.23	99.85	4.2723E-002	3.91E-002	-1.0345E-002
		1332.49	99.98	3.9093E-002		1.2558E-002
>		2505.71	0.10	0.0000E+000		0.0000E+000
	Cs-137	32.06	5.54	2.1750E+003	3.80E-002	-5.0744E+002
		661.66	84.99	3.8028E-002		5.0703E-004
+	Tl-208	72.80	2.02	3.6556E+000	3.12E-002	3.7772E-001
		74.97*	3.41	1.3889E+000		1.4479E+000
		84.90	1.51	3.2322E+000		2.2542E+000
		277.36	6.31	5.0128E-001		-5.4732E-002
		510.77*	22.60	1.5850E-001		9.6746E-002
		583.19*	84.50	3.1234E-002		9.4066E-002
		763.13	1.81	2.0943E+000		5.1053E-001
		860.56*	12.42	1.8974E-001		3.1819E-002
+	Bi-212	39.86	1.06	4.0234E+002	3.62E-001	1.4631E+002
		727.33*	6.74	3.6195E-001		4.5272E-001
		785.37	1.11	3.1752E+000		1.1061E+000
		1620.74	1.51	2.3546E+000		2.1544E+000
		1806.00	0.09	3.0498E+001		-1.7998E+001
+	Pb-212	74.81*	10.40	4.5539E-001	5.06E-002	4.7475E-001
		77.11*	17.50	2.4009E-001		3.8871E-001
		87.30	7.81	5.9589E-001		1.2698E-001
		115.18	0.59	5.3503E+000		3.6310E+000
		238.63*	43.30	5.0581E-002		3.3134E-001
		300.09	3.28	9.8168E-001		-5.9718E-001
+	Bi-214	76.86*	0.43	9.6014E+000	6.23E-002	1.5545E+001
		89.81	0.24	1.8382E+001		-7.4986E+000
		386.77	0.30	9.5573E+000		1.5350E+000
		454.77	0.29	1.0220E+001		1.6344E+000
		609.31*	45.49	6.2300E-002		2.4905E-001
		665.45	1.53	2.1115E+000		1.4105E+000
		703.11	0.48	7.0703E+000		3.2703E+000
		719.86	0.39	7.8794E+000		-2.7717E+000
		768.36	4.89	7.5971E-001		-4.6546E-002
		786.10	0.31	1.1114E+001		6.1675E+000
		806.17	1.26	2.7628E+000		1.5393E-001
		934.06	3.10	1.1339E+000		3.2719E-001
		964.08	0.36	1.4468E+001		1.1273E+000
		1051.96	0.31	1.2140E+001		5.5126E+000
		1120.29*	14.91	1.9870E-001		2.8318E-001

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GWET)	Nuclide MDA (pCi/GWET)	Activity (pCi/GWET)
+	Bi-214	1133.66	0.25	1.6299E+001	6.23E-002	-5.0355E+000
		1155.19	1.63	2.6366E+000		-7.1782E-001
		1207.68	0.45	1.0705E+001		2.6223E+000
		1238.11*	5.79	4.7691E-001		3.6197E-001
		1280.96	1.43	2.8103E+000		-2.9664E-001
		1377.67*	4.00	4.8705E-001		2.8557E-001
		1385.31	0.76	4.4748E+000		-8.1095E-001
		1401.50	1.27	2.8104E+000		3.8126E-001
		1407.98	2.15	1.6173E+000		1.8890E-001
		1509.23	2.11	1.5908E+000		1.4696E+000
		1538.50	0.38	7.7483E+000		-3.1507E+000
		1543.32	0.20	1.5271E+001		5.1644E+000
		1583.22	0.69	5.1725E+000		3.5302E+000
		1594.73	0.25	1.4087E+001		1.4922E+000
		1599.31	0.23	1.3831E+001		-5.9078E-001
		1661.28	1.15	2.4353E+000		-1.9280E+000
		1683.99	0.22	1.3049E+001		3.7872E+000
		1729.59	2.92	1.1955E+000		-1.5207E-001
		1764.49*	15.40	1.7142E-001		4.1251E-001
		1847.42	2.11	1.4851E+000		5.2517E-001
		1873.16	0.22	1.3078E+001		8.1080E+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	2.0671E+001	7.58E-002	-8.3068E+000
		74.81*	6.44	7.1591E-001		7.4635E-001
		77.11*	10.80	3.7872E-001		6.1315E-001
		87.30	4.84	9.3606E-001		1.9947E-001
		242.00*	7.43	2.6403E-001		4.3858E-001
		258.87	0.52	5.5532E+000		4.6356E-002
		274.80	0.47	6.6619E+000		3.8784E+000
		295.22*	19.30	1.2734E-001		2.6723E-001
		351.93*	37.60	7.5763E-002		2.7774E-001
		462.00	0.22	1.4026E+001		-4.6685E+000
		533.66	0.19	1.6359E+001		1.0485E+001
		785.96	1.07	3.2179E+000		1.7857E+000
		839.04	0.59	6.1223E+000		2.0902E+000
+	Ra-224	81.07	0.13	3.8116E+001	4.92E-001	-1.3834E+001
		83.78	0.22	2.2215E+001		-6.6544E+000
		240.99*	4.10	4.9151E-001		8.1644E-001
+	Ra-226	81.07	0.20	2.4674E+001	7.95E-001	-8.9554E+000
		83.78	0.33	1.4308E+001		-4.2857E+000
		94.90	0.15	2.6358E+001		2.2615E+001
		186.21*	3.59	7.9482E-001		5.2932E-001
	Ac-228	99.50	1.26	2.7181E+000	2.09E-001	1.5325E+000
		129.07	2.50	1.2749E+000		4.7194E-001
		209.25	3.97	8.4998E-001		4.4169E-001
		270.24	3.55	9.2775E-001		7.7828E-001
		328.00	3.04	1.0751E+000		2.1988E-001
		338.32	11.40	3.2498E-001		4.0844E-001
		409.46	2.02	1.5692E+000		7.1900E-002

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GWET)	Nuclide MDA (pCi/GWET)	Activity (pCi/GWET)
Ac-228	463.00	4.45	7.4450E-001	2.09E-001	3.5177E-001
	755.31	1.03	3.2348E+000		-2.5656E-001
	772.29	1.52	2.4649E+000		3.2899E-001
	794.94	4.31	8.0728E-001		2.5210E-001
	835.70	1.70	2.1639E+000		1.3143E+000
	911.20	26.20	2.0867E-001		3.4361E-001
	964.79	4.99	1.0838E+000		1.8633E-001
	968.96	15.90	3.4316E-001		3.6682E-001
	1588.20	3.06	1.2850E+000		2.4348E-001
	1630.62	1.52	2.4071E+000		-1.5096E+000
Th-228	84.37	1.26	3.9028E+000	3.90E+000	2.7816E+000
	131.61	0.13	2.4479E+001		7.9902E+000
	166.41	0.10	2.9350E+001		5.3967E+000
	215.98	0.25	1.2626E+001		6.4529E+000
Pa-234m	258.23	0.07	3.9473E+001	4.44E+000	-1.5222E-001
	742.81	0.09	3.3553E+001		-3.9450E+000
	766.36	0.32	1.1574E+001		2.1874E+000
	786.27	0.05	6.3678E+001		3.3943E+001
	1001.03	0.85	4.4351E+000		1.1776E+000
	1737.77	0.02	1.3510E+002		-2.5104E+002
Th-234	63.30	3.75	2.8618E+000	9.81E-001	1.8913E+000
	92.59	4.33	9.8143E-001		1.2788E+000
	112.81	0.22	1.4282E+001		-2.5276E-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-S003-0612-01
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	0.998	1460.82*		10.55	6.06147E+000	2.61666E-001
Tl-208	0.816	72.80	@	2.02		
		74.97*	@	3.41	1.44791E+000	2.04340E-001
		84.90	@	1.51		
		277.36		6.31		
		510.77*	@	22.60	9.67459E-002	3.53648E-002
		583.19*		84.50	9.40655E-002	9.38613E-003
		763.13	@	1.81		
		860.56*		12.42	3.18190E-002	4.01762E-002
TL-208e	0.997	1592.53*		99.16	1.37424E-002	4.60423E-003
Bi-211	0.942	351.03*		13.00	8.05173E-001	6.72008E-002
Bi-212	0.542	39.86	@	1.06		
		727.33*		6.74	4.52720E-001	9.14049E-002
		785.37		1.11		
		1620.74		1.51		
		1806.00	@	0.09		
Pb-212	0.768	74.81*		10.40	4.74748E-001	6.83852E-002
		77.11*		17.50	3.88706E-001	4.27416E-002
		87.30		7.81		
		115.18	@	0.59		
		238.63*		43.30	3.31335E-001	1.83427E-002
		300.09		3.28		
Bi-214	0.592	76.86*	@	0.43	1.55446E+001	1.71737E+000
		89.81	@	0.24		
		386.77	@	0.30		
		454.77	@	0.29		
		609.31*		45.49	2.49050E-001	2.01617E-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	2.83177E-001	5.19965E-002
		1133.66	@	0.25		
		1155.19	@	1.63		
		1207.68	@	0.45		
		1238.11*		5.79	3.61974E-001	1.14255E-001

Nuclide Name	Id Confidence	Energy (keV)		Yield (%)	Activity (pCi/GWET)	Activity Uncertainty
Bi-214	0.592	1280.96	@	1.43		
		1377.67*		4.00	2.85574E-001	1.16848E-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	4.12515E-001	5.72312E-002
		1847.42	@	2.11		
		1873.16	@	0.22		
		2118.55	@	1.14		
		2204.21	@	5.08		
Pb-214	0.842	53.28	@	1.20		
		74.81*		6.44	7.46347E-001	1.08105E-001
		77.11*		10.80	6.13149E-001	6.89522E-002
		87.30		4.84		
		242.00*		7.43	4.38581E-001	4.84927E-002
		258.87	@	0.52		
		274.80	@	0.47		
		295.22*		19.30	2.67225E-001	3.33136E-002
		351.93*		37.60	2.77737E-001	2.30125E-002
		462.00	@	0.22		
		533.66	@	0.19		
		785.96	@	1.07		
		839.04	@	0.59		
Ra-224	0.818	81.07	@	0.13		
		83.78	@	0.22		
		240.99*		4.10	8.16439E-001	9.00109E-002
Ra-226	0.771	81.07	@	0.20		
		83.78	@	0.33		
		94.90	@	0.15		
		186.21*		3.59	5.29316E-001	1.76613E-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		0.998	6.061467E+000	2.616663E-001
Tl-208	@	0.816	9.076047E-002	9.101993E-003
TL-208e		0.997	1.374237E-002	4.604226E-003
Bi-211		0.942	1.331469E-001	1.076649E-001
Bi-212	@	0.542	4.527197E-001	9.140493E-002
Pb-212	@	0.768	3.147596E-001	1.654590E-002
Bi-214	@	0.592	2.712516E-001	1.742122E-002
Pb-214	@	0.842	2.318088E-001	2.929813E-002
Ra-224	@	0.818	3.849156E-001	1.047733E-001
Ra-226	@	0.771	5.293160E-001	1.766134E-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 3:02:08 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	209.16	1.2708E-002	29.52	Tol.	Lu-177 Ac-228 Np-239
7	269.80	8.0099E-003	42.32	Tol.	Ra-223 Ac-228
9	338.04	1.8384E-002	18.74	Tol.	Ra-223 Ac-228
15	801.96	2.3429E-003	60.92	Sum	
17	910.78	2.3476E-002	11.27	Tol.	Ac-228
18	968.62	1.4025E-002	18.28	Sum	

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

Errors quoted at 1.000 sigma