Date: _____

9626 Niagara Falls Blvd Onsite Gamma Spec Screening Lab

Gamma Spectroscopy Detector work sheet.

Counted by (Initial,date)	Geometry Description	Analysis Number/Sample ID/Remarks	Sample Collection mmddyy hh:mm	Sample Quantity	Sample Units (GWET,GDR Y,L, ft^3, etc)	Count Time (s)	Report Matches Sample Parameters (Initial, date)
CC/121016	450 cc SOIL	A5-CS001-0006-01	12-8-16 1355	871.2	GWET	7200	
CC/121016	450 cc SOIL	A5-CS002-0006-01	12-9-16 1445	867.8	GWET	7200	
CC/121216	450 cc SOIL	A5-CS003-0006-01	12-8-16 1400	995.2	GWET	7200	
CC/121216	450 cc SOIL	A5-CS004-0006-01	12-8-16 1405	974.9	GWET	7200	
CC/121216	450 cc SOIL	Duplicate A5-CS004-0006-02	12-8-16 1405	984.8	GWET	7200	
CC/121316	450 cc SOIL	A5-CS005-0006-01	12-9-16 1450	730.6	GWET	7200	
CC/121416	450 cc SOIL	A5-CS006-0006-01	12-8-16 1410	802.7	GWET	7200	
CC/121416	450 cc SOIL	A5-CS007-0006-01	12-8-16 1415	912.7	GWET	7200	
CC/121516	450 cc SOIL	A5-CS015-0006-01	12-13-16 0915	699.5	GWET	7200	
CC/121516	450 cc SOIL	A5-CS008-0006-01	12-8-16 1420	823.3	GWET	7200	

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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        *****
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Filename: ERT01,C:\GENIE2K\CAMFILES\SMP-A5-CS015-0006-01.CNF

Report Generated On	: 12/15/2016 3:17:05 PM
Sample Title	: A5-CS015-0006-01
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	: 6.995E+002 GWET
Sample Taken On	: 12/13/2016 9:15:00 AM
Acquisition Started	: 12/15/2016 1:17:02 PM
Live Time	: 7200.0 seconds
Real Time	: 7201.8 seconds
Dead Time	: 0.02 %

Energy Calibration Used Done On	: 12/10/2016
Efficiency Calibration Used Done On	: 9/27/2016
Efficiency ID	: ERT0101

****
***** P E A K A N A L Y S I S R E P O R T *****
****

Detector Name: ERT01
Sample Title: A5-CS015-0006-01
Peak Analysis Performed on: 12/15/2016 3:17:05 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	291-	318	299.95	75.02	0.95	2.45E+002	23.21	4.50E+002
m	2	291-	318	309.21	77.33	0.96	4.14E+002	27.55	4.11E+002
M	3	344-	377	348.92	87.26	1.14	1.56E+002	22.11	4.29E+002
m	4	344-	377	359.50	89.90	1.15	1.07E+002	20.20	5.20E+002
m	5	344-	377	372.09	93.05	1.15	2.19E+002	24.00	4.33E+002
	6	735-	752	744.12	186.06	1.02	2.81E+002	40.26	4.12E+002
M	7	948-	974	954.45	238.65	1.11	1.20E+003	38.65	2.84E+002
m	8	948-	974	966.70	241.71	1.11	2.12E+002	19.75	2.81E+002
	9	1075-	1086	1081.41	270.39	0.97	7.72E+001	21.79	1.59E+002
	10	1173-	1188	1180.49	295.16	1.07	3.52E+002	30.60	1.94E+002
	11	1194-	1207	1199.87	300.00	0.45	6.14E+001	24.23	1.90E+002
	12	1308-	1317	1311.78	327.98	0.51	3.71E+001	17.51	1.18E+002
	13	1343-	1358	1352.88	338.26	1.15	2.29E+002	27.14	1.69E+002
	14	1400-	1416	1407.46	351.90	1.26	6.53E+002	33.76	1.56E+002
	15	1845-	1858	1851.18	462.84	0.72	6.33E+001	17.44	8.67E+001
	16	2032-	2055	2042.01	510.55	1.71	3.11E+002	29.14	1.34E+002
	17	2321-	2340	2331.72	582.98	1.32	3.97E+002	27.83	1.06E+002
	18	2427-	2443	2436.08	609.07	1.35	5.04E+002	28.46	9.85E+001
	19	2903-	2919	2908.35	727.14	0.89	7.30E+001	17.60	7.40E+001
	20	3173-	3183	3177.51	794.43	1.20	3.23E+001	12.27	4.87E+001
	21	3435-	3450	3441.59	860.46	0.56	4.85E+001	15.22	6.05E+001
	22	3634-	3654	3643.66	910.98	1.36	3.19E+002	23.55	6.40E+001
M	23	3851-	3884	3857.91	964.54	1.48	8.37E+001	10.73	3.81E+001
m	24	3851-	3884	3874.32	968.64	1.48	2.14E+002	16.23	5.22E+001
	25	4338-	4349	4343.70	1085.99	0.25	8.67E+000	9.29	3.03E+001
	26	4471-	4491	4480.43	1120.18	1.25	1.45E+002	19.30	6.27E+001
	27	4559-	4570	4564.70	1141.25	0.58	1.53E+001	8.97	2.57E+001
	28	5504-	5516	5510.16	1377.62	0.42	1.85E+001	8.36	1.95E+001
	29	5830-	5854	5843.69	1461.00	1.81	1.52E+003	41.52	4.76E+001
	30	7051-	7071	7061.18	1765.39	0.84	9.09E+001	10.76	7.15E+000

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: A5-CS015-0006-01
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	6.3240E-001	6.32E-001	1.3211E+001
	Co-60	1173.23	99.85	6.8993E-002	5.72E-002	-2.8537E-003
		1332.49	99.98	5.7187E-002		-4.6039E-003
>		2505.71	0.10	0.0000E+000		0.0000E+000
	Cs-137	32.06	5.54	8.0704E+002	6.07E-002	1.7697E+002
		661.66	84.99	6.0692E-002		2.0140E-002
+	Tl-208	72.80	2.02	5.9598E+000	5.50E-002	-3.2781E-001
		74.97*	3.41	2.0301E+000		3.5052E+000
		84.90	1.51	4.8797E+000		-9.2253E-001
		277.36	6.31	6.6612E-001		4.0908E-001
		510.77*	22.60	2.5595E-001		2.7820E-001
		583.19*	84.50	5.4960E-002		2.2630E-001
		763.13	1.81	3.1213E+000		3.8775E-003
		860.56*	12.42	3.4160E-001		2.5270E-001
+	Bi-212	39.86	1.06	4.2539E+002	6.33E-001	5.8968E+001
		727.33*	6.74	6.3307E-001		6.2281E-001
		785.37	1.11	4.9572E+000		1.1158E+000
		1620.74	1.51	3.0271E+000		1.9115E+000
		1806.00	0.09	3.6705E+001		-1.2591E+001
+	Pb-212	74.81*	10.40	6.6564E-001	7.31E-002	1.1493E+000
		77.11*	17.50	3.4157E-001		1.0398E+000
		87.30*	7.81	5.6449E-001		6.3505E-001
		115.18	0.59	7.8348E+000		2.4939E+000
		238.63*	43.30	7.3076E-002		7.3957E-001
		300.09*	3.28	1.0264E+000		5.7599E-001
+	Bi-214	76.86*	0.43	1.4002E+001	9.34E-002	4.2621E+001
		89.81*	0.24	1.8663E+001		1.3033E+001
		386.77	0.30	1.4690E+001		2.6140E+000
		454.77	0.29	1.4723E+001		4.9093E+000
		609.31*	45.49	9.3437E-002		5.5930E-001
		665.45	1.53	3.4493E+000		8.9713E-001
		703.11	0.48	1.0942E+001		7.9644E+000
		719.86	0.39	1.2743E+001		-3.0763E+000
		768.36	4.89	1.2272E+000		6.7706E-001
		786.10	0.31	1.7723E+001		1.0281E+001
		806.17	1.26	4.0934E+000		1.1443E+000
		934.06	3.10	1.9138E+000		7.7420E-001
		964.08*	0.36	8.3264E+000		1.6092E+001
		1051.96	0.31	1.9620E+001		-6.1487E+000
		1120.29*	14.91	3.7694E-001		7.5255E-001

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GWET)	Nuclide MDA (pCi/GWET)	Activity (pCi/GWET)
+	Bi-214	1133.66	0.25	2.5347E+001	9.34E-002	2.2487E+000
		1155.19	1.63	4.4897E+000		2.6046E+000
		1207.68	0.45	1.6292E+001		2.1433E+000
		1238.11	5.79	1.4802E+000		7.1687E-001
		1280.96	1.43	4.4722E+000		-1.7272E+000
		1377.67*	4.00	8.0033E-001		4.1179E-001
		1385.31	0.76	6.3703E+000		-6.9962E+000
		1401.50	1.27	4.4327E+000		1.0044E+000
		1407.98	2.15	2.5498E+000		-1.2511E+000
		1509.23	2.11	2.3870E+000		4.8157E-001
		1538.50	0.38	1.1563E+001		-1.0067E+000
		1543.32	0.20	2.3200E+001		-8.7715E+000
		1583.22	0.69	7.8465E+000		5.2094E+000
		1594.73	0.25	2.3477E+001		5.2534E+000
		1599.31	0.23	2.1486E+001		1.1663E+001
		1661.28	1.15	3.9021E+000		5.6483E-001
		1683.99	0.22	1.9443E+001		-6.3097E+000
		1729.59	2.92	1.8229E+000		4.0185E-001
		1764.49*	15.40	2.0025E-001		5.8836E-001
		1847.42	2.11	2.2998E+000		-8.2931E-001
		1873.16	0.22	1.5858E+001		-8.8120E+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	3.7641E+001	9.71E-002	-3.4679E+000
		74.81*	6.44	1.0726E+000		1.8520E+000
		77.11*	10.80	5.5229E-001		1.6812E+000
		87.30*	4.84	9.0893E-001		1.0225E+000
		242.00*	7.43	4.1326E-001		7.7621E-001
		258.87	0.52	7.6318E+000		-2.7681E-001
		274.80	0.47	8.7536E+000		-3.6423E+000
		295.22*	19.30	1.8147E-001		5.5455E-001
		351.93*	37.60	9.7060E-002		5.8616E-001
		462.00*	0.22	1.4021E+001		1.1864E+001
		533.66	0.19	2.5234E+001		2.5116E-001
		785.96	1.07	5.1203E+000		2.6142E+000
		839.04	0.59	1.0159E+001		7.6680E+000
+	Ra-224	81.07	0.13	5.9719E+001	7.51E-001	-8.9959E+000
		83.78	0.22	3.3458E+001		4.0755E+000
		240.99*	4.10	7.5051E-001		1.4097E+000
+	Ra-226	81.07	0.20	3.9626E+001	1.22E+000	-5.9692E+000
		83.78	0.33	2.2088E+001		2.6905E+000
		94.90	0.15	3.8749E+001		-3.3292E+001
		186.21*	3.59	1.2162E+000		1.5843E+000
+	Ac-228	99.50	1.26	3.8096E+000	1.94E-001	1.3803E+000
		129.07	2.50	1.8123E+000		4.5556E-001
		209.25	3.97	1.1587E+000		5.7429E-001
		270.24*	3.55	7.7784E-001		6.2892E-001
		328.00*	3.04	8.4797E-001		3.9805E-001
		338.32*	11.40	3.1379E-001		6.6748E-001
		409.46	2.02	2.2286E+000		3.1370E-001

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GWET)	Nuclide MDA (pCi/GWET)	Activity (pCi/GWET)
+	Ac-228	463.00*	4.45	6.9785E-001	1.94E-001	5.9045E-001
		755.31	1.03	4.8780E+000		1.6830E+000
		772.29	1.52	3.7481E+000		2.2558E+000
		794.94*	4.31	7.5624E-001		4.5792E-001
		835.70	1.70	3.4613E+000		1.3311E-001
		911.20*	26.20	1.9378E-001		8.0512E-001
		964.79*	4.99	6.0701E-001		1.1732E+000
		968.96*	15.90	2.2153E-001		9.4329E-001
		1588.20	3.06	1.9647E+000		5.9511E-001
		1630.62	1.52	3.1177E+000		3.1302E-001
	Th-228	84.37	1.26	5.8379E+000	5.84E+000	9.0360E-003
		131.61	0.13	3.4404E+001		2.4041E+001
		166.41	0.10	4.2463E+001		2.5464E-001
		215.98	0.25	1.6586E+001		-9.3255E-001
	Pa-234m	258.23	0.07	5.4878E+001	7.21E+000	3.6603E+001
		742.81	0.09	5.2876E+001		-1.7666E+001
		766.36	0.32	1.8674E+001		1.0426E+001
		786.27	0.05	1.0252E+002		5.9472E+001
		1001.03	0.85	7.2114E+000		-1.2502E+000
		1737.77	0.02	2.0079E+002		-1.7312E+002
	Th-234	63.30	3.75	4.9759E+000	1.48E+000	3.7841E-001
		92.59	4.33	1.4764E+000		-2.7834E-002
		112.81	0.22	2.1244E+001		-3.5572E+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: A5-CS015-0006-01
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	0.995	1460.82*		10.55	1.32114E+001	5.06150E-001
Eu-152m	0.999	89.85*		69.90	4.55092E-002	8.75703E-003
Tl-208	0.835	72.80	@	2.02		
		74.97*	@	3.41	3.50522E+000	3.53056E-001
		84.90	@	1.51		
		277.36		6.31		
		510.77*	@	22.60	2.78203E-001	5.95190E-002
		583.19*		84.50	2.26296E-001	1.78065E-002
		763.13	@	1.81		
		860.56*		12.42	2.52696E-001	7.94663E-002
Bi-211	0.885	351.03*		13.00	1.69568E+000	1.12638E-001
Bi-212	0.570	39.86	@	1.06		
		727.33*		6.74	6.22815E-001	1.51339E-001
		785.37		1.11		
		1620.74		1.51		
		1806.00	@	0.09		
Pb-212	0.984	74.81*		10.40	1.14931E+000	1.20416E-001
		77.11*		17.50	1.03976E+000	8.35385E-002
		87.30*		7.81	6.35052E-001	9.45306E-002
		115.18	@	0.59		
		238.63*		43.30	7.39571E-001	4.11893E-002
		300.09*		3.28	5.75994E-001	2.28699E-001
Bi-214	0.530	76.86*	@	0.43	4.26213E+001	3.45472E+000
		89.81*	@	0.24	1.30333E+001	2.55113E+000
		386.77	@	0.30		
		454.77	@	0.29		
		609.31*		45.49	5.59300E-001	3.59532E-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	1.60925E+001	2.16285E+000
		1051.96	@	0.31		
		1120.29*		14.91	7.52545E-001	1.01637E-001
		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	0.530	1280.96	@	1.43		
		1377.67*		4.00	4.11789E-001	1.86071E-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	5.88363E-001	7.74123E-002
		1847.42	@	2.11		
		1873.16	@	0.22		
		2118.55	@	1.14		
		2204.21	@	5.08		
Pb-214	0.945	53.28	@	1.20		
		74.81*		6.44	1.85204E+000	1.96075E-001
		77.11*		10.80	1.68117E+000	1.40764E-001
		87.30*		4.84	1.02254E+000	1.53437E-001
		242.00*		7.43	7.76214E-001	8.07120E-002
		258.87	@	0.52		
		274.80	@	0.47		
		295.22*		19.30	5.54551E-001	5.34806E-002
		351.93*		37.60	5.86162E-001	3.84909E-002
		462.00*	@	0.22	1.18636E+001	3.32842E+000
		533.66	@	0.19		
		785.96	@	1.07		
		839.04	@	0.59		
Ra-224	0.816	81.07	@	0.13		
		83.78	@	0.22		
		240.99*		4.10	1.40968E+000	1.46102E-001
Ra-226	0.776	81.07	@	0.20		
		83.78	@	0.33		
		94.90	@	0.15		
		186.21*		3.59	1.58434E+000	2.87616E-001
Ac-228	0.638	99.50	@	1.26		
		129.07	@	2.50		
		209.25		3.97		
		270.24*		3.55	6.28917E-001	1.80415E-001
		328.00*		3.04	3.98051E-001	1.89023E-001
		338.32*		11.40	6.67481E-001	8.65059E-002
		409.46	@	2.02		
		463.00*		4.45	5.90446E-001	1.66965E-001
		755.31	@	1.03		
		772.29	@	1.52		
		794.94*		4.31	4.57915E-001	1.75132E-001

Nuclide Name	Id Confidence	Energy (keV)		Yield (%)	Activity (pCi/GWET)	Activity Uncertainty
Ac-228	0.638	835.70	@	1.70		
		911.20*		26.20	8.05122E-001	6.80853E-002
		964.79*		4.99	1.17317E+000	1.57971E-001
		968.96*		15.90	9.43285E-001	8.05707E-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 *****
****

	Nuclide Name		Nuclide Id Confidence	Wt mean Activity (pCi/GWET)	Wt mean Activity Uncertainty
	K-40		0.995	1.321135E+001	5.061496E-001
X	Cd-109		0.909		
	Eu-152m		0.999	4.348923E-002	8.748966E-003
	Tl-208	@	0.835	2.281296E-001	1.726482E-002
	Bi-211		0.885	2.522732E-001	1.762205E-001
	Bi-212	@	0.570	6.228149E-001	1.513390E-001
	Pb-212	@	0.984	6.849894E-001	3.367378E-002
	Bi-214	@	0.530	5.785005E-001	3.055037E-002
	Pb-214	@	0.945	4.989557E-001	4.762449E-002
	Ra-224	@	0.816	5.035270E-001	1.689111E-001
	Ra-226	@	0.776	1.584345E+000	2.876162E-001
	Ac-228	@	0.638	7.801796E-001	3.669887E-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: 12/15/2016 3:17:05 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
m	5	93.05	1.9819E-002	17.33	Tol.	Yb-169 Th-227 Th-234
	25	1085.99	1.2037E-003	107.21	Tol.	Eu-152
	27	1141.25	2.1265E-003	58.60		

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

Errors quoted at 1.000 sigma