Date: 9/22 - 9/23

9626 Niagara Falls Blvd Onsite Gamma Spec Screening Lab

Gamma Spectroscopy Detector work sheet.

Counted by (Initial,date)	Geometry Description	SMP- Analysis Number/Sample ID/Remarks	Sample Collection mmddyy hh:mm	Sample Quantity	Sample Units (GWET,GDRY,L, ft^3, etc)	Count Time (s)	Report Matches Sample Parameters (Initial, date)
✓ DJK 9/27/16	450 cc SOIL	N002-OF-AB05-01-01	9/22/2016 14:20	491.9	g DRY	7200	DJK 9/27/16
✓ DJK 9/27/16	450 cc SOIL	N002-OF-AD02-01-01	9/23/2016 09:50	683.6	g DRY	7200	DJK 9/28/16
✓ DJK 9/27/16	450 cc SOIL	N002-OF-AF11-01-01	9/22/2016 16:00	726.1	g DRY	7200	DJK 9/28/16
✓ DJK 9/28/16	450 cc SOIL	N002-OF-AM13-01-01	9/23/2016 10:20	542.7	g DRY	7200	DJK 9/28/16
✓ DJK 9/28/16	450 cc SOIL	N002-OF-AH13-02-01	9/23/2016 10:00	536.3	g DRY	7200	DJK 9/28/16
✓ DJK 9/28/16	450 cc SOIL	N002-OF-AB05-01-01 DUP	9/22/16 14:20	455.0	g DRY	7200	DJK 9/29/16
✓ DJK 9/28/16	450 cc SOIL	N002-OF-AB05-01-02	9/22/16 14:40	438.2	g DRY	7200	DJK 9/29/16
	450 cc SOIL					7200	
	450 cc SOIL					7200	
	450 cc SOIL					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

DJK 9/29/16

Report Generated On	:	9/28/2016 7:17:35 PM
Sample Title	:	N002-OF-AB05-01-01D
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	:	4.550E+002 GDRY
Sample Taken On	:	9/22/2016 2:20:00 PM
Acquisition Started	:	9/28/2016 5:17:32 PM
Live Time	:	7200.0 seconds
Real Time	:	7202.5 seconds
Dead Time	:	0.03 %

Energy Calibration Used Done On	:	9/27/2016
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 *****
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Detector Name: ERT01
Sample Title: N002-OF-AB05-01-01D
Peak Analysis Performed on: 9/28/2016 7:17:35 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	296-	313	299.62	74.92	0.82	1.73E+002	19.09	3.08E+002
m	2	296-	313	308.92	77.25	0.83	3.37E+002	22.70	3.54E+002
	3	344-	354	349.39	87.37	0.98	9.99E+001	29.84	3.30E+002
	4	365-	381	371.38	92.87	1.39	2.05E+002	40.07	4.47E+002
	5	513-	521	516.86	129.26	0.63	5.70E+001	21.25	1.84E+002
	6	739-	750	743.88	186.05	1.02	1.97E+002	27.31	2.17E+002
	7	828-	843	836.38	209.19	0.67	9.49E+001	28.80	2.44E+002
M	8	946-	978	954.18	238.65	1.10	9.35E+002	31.99	2.26E+002
m	9	946-	978	966.66	241.78	1.10	2.40E+002	18.04	2.14E+002
	10	1173-	1186	1180.19	295.19	1.04	3.06E+002	26.29	1.40E+002
	11	1197-	1204	1200.10	300.17	0.74	4.43E+001	14.49	8.17E+001
	12	1303-	1319	1311.17	327.95	0.79	5.45E+001	22.50	1.45E+002
	13	1343-	1358	1352.54	338.30	1.19	2.05E+002	24.22	1.27E+002
	14	1399-	1417	1406.72	351.85	1.16	5.30E+002	33.86	1.79E+002
	15	1631-	1641	1636.44	409.32	0.53	1.94E+001	14.46	7.96E+001
	16	1846-	1860	1850.29	462.81	0.43	1.60E+001	17.74	1.02E+002
	17	2034-	2054	2041.87	510.73	1.25	2.64E+002	25.34	1.05E+002
	18	2321-	2339	2330.98	583.05	1.45	3.49E+002	24.61	7.58E+001
	19	2426-	2443	2435.44	609.18	1.49	4.15E+002	25.74	7.64E+001
	20	2899-	2914	2906.12	726.91	0.60	5.57E+001	16.56	7.23E+001
	21	3633-	3652	3642.38	911.08	1.48	2.24E+002	20.68	5.77E+001
	22	3727-	3741	3734.50	934.13	0.88	3.59E+001	10.82	2.71E+001
M	23	3849-	3882	3856.22	964.57	1.72	4.46E+001	8.93	4.42E+001
m	24	3849-	3882	3873.71	968.95	1.72	1.40E+002	13.22	4.93E+001
	25	4470-	4487	4478.80	1120.31	0.35	9.15E+001	14.94	4.05E+001
	26	4944-	4955	4949.48	1238.04	0.34	4.07E+001	11.54	3.63E+001
	27	5827-	5854	5841.61	1461.20	1.78	1.12E+003	35.08	2.46E+001
	28	7049-	7066	7057.97	1765.46	1.42	8.98E+001	11.24	1.12E+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: N002-OF-AB05-01-01D
Nuclide Library Used: C:\GENIE2K\CAMFILES\ERT_LIBRARY_LMDA.NLB

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GDRY)	Nuclide MDA (pCi/GDRY)	Activity (pCi/GDRY)
+	K-40	1460.82*	10.55	7.6350E-001	7.64E-001	1.4852E+001
	Co-60	1173.23	99.85	9.3347E-002	7.73E-002	-2.3509E-002
		1332.49	99.98	7.7260E-002		8.3645E-003
>		2505.71	0.10	0.0000E+000		0.0000E+000
	Cs-137	32.06	5.54	1.1106E+003	8.36E-002	1.1655E+002
		661.66	84.99	8.3603E-002		-2.9428E-002
+	Tl-208	72.80	2.02	8.2052E+000	7.08E-002	-8.1942E+000
		74.97*	3.41	2.6123E+000		3.8396E+000
		84.90	1.51	6.6036E+000		-4.4304E-001
		277.36	6.31	9.2925E-001		6.6261E-001
		510.77*	22.60	3.5099E-001		2.8795E-001
		583.19*	84.50	7.0827E-002		3.0681E-001
		763.13	1.81	4.1248E+000		-4.3334E+000
		860.56	12.42	6.5136E-001		2.3678E-001
+	Bi-212	39.86	1.06	5.7578E+002	9.40E-001	-2.3091E+002
		727.33*	6.74	9.4006E-001		7.3253E-001
		785.37	1.11	7.0458E+000		5.7920E+000
		1620.74	1.51	4.8720E+000		-7.9707E-002
		1806.00	0.09	6.9416E+001		1.1055E+001
+	Pb-212	74.81*	10.40	8.5655E-001	1.02E-001	1.2589E+000
		77.11*	17.50	4.9161E-001		1.3088E+000
		87.30*	7.81	8.3505E-001		6.2532E-001
		115.18	0.59	1.0277E+001		3.2408E+000
		238.63*	43.30	1.0167E-001		8.8141E-001
		300.09*	3.28	9.0677E-001		6.4276E-001
+	Bi-214	76.86*	0.43	2.0073E+001	1.30E-001	5.3440E+001
		89.81	0.24	3.8696E+001		9.9873E+000
		386.77	0.30	1.9778E+001		-4.1975E+000
		454.77	0.29	2.0266E+001		-5.9815E+000
		609.31*	45.49	1.2971E-001		7.0819E-001
		665.45	1.53	4.7722E+000		1.3767E+000
		703.11	0.48	1.5624E+001		7.4231E+000
		719.86	0.39	1.8545E+001		2.4170E+000
		768.36	4.89	1.6900E+000		1.3935E+000
		786.10	0.31	2.3855E+001		-8.0401E+000
		806.17	1.26	5.8568E+000		1.8269E+000
		934.06*	3.10	1.5098E+000		1.2163E+000
		964.08*	0.36	1.3715E+001		1.3178E+001
		1051.96	0.31	2.5431E+001		-1.1789E+001
		1120.29*	14.91	4.4656E-001		7.2852E-001

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GDRY)	Nuclide MDA (pCi/GDRY)	Activity (pCi/GDRY)
+	Bi-214	1133.66	0.25	3.4356E+001	1.30E-001	3.9694E+000
		1155.19	1.63	5.6726E+000		1.6289E+000
		1207.68	0.45	2.2754E+001		5.2406E+000
		1238.11*	5.79	1.0406E+000		8.9295E-001
		1280.96	1.43	5.8852E+000		-9.1404E-002
		1377.67	4.00	2.0112E+000		6.5513E-001
		1385.31	0.76	9.1620E+000		-5.9377E+000
		1401.50	1.27	6.0200E+000		-7.3150E+000
		1407.98	2.15	3.6199E+000		6.0481E-001
		1509.23	2.11	3.3283E+000		3.0166E-002
		1538.50	0.38	1.7776E+001		-4.5099E+000
		1543.32	0.20	3.4598E+001		9.3882E+000
		1583.22	0.69	1.1031E+001		6.7260E+000
		1594.73	0.25	3.4204E+001		1.3526E+001
		1599.31	0.23	3.2117E+001		2.3226E+001
		1661.28	1.15	5.5595E+000		8.8020E-001
		1683.99	0.22	2.6851E+001		9.6469E+000
		1729.59	2.92	2.5981E+000		5.5153E-001
		1764.49*	15.40	3.5422E-001		8.9293E-001
		1847.42	2.11	3.0909E+000		2.4209E-001
		1873.16	0.22	2.8658E+001		-2.6118E+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	5.1625E+001	1.67E-001	-8.3369E+000
		74.81*	6.44	1.3749E+000		2.0208E+000
		77.11*	10.80	7.9177E-001		2.1079E+000
		87.30*	4.84	1.3393E+000		1.0029E+000
		242.00*	7.43	5.5705E-001		1.3532E+000
		258.87	0.52	1.0584E+001		-1.0798E+000
		274.80	0.47	1.2374E+001		-1.4388E+001
		295.22*	19.30	2.2770E-001		7.4166E-001
		351.93*	37.60	1.6686E-001		7.3007E-001
		462.00*	0.22	2.3933E+001		4.5950E+000
		533.66	0.19	3.4788E+001		-1.0262E+001
		785.96	1.07	6.9104E+000		-2.3291E+000
		839.04	0.59	1.3732E+001		5.9181E+000
+	Ra-224	81.07	0.13	7.6624E+001	1.02E+000	-1.7416E+002
		83.78	0.22	4.3951E+001		5.7165E+000
		240.99*	4.10	1.0156E+000		2.4673E+000
+	Ra-226	81.07	0.20	5.0645E+001	1.25E+000	-1.1511E+002
		83.78	0.33	2.8901E+001		3.7591E+000
		94.90	0.15	5.4078E+001		-1.0884E+001
		186.21*	3.59	1.2516E+000		1.5468E+000
+	Ac-228	99.50	1.26	5.0213E+000	2.79E-001	2.3583E-001
		129.07*	2.50	1.4406E+000		8.6392E-001
		209.25*	3.97	1.2795E+000		9.4332E-001
		270.24	3.55	1.6903E+000		8.0205E-001
		328.00*	3.04	1.6805E+000		9.0213E-001
		338.32*	11.40	4.2170E-001		9.2215E-001
		409.46*	2.02	1.9377E+000		5.6193E-001

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GDRY)	Nuclide MDA (pCi/GDRY)	Activity (pCi/GDRY)
+	Ac-228	463.00*	4.45	1.1958E+000	2.79E-001	2.2959E-001
		755.31	1.03	6.8469E+000		-3.3670E-001
		772.29	1.52	5.3393E+000		2.6790E+000
		794.94	4.31	1.8591E+000		6.5651E-001
		835.70	1.70	4.5832E+000		-3.6706E+000
		911.20*	26.20	2.7931E-001		8.6748E-001
		964.79*	4.99	1.0038E+000		9.6448E-001
		968.96*	15.90	3.3265E-001		9.5485E-001
		1588.20	3.06	2.7832E+000		1.2331E+000
		1630.62	1.52	4.5057E+000		-2.1587E+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 *****
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Sample Title: N002-OF-AB05-01-01D
Nuclide Library Used: C:\GENIE2K\CAMFILES\ERT_LIBRARY_LMDA.NLB

..... IDENTIFIED NUCLIDES .....

Nuclide Name	Id Confidence	Energy (keV)		Yield (%)	Activity (pCi/GDRY)	Activity Uncertainty
K-40	0.977	1460.82*		10.55	1.48516E+001	6.16743E-001
Tl-208	0.711	72.80	@	2.02		
		74.97*	@	3.41	3.83956E+000	4.42937E-001
		84.90	@	1.51		
		277.36		6.31		
		510.77*	@	22.60	2.87949E-001	8.00324E-002
		583.19*		84.50	3.06812E-001	2.42967E-002
		763.13	@	1.81		
		860.56		12.42		
Bi-211	0.897	351.03*		13.00	2.11271E+000	1.61976E-001
Bi-212	0.556	39.86	@	1.06		
		727.33*		6.74	7.32532E-001	2.19090E-001
		785.37		1.11		
		1620.74		1.51		
		1806.00	@	0.09		
Pb-212	0.986	74.81*		10.40	1.25893E+000	1.49704E-001
		77.11*		17.50	1.30880E+000	1.06172E-001
		87.30*		7.81	6.25324E-001	1.88931E-001
		115.18	@	0.59		
		238.63*		43.30	8.81411E-001	5.03777E-002
		300.09*		3.28	6.42756E-001	2.11704E-001
Bi-214	0.588	76.86*	@	0.43	5.34396E+001	4.37281E+000
		89.81	@	0.24		
		386.77	@	0.30		
		454.77	@	0.29		
		609.31*		45.49	7.08185E-001	4.90214E-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	1.21632E+000	3.67413E-001
		964.08*	@	0.36	1.31780E+001	2.69325E+000
		1051.96	@	0.31		
		1120.29*		14.91	7.28520E-001	1.20307E-001
		1133.66	@	0.25		
		1155.19	@	1.63		
		1207.68	@	0.45		
		1238.11*		5.79	8.92952E-001	2.54477E-001
		1280.96	@	1.43		

Nuclide Name	Id Confidence	Energy (keV)		Yield (%)	Activity (pCi/GDRY)	Activity Uncertainty
Bi-214	0.588	1377.67		4.00		
		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	8.92932E-001	1.23746E-001
		1847.42	@	2.11		
		1873.16	@	0.22		
		2118.55	@	1.14		
		2204.21	@	5.08		
Pb-214	0.946	53.28	@	1.20		
		74.81*		6.44	2.02075E+000	2.42251E-001
		77.11*		10.80	2.10790E+000	1.78066E-001
		87.30*		4.84	1.00294E+000	3.03615E-001
		242.00*		7.43	1.35325E+000	1.19259E-001
		258.87	@	0.52		
		274.80	@	0.47		
		295.22*		19.30	7.41658E-001	7.08068E-002
		351.93*		37.60	7.30074E-001	5.54926E-002
		462.00*	@	0.22	4.59496E+000	5.11616E+000
		533.66	@	0.19		
		785.96	@	1.07		
		839.04	@	0.59		
Ra-224	0.802	81.07	@	0.13		
		83.78	@	0.22		
		240.99*		4.10	2.46728E+000	2.16448E-001
Ra-226	0.776	81.07	@	0.20		
		83.78	@	0.33		
		94.90	@	0.15		
		186.21*		3.59	1.54675E+000	3.01238E-001
Ac-228	0.695	99.50	@	1.26		
		129.07*	@	2.50	8.63922E-001	3.23941E-001
		209.25*		3.97	9.43321E-001	2.91046E-001
		270.24		3.55		
		328.00*		3.04	9.02131E-001	3.75447E-001
		338.32*		11.40	9.22150E-001	1.19225E-001
		409.46*	@	2.02	5.61934E-001	4.20533E-001
		463.00*		4.45	2.29588E-001	2.55759E-001
		755.31	@	1.03		
		772.29	@	1.52		
		794.94		4.31		
		835.70	@	1.70		

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/GDRY)	Activity Uncertainty
Ac-228	0.695	911.20*	26.20	8.67477E-001	8.87749E-002
		964.79*	4.99	9.64477E-001	1.97275E-001
		968.96*	15.90	9.54849E-001	9.74996E-002
		1588.20	3.06		
		1630.62 @	1.52		
Th-234	0.451	63.30	3.75		
		92.59*	4.33	1.29543E+000	4.11826E-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

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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/GDRY)	Wt mean Activity Uncertainty
	K-40		0.977	1.485161E+001	6.167426E-001
X	Cd-109		0.933		
	Tl-208	@	0.711	3.059645E-001	2.413161E-002
	Bi-211		0.897	1.362481E-001	2.423802E-001
	Bi-212	@	0.556	7.325321E-001	2.190898E-001
	Pb-212	@	0.986	8.264557E-001	4.229442E-002
	Bi-214	@	0.588	7.435477E-001	4.167757E-002
	Pb-214	@	0.946	6.829920E-001	6.321569E-002
	Ra-224	@	0.802	1.222032E+000	2.433690E-001
	Ra-226	@	0.776	1.546752E+000	3.012380E-001
	Ac-228	@	0.695	8.835039E-001	5.048962E-002
	Th-234	@	0.451	1.295430E+000	4.118258E-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: 9/28/2016 7:17:35 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

All peaks were identified.

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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

DK 9/29/16

Report Generated On	:	9/28/2016 9:34:33 PM
Sample Title	:	N002-OF-AB05-01-02D
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	:	4.382E+002 GDRY
Sample Taken On	:	9/22/2016 2:20:00 PM
Acquisition Started	:	9/28/2016 7:34:30 PM
Live Time	:	7200.0 seconds
Real Time	:	7202.8 seconds
Dead Time	:	0.04 %

Energy Calibration Used Done On	:	9/27/2016
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: N002-OF-AB05-01-02D
Peak Analysis Performed on: 9/28/2016 9:34:33 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	248-	262	253.54	63.40	0.50	5.79E+001	33.24	3.61E+002
M	2	292-	315	299.60	74.92	0.87	1.75E+002	18.37	3.60E+002
m	3	292-	315	308.98	77.26	0.88	3.75E+002	23.47	3.61E+002
	4	344-	355	349.48	87.40	0.47	1.02E+001	32.12	4.06E+002
	5	365-	382	371.82	92.98	1.30	1.99E+002	41.84	4.75E+002
	6	735-	752	743.82	186.04	1.30	2.35E+002	35.40	3.12E+002
	7	833-	842	836.71	209.27	1.15	6.20E+001	20.57	1.58E+002
M	8	945-	973	954.33	238.69	1.07	9.31E+002	32.15	2.35E+002
m	9	945-	973	966.05	241.63	1.07	1.59E+002	15.93	2.12E+002
	10	1172-	1186	1179.98	295.14	1.27	3.50E+002	27.96	1.50E+002
	11	1192-	1205	1200.01	300.15	1.34	8.68E+001	20.71	1.24E+002
	12	1305-	1316	1310.85	327.87	0.60	3.61E+001	17.25	1.04E+002
	13	1345-	1360	1352.26	338.23	1.27	1.81E+002	24.21	1.33E+002
	14	1400-	1415	1406.83	351.88	1.08	6.07E+002	29.31	8.41E+001
	15	1845-	1855	1850.56	462.87	1.08	5.43E+001	13.79	5.58E+001
	16	2028-	2053	2041.15	510.55	1.39	2.57E+002	27.89	1.23E+002
	17	2325-	2338	2330.99	583.05	1.21	3.12E+002	21.40	5.30E+001
	18	2426-	2443	2435.34	609.15	1.28	4.40E+002	26.81	8.56E+001
	19	2900-	2914	2907.07	727.15	1.18	6.99E+001	13.29	3.71E+001
	20	3121-	3131	3126.18	781.96	0.32	1.13E+001	6.63	1.38E+001
	21	3172-	3185	3178.88	795.14	0.70	4.39E+001	11.54	3.21E+001
	22	3632-	3651	3642.81	911.19	1.56	2.45E+002	19.38	3.75E+001
	23	3865-	3881	3873.34	968.86	0.66	1.19E+002	16.87	5.29E+001
	24	4471-	4487	4478.49	1120.23	0.69	9.95E+001	15.34	4.35E+001
	25	5830-	5854	5841.58	1461.19	1.75	1.00E+003	33.44	2.79E+001
	26	7049-	7066	7058.08	1765.49	0.73	7.72E+001	9.97	6.77E+000

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 *****
****

Detector Name: ERT01
Sample Geometry:
Sample Title: N002-OF-AB05-01-02D
Nuclide Library Used: C:\GENIE2K\CAMFILES\ERT_LIBRARY_LMDA.NLB

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GDRY)	Nuclide MDA (pCi/GDRY)	Activity (pCi/GDRY)
+	K-40	1460.82*	10.55	8.0288E-001	8.03E-001	1.3793E+001
	Co-60	1173.23	99.85	9.6172E-002	8.18E-002	3.8245E-002
		1332.49	99.98	8.1846E-002		4.7477E-002
>		2505.71	0.10	0.0000E+000		0.0000E+000
	Cs-137	32.06	5.54	1.1925E+003	8.14E-002	4.7791E+002
		661.66	84.99	8.1414E-002		3.3359E-002
+	Tl-208	72.80	2.02	8.4148E+000	5.71E-002	6.4118E-001
		74.97*	3.41	2.9303E+000		4.0168E+000
		84.90	1.51	6.8244E+000		1.2343E+000
		277.36	6.31	9.2064E-001		1.9978E-001
		510.77*	22.60	4.0542E-001		2.7645E-001
		583.19*	84.50	5.7089E-002		2.8395E-001
		763.13	1.81	4.2978E+000		-1.4842E+000
		860.56	12.42	6.6945E-001		4.2371E-001
+	Bi-212	39.86	1.06	5.9857E+002	6.94E-001	4.7945E+001
		727.33*	6.74	6.9408E-001		9.5493E-001
		785.37	1.11	6.7297E+000		3.0443E+000
		1620.74	1.51	4.6342E+000		-2.3574E+000
		1806.00	0.09	7.6702E+001		6.7266E+000
+	Pb-212	74.81*	10.40	9.6079E-001	1.07E-001	1.3171E+000
		77.11*	17.50	5.1533E-001		1.5144E+000
		87.30*	7.81	9.8268E-001		6.5952E-002
		115.18	0.59	1.0348E+001		3.1784E+000
		238.63*	43.30	1.0737E-001		9.1120E-001
		300.09*	3.28	1.3350E+000		1.3061E+000
+	Bi-214	76.86*	0.43	2.1040E+001	1.42E-001	6.1830E+001
		89.81	0.24	3.9379E+001		1.1359E+001
		386.77	0.30	2.1112E+001		2.0966E+000
		454.77	0.29	2.1151E+001		4.1698E+000
		609.31*	45.49	1.4243E-001		7.8097E-001
		665.45	1.53	4.5703E+000		8.3006E-001
		703.11	0.48	1.5687E+001		-8.5897E+000
		719.86	0.39	1.8300E+001		-2.0881E+000
		768.36	4.89	1.7306E+000		9.5962E-001
		786.10	0.31	2.4325E+001		1.2595E+001
		806.17	1.26	6.0589E+000		-4.9163E-001
		934.06	3.10	2.5952E+000		1.7103E+000
		964.08	0.36	3.3037E+001		-8.1524E+000
		1051.96	0.31	2.6644E+001		-1.0862E+001
		1120.29*	14.91	4.7040E-001		8.2216E-001

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GDRY)	Nuclide MDA (pCi/GDRY)	Activity (pCi/GDRY)
+	Bi-214	1133.66	0.25	3.5065E+001	1.42E-001	1.0393E+001
		1155.19	1.63	6.1112E+000		-1.2069E+000
		1207.68	0.45	2.2668E+001		2.0918E+001
		1238.11	5.79	1.9858E+000		5.4928E-001
		1280.96	1.43	6.7354E+000		3.0673E+000
		1377.67	4.00	2.1154E+000		1.7551E+000
		1385.31	0.76	1.0248E+001		-4.3513E+000
		1401.50	1.27	5.4544E+000		-3.9925E+000
		1407.98	2.15	3.4766E+000		-9.6254E-001
		1509.23	2.11	3.3170E+000		-1.1004E+000
		1538.50	0.38	1.9067E+001		-5.9203E+000
		1543.32	0.20	3.5925E+001		2.9466E+001
		1583.22	0.69	1.2618E+001		1.0414E+001
		1594.73	0.25	3.7477E+001		8.6310E+000
		1599.31	0.23	3.4916E+001		1.2296E+001
		1661.28	1.15	5.3604E+000		3.0934E+000
		1683.99	0.22	2.4281E+001		-1.8465E+001
		1729.59	2.92	2.7524E+000		1.3174E+000
		1764.49*	15.40	3.0634E-001		7.8975E-001
		1847.42	2.11	3.6712E+000		2.1339E+000
		1873.16	0.22	2.4063E+001		2.2544E+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	5.4375E+001	1.14E-001	1.8640E+001
		74.81*	6.44	1.5420E+000		2.1139E+000
		77.11*	10.80	8.2990E-001		2.4389E+000
		87.30*	4.84	1.5759E+000		1.0577E-001
		242.00*	7.43	5.7567E-001		9.3012E-001
		258.87	0.52	1.1354E+001		3.6517E+000
		274.80	0.47	1.2947E+001		-2.2068E+000
		295.22*	19.30	2.4999E-001		8.8018E-001
		351.93*	37.60	1.1426E-001		8.6879E-001
		462.00*	0.22	1.7022E+001		1.6224E+001
		533.66	0.19	3.5543E+001		6.3688E+000
		785.96	1.07	7.0468E+000		3.6485E+000
		839.04	0.59	1.4118E+001		-7.9241E-001
+	Ra-224	81.07	0.13	8.0048E+001	1.05E+000	-3.9170E+001
		83.78	0.22	4.6620E+001		5.3185E+000
		240.99*	4.10	1.0497E+000		1.6960E+000
+	Ra-226	81.07	0.20	5.2903E+001	1.71E+000	-2.5887E+001
		83.78	0.33	3.0654E+001		3.4970E+000
		94.90	0.15	5.5815E+001		-1.0518E+001
		186.21*	3.59	1.7096E+000		2.0294E+000
+	Ac-228	99.50	1.26	5.1635E+000	2.38E-001	2.7210E-001
		129.07	2.50	2.4753E+000		-1.0223E+000
		209.25*	3.97	9.4017E-001		6.3958E-001
		270.24	3.55	1.7315E+000		6.4077E-001
		328.00*	3.04	1.3390E+000		6.1978E-001
		338.32*	11.40	4.5070E-001		8.4556E-001
		409.46	2.02	3.1970E+000		1.5086E+000

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GDRY)	Nuclide MDA (pCi/GDRY)	Activity (pCi/GDRY)
+	Ac-228	463.00*	4.45	8.5058E-001	2.38E-001	8.1070E-001
		755.31	1.03	6.9213E+000		-7.1907E-002
		772.29	1.52	5.5284E+000		2.6718E+000
		794.94*	4.31	1.0616E+000		1.0001E+000
		835.70	1.70	5.0205E+000		2.4191E+000
		911.20*	26.20	2.3783E-001		9.8414E-001
		964.79	4.99	2.4923E+000		3.6396E-001
		968.96*	15.90	4.4213E-001		8.4202E-001
		1588.20	3.06	3.0324E+000		-7.6948E-001
		1630.62	1.52	4.9454E+000		2.6228E+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: N002-OF-AB05-01-02D
Nuclide Library Used: C:\GENIE2K\CAMFILES\ERT_LIBRARY_LMDA.NLB

..... IDENTIFIED NUCLIDES .....

Nuclide Name	Id Confidence	Energy (keV)		Yield (%)	Activity (pCi/GDRY)	Activity Uncertainty
K-40	0.978	1460.82*		10.55	1.37927E+001	5.95344E-001
Tl-208	0.710	72.80	@	2.02		
		74.97*	@	3.41	4.01685E+000	4.44597E-001
		84.90	@	1.51		
		277.36		6.31		
		510.77*	@	22.60	2.76454E-001	9.08070E-002
		583.19*		84.50	2.83955E-001	2.20630E-002
		763.13	@	1.81		
		860.56		12.42		
Bi-211	0.891	351.03*		13.00	2.51417E+000	1.60452E-001
Bi-212	0.571	39.86	@	1.06		
		727.33*		6.74	9.54928E-001	1.84183E-001
		785.37		1.11		
		1620.74		1.51		
		1806.00	@	0.09		
Pb-212	0.985	74.81*		10.40	1.31706E+000	1.50646E-001
		77.11*		17.50	1.51444E+000	1.16740E-001
		87.30*		7.81	6.59520E-002	2.08595E-001
		115.18	@	0.59		
		238.63*		43.30	9.11204E-001	5.22648E-002
		300.09*		3.28	1.30612E+000	3.16244E-001
Bi-214	0.474	76.86*	@	0.43	6.18305E+001	4.81206E+000
		89.81	@	0.24		
		386.77	@	0.30		
		454.77	@	0.29		
		609.31*		45.49	7.80973E-001	5.32198E-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	8.22163E-001	1.28402E-001
		1133.66	@	0.25		
		1155.19	@	1.63		
		1207.68	@	0.45		
		1238.11		5.79		
		1280.96	@	1.43		

Nuclide Name	Id Confidence	Energy (keV)		Yield (%)	Activity (pCi/GDRY)	Activity Uncertainty
Bi-214	0.474	1377.67		4.00		
		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	7.89752E-001	1.13873E-001
		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	2.11386E+000	2.43911E-001
		77.11*		10.80	2.43887E+000	1.96590E-001
		87.30*		4.84	1.05768E-001	3.34534E-001
		242.00*		7.43	9.30118E-001	1.02546E-001
		258.87	@	0.52		
		274.80	@	0.47		
		295.22*		19.30	8.80180E-001	7.93365E-002
		351.93*		37.60	8.68795E-001	5.47578E-002
		462.00*	@	0.22	1.62238E+001	4.21581E+000
		533.66	@	0.19		
		785.96	@	1.07		
		839.04	@	0.59		
Ra-224	0.832	81.07	@	0.13		
		83.78	@	0.22		
		240.99*		4.10	1.69598E+000	1.86440E-001
Ra-226	0.775	81.07	@	0.20		
		83.78	@	0.33		
		94.90	@	0.15		
		186.21*		3.59	2.02940E+000	4.02252E-001
Ac-228	0.587	99.50	@	1.26		
		129.07	@	2.50		
		209.25*		3.97	6.39583E-001	2.15311E-001
		270.24		3.55		
		328.00*		3.04	6.19778E-001	2.98306E-001
		338.32*		11.40	8.45556E-001	1.21520E-001
		409.46	@	2.02		
		463.00*		4.45	8.10703E-001	2.12605E-001
		755.31	@	1.03		
		772.29	@	1.52		
		794.94*		4.31	1.00013E+000	2.65807E-001
		835.70	@	1.70		

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/GDRY)	Activity Uncertainty
Ac-228	0.587	911.20*	26.20	9.84136E-001	8.86121E-002
		964.79	4.99		
		968.96*	15.90	8.42022E-001	1.23758E-001
		1588.20	3.06		
		1630.62 @	1.52		
Th-234	0.930	63.30*	3.75	1.03103E+000	1.45804E+000
		92.59*	4.33	1.27998E+000	4.44286E-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/GDRY)	Wt mean Activity Uncertainty
	K-40		0.978	1.379265E+001	5.953436E-001
X	Cd-109		0.937		
	Tl-208	@	0.710	2.830030E-001	2.191411E-002
	Bi-211		0.891	2.314063E-001	2.558896E-001
	Bi-212	@	0.571	9.549281E-001	1.841825E-001
	Pb-212	@	0.985	8.609766E-001	4.477582E-002
	Bi-214	@	0.474	7.880389E-001	4.504468E-002
	Pb-214	@	0.945	7.888304E-001	7.004296E-002
	Ra-224	@	0.832	2.576249E-001	2.250412E-001
	Ra-226	@	0.775	2.029400E+000	4.022524E-001
	Ac-228	@	0.587	8.826621E-001	5.308359E-002
	Th-234	@	0.930	1.258833E+000	4.249936E-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: 9/28/2016 9:34:33 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
20	781.96 Ac-228	1.5625E-003	58.97	Tol.	Sb-127

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

Errors quoted at 1.000 sigma