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To: "mark roberts" <mcr@nrc.gov>, "john buckley" <jtb@nrc.gov>, "Bruce Watson" <BAW1@nrc.gov>
Date: 6/16/05 11:31AM
Subject: FSS Report 6 - FB-1700-01 Grid 179 Sample

Attached is the gamma spec for the concrete sample taken at Grid 179. This shows all the nuclides detected. None were plant derived.

Hopefully this gives you what you need.

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***** GAMMA SPECTRUM ANALYSIS *****

Report Generated On : 12/09/04 10:02:31 AM

Sample Title : 250 mL concrete
Sample Description : XB1700-01-3-C179-VS
Sample Identification : conctete
Sample Type : CON
Sample Geometry : 250 mL concrete

Peak Locate Threshold : 3.00
Peak Locate Range (in channels) : 1 - 4096
Peak Area Range (in channels) : 50 - 4095
Identification Energy Tolerance : 1.000 keV

Sample Size : 4.948E+002 Gm

Sample Taken On : 12/09/04 8:15:00 AM
Acquisition Started : 12/09/04 9:29:10 AM

Live Time : 2000.0 seconds
Real Time : 2000.5 seconds

Energy Calibration Used Done On : 11/29/04
Efficiency Calibration Used Done On : 4/30/02



A handwritten signature in black ink, appearing to be 'A. J. ...', with the date '12/9/04' written below it.

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

Detector Name: DET2
 Sample Title: 250 mL concrete
 Peak Analysis Performed on: 12/09/04 10:02:32 AM
 Peak Analysis From Channel: 50
 Peak Analysis To Channel: 4095

	Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
M	1	142-	156	147.17	74.68	2.30E+002	137.05	3.38E+002
m	2	142-	156	151.83	77.01	2.80E+002	152.91	2.97E+002
	3	365-	374	369.96	185.98	1.21E+002	47.61	2.08E+002
M	4	470-	487	475.20	238.56	3.51E+002	203.04	1.27E+002
m	5	470-	487	481.86	241.89	1.49E+002	86.48	9.73E+001
	6	583-	593	588.66	295.24	2.25E+002	42.18	1.00E+002
	7	669-	680	674.82	338.28	4.61E+001	34.38	1.04E+002
	8	696-	707	701.95	351.84	3.34E+002	46.92	9.55E+001
	9	1013-	1025	1019.70	510.58	7.09E+001	27.34	4.71E+001
	10	1158-	1170	1164.92	583.13	1.04E+002	30.12	5.02E+001
	11	1211-	1223	1217.02	609.16	2.41E+002	37.48	4.75E+001
	12	1814-	1827	1820.92	910.86	5.89E+001	25.93	4.21E+001
	13	2232-	2246	2239.19	1119.83	5.78E+001	25.59	3.92E+001
	14	2913-	2927	2921.07	1460.49	5.82E+002	48.20	7.69E+000
	15	3519-	3535	3527.95	1763.69	4.69E+001	15.16	4.13E+000

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

Errors quoted at 1.960 sigma

***** B A C K G R O U N D S U B T R A C T R E P O R T *****

Detector Name: DET2

Sample Title: 250 mL concrete

Peak Analysis Performed on: 12/09/04 10:02:32 AM

Peak No.	Energy (keV)	Original Area	Orig. Area Uncert.	Ambient Background	Backgr. Uncert.	Subtracted Area	Subtracted Uncert.
M 1	74.68	2.30E+002	137.05			2.30E+002	1.37E+002
m 2	77.01	2.80E+002	152.91			2.80E+002	1.53E+002
3	185.98	1.21E+002	47.61	2.20E+001	2.33E+000	9.90E+001	4.78E+001
M 4	238.56	3.51E+002	203.04	8.85E+000	1.90E+000	3.42E+002	2.03E+002
m 5	241.89	1.49E+002	86.48			1.49E+002	8.65E+001
6	295.24	2.25E+002	42.18			2.25E+002	4.22E+001
7	338.28	4.61E+001	34.38			4.61E+001	3.44E+001
8	351.84	3.34E+002	46.92			3.34E+002	4.69E+001
9	510.58	7.09E+001	27.34	3.08E+001	1.63E+000	4.01E+001	2.75E+001
10	583.13	1.04E+002	30.12			1.04E+002	3.01E+001
11	609.16	2.41E+002	37.48			2.41E+002	3.75E+001
12	910.86	5.89E+001	25.93	1.88E+000	5.20E-001	5.70E+001	2.59E+001
13	1119.83	5.78E+001	25.59			5.78E+001	2.56E+001
14	1460.49	5.82E+002	48.20	1.23E+001	9.33E-001	5.70E+002	4.82E+001
15	1763.69	4.69E+001	15.16			4.69E+001	1.52E+001

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

 ***** 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: 250 mL concrete
 Nuclide Library Used: C:\GENIE2K\CAMFILES\STDLIB.NLB

..... IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pci/Gm)	Activity Uncertainty
K-40	0.984	1460.81*	10.67	1.86614E+001	1.91285E+000
TL-208	0.733	277.35	6.80		
		510.84*	21.60	2.41967E-001	1.67780E-001
		583.14*	84.20	1.82174E-001	5.42817E-002
		763.13	1.64		
PB-212	0.779	860.37	12.46		
		74.81*	10.70	1.65900E+000	1.00920E+000
		77.11*	18.00	1.13781E+000	6.34332E-001
		87.30	8.00		
		238.63*	44.60	5.12680E-001	3.07165E-001
BI-214	0.456	300.09	3.41		
		76.86*	0.36	5.68905E+001	3.16758E+001
		79.29	0.60		
		89.80	0.27		
		273.70	0.18		
		387.00	0.37		
		389.10	0.41		
		405.74	0.17		
		454.77	0.32		
		469.69	0.13		
		474.38	0.12		
		609.31*	46.30	8.03731E-001	1.39374E-001
		665.45	1.57		
		703.11	0.47		
		719.86	0.41		
		752.84	0.13		
		768.36	5.04		
		786.10	0.32		
		806.17	1.23		
		821.18	0.15		
		904.25	0.11		
		934.06	3.21		
		964.08	0.38		
1051.96	0.32				
1069.96	0.29				
1120.29*	15.10	1.05625E+000	4.75309E-001		
1133.66	0.26				
1155.19	1.70				
1207.68	0.46				
1238.11	5.94				
1280.96	1.48				
1303.76	0.12				

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pci/Gm)	Activity Uncertainty
BI-214	0.456	1377.67	4.11		
		1385.31	0.78		
		1401.50	1.39		
		1407.98	2.49		
		1509.23	2.22		
		1538.50	0.41		
		1543.32	0.36		
		1583.22	0.72		
		1594.73	0.27		
		1599.31	0.34		
		1661.28	1.15		
		1683.99	0.24		
		1729.59	2.88		
		1764.49*	15.80	1.19894E+000	4.03638E-001
		1838.36	0.38		
		1847.42	2.04		
		1873.16	0.23		
		1896.30	0.18		
		2118.55	1.17		
2204.21	4.98				
2293.36	0.32				
2447.86	1.56				
PB-214	0.886	53.23	1.11		
		74.82*	6.21	2.85849E+000	1.73153E+000
		77.11*	10.50	1.95053E+000	1.08702E+000
		87.30	4.67		
		241.98*	7.49	1.34530E+000	7.88640E-001
		295.21*	19.20	9.28602E-001	1.91089E-001
		351.92*	37.20	8.31198E-001	1.34194E-001
RA-226	0.992	186.21*	3.28	1.71235E+000	8.35192E-001
		U-235	0.667	89.95	2.70
U-235	0.667	143.76	10.50		
		185.71*	54.00	1.04009E-001	5.06959E-002

* = Energy line found in the spectrum.

@ = Energy line not used for Weighted Mean Activity

Energy Tolerance : 1.000 keV

Nuclide confidence index threshold = 0.10

Errors quoted at 1.960 sigma

 ***** INTERFERENCE CORRECTED REPORT *****

	Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pci/Gm)	Wt mean Activity Uncertainty
X	ANN	0.972		
	K-40	0.984	1.866139E+001	1.912847E+000
	TL-208	0.733	1.878398E-001	5.164607E-002
	PB-212	0.779	5.753267E-001	2.658472E-001
	BI-214	0.456	8.581212E-001	1.219996E-001
	PB-214	0.886	8.746752E-001	1.018938E-001
?	RA-226	0.992	1.712349E+000	8.351915E-001
?	U-235	0.667	1.040093E-001	5.069586E-002
X	AM-243	1.000		

? = 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 1.960 sigma

***** UNIDENTIFIED PEAKS *****

Peak Locate Performed on: 12/09/04 10:02:32 AM
 Peak Locate From Channel: 50
 Peak Locate To Channel: 4095

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty
7	338.28	2.3028E-002	74.64
12	910.86	2.8514E-002	45.50

*uncertainty in energy not consistent with planned nuclides
 12/9/04*

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

Errors quoted at 1.960 sigma

***** N U C L I D E M D A R E P O R T *****

Detector Name: DET2
Sample Geometry: 250 mL concrete
Sample Title: 250 mL concrete
Nuclide Library Used: C:\GENIE2K\CAMFILES\STDLIB.NLB

	Nuclide Name	Nuclide MDA (pci/Gm)
	ANN	5.72E-002
	BE-7	4.96E-001
+	K-40	7.33E-001
	CR-51	5.09E-001
	MN-54	8.80E-002
	CO-57	5.20E-002
	CO-58	7.97E-002
	FE-59	1.79E-001
	CO-60	9.37E-002 ✓
	ZN-65	2.79E-001
	KR-85	1.73E+001
	Y-88	6.63E-002
	NB-94	7.74E-002
	NB-95	8.88E-002
	ZR-95	1.28E-001
	MO-99	5.49E-002
	RU-103	6.11E-002
	RH-106	3.70E-001
	CD-109	1.76E+000
	AG-110M	6.37E-002
	SN-113	7.50E-002
	SB-124	6.19E-002
	SB-125	1.88E-001
	SB-126	6.00E-002
	SN-126	1.82E-001
	CS-134	9.58E-002
	CS-137	7.77E-002 ✓
	CE-139	5.22E-002
	CE-144	3.84E-001
	EU-152	1.54E-001
	EU-154	1.12E-001
	EU-155	2.14E-001
	HG-203	6.21E-002
+	TL-208	7.12E-002
	BI-212	7.40E-001
+	PB-212	8.45E-002
+	BI-214	1.31E-001
+	PB-214	1.33E-001
+	RA-226	1.32E+000
	AC-228	4.45E-001
	PA-234M	1.80E+001
	TH-234	1.22E+000

	Nuclide Name	Nuclide MDA (pci/Gm)
+	U-235	7.99E-002
	AM-241	2.15E-001
	AM-243	1.03E-001
	CM-243	2.09E-001

+ = Nuclide identified during the nuclide identification

@ = Half-life too short to be able to perform the decay correction