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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: C:\GENIE2K\CAMFILES\UNC 2017\IMC Samples\IMC-2008\W6H-IMC-200

Report Generated On : 3/27/2017 10:34:04 AM

Sample Title : W6H-IMC-2008-S-P-2
Sample Description :
Sample Identification : 2008-S-P-2
Sample Type :
Sample Geometry : cylinder

Peak Locate Threshold : 3.00
Peak Locate Range (in channels) : 40 - 8192
Peak Area Range (in channels) : 40 - 8192
Identification Energy Tolerance : 1.000 keV

Sample Size : 3.110E+002 grams

Sample Taken On : 3/17/2017 12:00:00 AM
Acquisition Started : 3/27/2017 9:53:03 AM

Live Time : 1800.0 seconds
Real Time : 1800.4 seconds

Dead Time : 0.02 %

Energy Calibration Used Done On : 3/24/2017
Efficiency Calibration Used Done On : 3/27/2017
Efficiency ID : H-IMC-2008-S-P-2

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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: 8566
Sample Title: W6H-IMC-2008-S-P-2
Peak Analysis Performed on: 3/27/2017 10:34:00 AM
Peak Analysis From Channel: 40
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
F	1	182-	191	186.91	46.93	0.30	3.57E+001	15.92	6.50E+001
M	2	295-	315	299.81	75.17	0.59	7.32E+001	24.11	1.19E+002
m	3	295-	315	308.79	77.41	0.60	7.26E+001	22.20	8.33E+001
F	4	732-	749	742.06	185.80	0.95	6.91E+001	20.44	6.98E+001
F	5	945-	960	953.40	238.66	1.08	1.18E+002	25.06	5.60E+001
F	6	1175-	1184	1179.59	295.24	1.04	4.07E+001	15.98	2.40E+001
F	7	2028-	2049	2040.00	510.47	1.71	8.12E+001	29.97	3.30E+001
F	8	5824-	5850	5836.64	1460.19	2.61	2.08E+002	20.02	9.00E+000

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

Errors quoted at 1.960 sigma

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***** 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: W6H-IMC-2008-S-P-2
Nuclide Library Used: C:\GENIE2K\CAMFILES\UNC 2017 Full NLB.NL

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

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/gram)	Activity Uncertainty
K-40	0.938	1460.82*	10.66	1.03959E+001	1.33485E+000
Pb-210	0.976	46.54*	4.25	1.22191E+000	6.44620E-001
Pb-212	0.994	74.82*	10.28	5.04562E-001	1.94960E-001
		77.11*	17.10	2.93971E-001	1.07649E-001
		86.83	2.07		
		87.35	3.97		
		89.78	1.46		
		115.18	0.60		
		238.63*	43.60	2.54581E-001	6.74903E-002
		300.09	3.30		
PB-214	0.408	74.82*	5.80	8.94292E-001	3.54694E-001
		77.11*	9.70	5.18238E-001	1.95424E-001
		86.83	1.70		
		87.35	2.24		
		89.78	0.82		
		241.99	7.25		
		258.76	0.53		
		274.80	0.35		
		295.22*	18.42	2.56023E-001	1.08171E-001
		351.93	35.60		
		462.02	0.21		
		480.43	0.34		
		487.14	0.43		
		533.66	0.18		
		580.14	0.37		
		785.96	1.06		
		839.07	0.58		
Ra-226	0.976	81.07	0.20		
		83.79	0.32		
		186.21*	3.64	1.44939E+000	4.93714E-001

* = Energy line found in the spectrum.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.10
Errors quoted at 1.960 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/gram)	Wt mean Activity Uncertainty
K-40	0.938	1.039595E+001	1.334853E+000
Pb-210	0.976	1.221906E+000	6.446203E-001
Pb-212	0.994	2.396000E-001	5.762508E-002
PB-214	0.408	2.339104E-001	9.548989E-002
Ra-226	0.976	1.449391E+000	4.937140E-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 1.960 sigma

********** U N I D E N T I F I E D P E A K S **********

Peak Locate Performed on: 3/27/2017 10:34:00 AM
Peak Locate From Channel: 40
Peak Locate To Channel: 8192

	Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty	Peak Type	Tol. Nuclide
F	7	510.47	4.5107E-002	36.92		

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

Errors quoted at 1.960 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: 8566
Sample Geometry: cylinder
Sample Title: W6H-IMC-2008-S-P-2
Nuclide Library Used: C:\GENIE2K\CAMFILES\UNC 2017 Full NLB.NL

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/gram)	Nuclide MDA (pCi/gram)	Activity (pCi/gram)	Dec. Leve (pCi/gram
+	K-40	1460.82*	10.66	9.141E-001	9.14E-001	1.040E+001	3.895E-00
	CO-60	1173.23	99.85	1.595E-001	9.93E-002	7.407E-002	7.374E-00
		1332.49	99.98	9.934E-002		-9.136E-002	4.299E-00
	CS-137	661.66	85.10	1.362E-001	1.36E-001	3.375E-002	6.388E-00
+	Pb-210	46.54*	4.25	1.575E+000	1.57E+000	1.222E+000	7.410E-00
	BI-212	288.20	0.34	1.603E+001	1.90E+000	1.643E+000	7.562E+00
		328.03	0.13	4.518E+001		-2.785E+001	2.120E+00
		452.98	0.36	2.180E+001		1.501E+001	1.022E+00
		727.33	6.67	1.899E+000		4.987E-001	8.911E-00
		785.37	1.10	1.125E+001		3.664E+000	5.246E+00
		893.41	0.38	3.317E+001		-1.094E+001	1.533E+00
		952.12	0.17	7.870E+001		-1.397E+001	3.641E+00
		1078.62	0.56	2.666E+001		-8.107E+000	1.234E+00
		1512.70	0.29	2.841E+001		-8.410E-001	1.165E+00
		1620.50	1.47	8.905E+000		-5.378E+000	3.916E+00
+	Pb-212	74.82*	10.28	3.692E-001	9.79E-002	5.046E-001	1.753E-00
		77.11*	17.10	1.830E-001		2.940E-001	8.601E-00
		86.83	2.07	2.151E+000		1.091E-001	1.034E+00
		87.35	3.97	1.119E+000		-3.405E-001	5.374E-00
		89.78	1.46	2.912E+000		-2.854E+000	1.397E+00
		115.18	0.60	5.170E+000		4.467E-001	2.445E+00
		238.63*	43.60	9.792E-002		2.546E-001	4.604E-00
		300.09	3.30	1.714E+000		-2.482E+000	8.087E-00
	BI-214	76.86	0.55	1.142E+001	2.64E-001	2.208E+001	5.537E+00
		79.29	0.91	5.417E+000		-2.251E-001	2.607E+00
		89.26	0.11	3.884E+001		1.333E+001	1.864E+00
		89.81	0.21	2.024E+001		-1.984E+001	9.712E+00
		273.80	0.13	3.929E+001		-2.516E+000	1.851E+00
		348.92	0.10	7.262E+001		9.254E+001	3.452E+00
		386.78	0.29	2.204E+001		-6.281E+000	1.032E+00
		388.89	0.40	1.627E+001		1.034E+000	7.615E+00
		405.72	0.17	4.556E+001		4.868E+001	2.149E+00
		454.79	0.29	2.516E+001		-1.206E+001	1.174E+00
		469.77	0.13	6.111E+001		-5.092E+000	2.863E+00
		609.32	45.49	2.641E-001		9.388E-002	1.248E-00
		665.45	1.53	6.984E+000		-3.287E+000	3.257E+00
		703.11	0.47	2.246E+001		3.943E+000	1.043E+00
		719.87	0.39	2.765E+001		-3.252E+001	1.284E+00
		752.85	0.13	9.453E+001		1.000E+000	4.411E+00
		768.36	4.89	2.537E+000		7.686E-001	1.184E+00
		786.35	0.32	3.794E+001		-4.442E+000	1.766E+00
		806.18	1.26	8.962E+000		-3.919E+000	4.140E+00

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/gram)	Nuclide MDA (pCi/gram)	Activity (pCi/gram)	Dec. Leve (pCi/gram
	BI-214	821.18	0.16	8.023E+001	2.64E-001	4.076E+001	3.740E+00
		826.45	0.12	9.336E+001		-3.973E+001	4.292E+00
		934.06	3.11	4.731E+000		-9.176E-002	2.207E+00
		964.08	0.37	4.169E+001		1.929E+001	1.946E+00
		1051.96	0.31	4.269E+001		-3.173E+001	1.961E+00
		1069.96	0.27	5.441E+001		3.189E+000	2.517E+00
		1120.29	14.92	1.094E+000		5.940E-001	5.084E-00
		1133.66	0.25	5.670E+001		8.322E+000	2.604E+00
		1155.21	1.63	9.675E+000		6.504E-001	4.477E+00
		1207.68	0.45	4.006E+001		6.835E+000	1.867E+00
		1238.11	5.83	2.821E+000		-9.407E-002	1.303E+00
		1280.98	1.43	9.764E+000		1.659E+000	4.433E+00
		1303.75	0.11	1.382E+002		4.513E+000	6.299E+00
		1377.67	3.99	3.684E+000		1.311E+000	1.670E+00
		1385.31	0.79	1.835E+001		-6.377E+000	8.307E+00
		1401.52	1.33	1.021E+001		-2.896E+000	4.581E+00
		1407.99	2.39	5.886E+000		4.428E+000	2.652E+00
		1509.21	2.13	4.079E+000		-1.771E+000	1.692E+00
		1538.53	0.40	2.438E+001		-7.463E+000	1.029E+00
		1543.34	0.30	3.591E+001		1.690E+001	1.546E+00
		1583.20	0.70	1.727E+001		-2.566E+000	7.539E+00
		1594.75	0.27	5.173E+001		4.522E+001	2.295E+00
		1599.37	0.32	3.792E+001		-6.622E+000	1.655E+00
		1661.27	1.05	1.110E+001		1.338E+000	4.778E+00
		1684.01	0.21	5.847E+001		1.227E+001	2.542E+00
		1729.59	2.88	4.047E+000		1.795E+000	1.732E+00
		1764.49	15.30	1.324E+000		1.347E+000	6.061E-00
		1838.36	0.35	3.260E+001		-1.778E+000	1.377E+00
		1847.43	2.03	5.416E+000		-6.338E-001	2.268E+00
		1873.16	0.21	6.072E+001		2.852E+001	2.614E+00
		1896.05	0.15	9.915E+001		7.700E+001	4.345E+00
>		2118.51	1.16	0.000E+000		0.000E+000	0.000E+00
>		2204.06	4.92	0.000E+000		0.000E+000	0.000E+00
>		2293.38	0.31	0.000E+000		0.000E+000	0.000E+00
>		2447.70	1.55	0.000E+000		0.000E+000	0.000E+00
+	PB-214	74.82*	5.80	6.544E-001	1.60E-001	8.943E-001	3.106E-00
		77.11*	9.70	3.226E-001		5.182E-001	1.516E-00
		86.83	1.70	2.620E+000		1.329E-001	1.259E+00
		87.35	2.24	1.983E+000		-6.034E-001	9.525E-00
		89.78	0.82	5.185E+000		-5.081E+000	2.487E+00
		241.99	7.25	9.894E-001		-2.285E-001	4.769E-00
		258.76	0.53	9.195E+000		-4.363E+000	4.339E+00
		274.80	0.35	1.337E+001		-1.366E+001	6.276E+00
		295.22*	18.42	1.603E-001		2.560E-001	7.163E-00
		351.93	35.60	2.124E-001		2.650E-001	1.010E-00
		462.02	0.21	3.877E+001		8.045E+000	1.821E+00
		480.43	0.34	2.555E+001		7.786E+000	1.200E+00
		487.14	0.43	1.877E+001		-7.889E-001	8.775E+00
		533.66	0.18	4.716E+001		6.988E+000	2.198E+00
		580.14	0.37	3.151E+001		3.000E+001	1.491E+00
		785.96	1.06	1.145E+001		-1.341E+000	5.328E+00

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/gram)	Nuclide MDA (pCi/gram)	Activity (pCi/gram)	Dec. Leve (pCi/gram
+	PB-214	839.07	0.58	2.192E+001	1.60E-001	5.092E+000	1.020E+00
+	Ra-226	81.07	0.20	1.887E+001	1.10E+000	-3.080E+000	8.971E+00
		83.79	0.32	1.246E+001		1.218E+001	5.953E+00
		186.21*	3.64	1.095E+000		1.449E+000	5.192E-00
	U-234	53.20	0.12	4.421E+001	4.42E+001	-2.004E+001	2.087E+00
		120.90	0.04	8.985E+001		-1.414E+001	4.253E+00
	U-235	72.70	0.12	4.420E+001	3.34E-001	1.582E+001	2.127E+00
		89.96	3.43	1.239E+000		-1.214E+000	5.942E-00
		93.35	5.54	7.033E-001		1.019E-001	3.363E-00
		104.82	0.69	4.533E+000		2.239E-001	2.145E+00
		105.60	1.31	2.380E+000		-3.745E-001	1.126E+00
		108.58	0.50	6.628E+000		-1.960E+000	3.148E+00
		109.19	1.66	1.973E+000		6.151E-003	9.366E-00
		140.76	0.20	1.690E+001		-2.110E+001	8.011E+00
		143.76	10.96	3.338E-001		3.579E-002	1.588E-00
		163.36	5.08	7.153E-001		-2.651E-001	3.390E-00
		182.62	0.39	1.203E+001		-1.111E+000	5.756E+00
		194.94	0.63	6.689E+000		1.617E+000	3.175E+00
		202.12	1.08	4.016E+000		-2.036E+000	1.906E+00
		205.32	5.02	8.752E-001		-4.438E-001	4.153E-00
		221.39	0.12	3.823E+001		-5.219E+000	1.811E+00
	U-238	63.29	3.70	1.307E+000	9.74E-001	1.189E-001	6.222E-00
		92.60	4.23	9.735E-001		3.122E-001	4.666E-00
		766.42	0.32	3.925E+001		3.091E+001	1.834E+00
		1001.03	0.84	1.615E+001		2.861E+000	7.455E+00

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

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**** L I N E A C T I V I T Y C O N S I S T E N C Y E V A L U A T O R ***
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Analysis using Key Line Activities

Filename: C:\GENIE2K\CAMFILES\UNC 2017\IMC Samples\IMC-2008\W6H-IMC-200

Equation used to calculate plot: ln(Ratio) = A + B*ln(Energy)
where: Ratio = Activity/KL Activity

Notes:
'^' Denotes Key Line energy
* All uncertainties quoted at 1.96 sigma

Nuclide	Energy (keV)		Activity (pCi/gram)	Activity %Uncert*	Ratio[%Uncert]	A	B [uncert]
K-40	1460.8	^	1.04E+001	12.840			
Pb-210	46.5	^	1.22E+000	52.755			
Pb-212	74.8		5.05E-001	38.640	1.982[46.859]	1.97	-0.360
	77.1		2.94E-001	36.619	1.155[45.208]		[0.434]
	238.6	^	2.55E-001	26.510	1.000[37.491]		
PB-214	74.8		8.94E-001	******			
	77.1		5.18E-001	******			
	295.2		2.56E-001	******			
Ra-226	186.2	^	1.45E+000	34.064			