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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 2:32:17 PM

Sample Title : W6H-IMC-2008-S-P-8
Sample Description :
Sample Identification : 2008-S-P-8
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 : 2.808E+002 grams

Sample Taken On : 3/17/2017 12:00:00 AM
Acquisition Started : 3/27/2017 1:44:27 PM

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-8

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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-8
Peak Analysis Performed on: 3/27/2017 2:32:13 PM
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	181-	192	186.19	46.75	0.63	6.62E+001	21.34	8.80E+001
M	2	286-	315	291.02	72.97	0.76	2.98E+001	17.05	7.43E+001
m	3	286-	315	299.56	75.11	0.77	1.16E+002	25.40	7.77E+001
m	4	286-	315	308.26	77.28	0.77	9.72E+001	23.58	6.70E+001
F	5	735-	749	741.82	185.73	1.04	6.56E+001	20.43	5.63E+001
F	6	946-	956	952.65	238.47	0.80	8.53E+001	22.35	5.36E+001
F	7	1174-	1187	1178.99	295.09	0.97	4.04E+001	16.00	3.64E+001
F	8	1401-	1412	1405.39	351.73	0.98	6.93E+001	19.07	2.76E+001
F	9	2425-	2441	2432.93	608.76	1.63	5.78E+001	32.92	2.27E+001
F	10	3865-	3878	3872.21	968.79	1.26	2.28E+001	12.16	1.58E+001
F	11	5826-	5849	5837.77	1460.47	2.41	2.07E+002	26.89	2.67E+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-8
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	0.980	1460.82*	10.66	1.30534E+001	2.02613E+000
Pb-210	0.993	46.54*	4.25	2.69250E+000	1.15585E+000
Pb-212	0.995	74.82*	10.28	9.77072E-001	2.90531E-001
		77.11*	17.10	4.80695E-001	1.51511E-001
		86.83	2.07		
		87.35	3.97		
		89.78	1.46		
		115.18	0.60		
		238.63*	43.60	2.29339E-001	7.02256E-002
		300.09	3.30		
BI-214	0.255	76.86*	0.55	1.50824E+001	4.77312E+000
		79.29	0.91		
		89.26	0.11		
		89.81	0.21		
		273.80	0.13		
		348.92	0.10		
		386.78	0.29		
		388.89	0.40		
		405.72	0.17		
		454.79	0.29		
		469.77	0.13		
		609.32*	45.49	3.89346E-001	2.26286E-001
		665.45	1.53		
		703.11	0.47		
		719.87	0.39		
		752.85	0.13		
		768.36	4.89		
		786.35	0.32		
		806.18	1.26		
		821.18	0.16		
		826.45	0.12		
		934.06	3.11		
		964.08	0.37		
		1051.96	0.31		
		1069.96	0.27		
		1120.29	14.92		
		1133.66	0.25		
		1155.21	1.63		
		1207.68	0.45		
		1238.11	5.83		
		1280.98	1.43		
		1303.75	0.11		

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/gram)	Activity Uncertainty
BI-214	0.255	1377.67	3.99		
		1385.31	0.79		
		1401.52	1.33		
		1407.99	2.39		
		1509.21	2.13		
		1538.53	0.40		
		1543.34	0.30		
		1583.20	0.70		
		1594.75	0.27		
		1599.37	0.32		
		1661.27	1.05		
		1684.01	0.21		
		1729.59	2.88		
		1764.49	15.30		
		1838.36	0.35		
		1847.43	2.03		
		1873.16	0.21		
		1896.05	0.15		
		2118.51	1.16		
		2204.06	4.92		
		2293.38	0.31		
		2447.70	1.55		
PB-214	0.851	74.82*	5.80	1.73178E+000	5.37748E-001
		77.11*	9.70	8.47411E-001	2.77779E-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	3.17165E-001	1.35051E-001
		351.93*	35.60	3.37294E-001	1.05261E-001
		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	0.969	81.07	0.20		
		83.79	0.32		
		186.21*	3.64	1.71082E+000	6.06188E-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 *****
****

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/gram)	Wt mean Activity Uncertainty
K-40	0.980	1.305343E+001	2.026133E+000
Pb-210	0.993	2.692504E+000	1.155845E+000
Pb-212	0.995	2.613012E-001	6.272815E-002
BI-214	0.255	3.897513E-001	2.260674E-001
PB-214	0.851	3.550297E-001	7.922655E-002
Ra-226	0.969	1.710823E+000	6.061883E-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 2:32:13 PM
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
M 2	72.97	1.6556E-002	57.21	Tol.	U-235
F 10	968.79	1.2675E-002	53.32		

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: 8566
Sample Geometry: cylinder
Sample Title: W6H-IMC-2008-S-P-8
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	6.877E-001	6.88E-001	1.305E+001	2.586E-00
	CO-60	1173.23	99.85	1.937E-001	1.86E-001	-5.702E-002	8.927E-00
		1332.49	99.98	1.859E-001		-8.067E-002	8.453E-00
	CS-137	661.66	85.10	1.549E-001	1.55E-001	-6.865E-002	7.214E-00
+	Pb-210	46.54*	4.25	2.286E+000	2.29E+000	2.693E+000	1.088E+00
	BI-212	288.20	0.34	2.012E+001	2.59E+000	-1.273E+001	9.492E+00
		328.03	0.13	6.318E+001		1.934E+001	2.985E+00
		452.98	0.36	2.579E+001		-3.845E+000	1.205E+00
		727.33	6.67	2.595E+000		2.018E+000	1.223E+00
		785.37	1.10	1.426E+001		-6.662E+000	6.651E+00
		893.41	0.38	4.935E+001		4.832E+001	2.310E+00
		952.12	0.17	1.017E+002		1.880E+001	4.717E+00
		1078.62	0.56	3.389E+001		7.061E+000	1.570E+00
		1512.70	0.29	5.362E+001		2.521E+001	2.358E+00
		1620.50	1.47	9.429E+000		2.059E+000	4.037E+00
+	Pb-212	74.82*	10.28	3.674E-001	1.07E-001	9.771E-001	1.723E-00
		77.11*	17.10	2.017E-001		4.807E-001	9.414E-00
		86.83	2.07	2.672E+000		1.699E+000	1.284E+00
		87.35	3.97	1.367E+000		-5.759E-001	6.566E-00
		89.78	1.46	3.561E+000		-2.804E+000	1.708E+00
		115.18	0.60	6.665E+000		7.189E+000	3.160E+00
		238.63*	43.60	1.071E-001		2.293E-001	4.993E-00
		300.09	3.30	2.314E+000		2.584E-001	1.097E+00
+	BI-214	76.86*	0.55	6.327E+000	1.82E-001	1.508E+001	2.954E+00
		79.29	0.91	6.452E+000		-2.748E-001	3.102E+00
		89.26	0.11	4.856E+001		4.938E+001	2.332E+00
		89.81	0.21	2.476E+001		-1.949E+001	1.188E+00
		273.80	0.13	5.056E+001		6.386E+000	2.386E+00
		348.92	0.10	9.962E+001		-1.504E+002	4.757E+00
		386.78	0.29	2.723E+001		-1.637E+001	1.274E+00
		388.89	0.40	2.162E+001		1.851E+001	1.016E+00
		405.72	0.17	5.761E+001		3.077E+001	2.719E+00
		454.79	0.29	3.175E+001		-1.038E+000	1.482E+00
		469.77	0.13	7.941E+001		1.648E+001	3.730E+00
		609.32*	45.49	1.821E-001		3.893E-001	8.195E-00
		665.45	1.53	9.442E+000		2.665E+000	4.426E+00
		703.11	0.47	3.065E+001		1.066E+001	1.432E+00
		719.87	0.39	3.800E+001		-1.378E+001	1.776E+00
		752.85	0.13	1.074E+002		3.795E+001	4.971E+00
		768.36	4.89	3.124E+000		7.322E-001	1.456E+00
		786.35	0.32	5.124E+001		2.183E+000	2.397E+00
		806.18	1.26	1.074E+001		-3.054E+000	4.943E+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	9.410E+001	1.82E-001	-8.309E+000	4.363E+00
		826.45	0.12	1.356E+002		4.425E+001	6.307E+00
		934.06	3.11	5.744E+000		6.084E+000	2.673E+00
		964.08	0.37	5.605E+001		1.505E+001	2.628E+00
		1051.96	0.31	5.605E+001		-1.620E+001	2.583E+00
		1069.96	0.27	6.858E+001		-2.719E+000	3.173E+00
		1120.29	14.92	1.368E+000		1.659E-001	6.356E-00
		1133.66	0.25	7.942E+001		-2.327E+001	3.680E+00
		1155.21	1.63	1.187E+001		1.094E+000	5.479E+00
		1207.68	0.45	4.158E+001		-2.887E+001	1.908E+00
		1238.11	5.83	3.591E+000		1.162E+000	1.660E+00
		1280.98	1.43	1.345E+001		-3.766E+000	6.157E+00
		1303.75	0.11	1.744E+002		8.540E+001	7.947E+00
		1377.67	3.99	4.904E+000		-1.780E-002	2.236E+00
		1385.31	0.79	2.281E+001		3.192E+000	1.031E+00
		1401.52	1.33	1.493E+001		1.210E+001	6.803E+00
		1407.99	2.39	7.778E+000		-4.727E+000	3.521E+00
		1509.21	2.13	6.529E+000		9.196E-001	2.825E+00
		1538.53	0.40	2.653E+001		-1.472E+001	1.087E+00
		1543.34	0.30	3.494E+001		-1.551E+000	1.432E+00
		1583.20	0.70	1.993E+001		-6.308E+000	8.580E+00
		1594.75	0.27	6.669E+001		1.692E+001	2.966E+00
		1599.37	0.32	5.397E+001		-5.990E+000	2.395E+00
		1661.27	1.05	1.401E+001		-8.631E-001	6.033E+00
		1684.01	0.21	5.025E+001		-2.922E+001	2.030E+00
		1729.59	2.88	5.289E+000		2.539E+000	2.277E+00
		1764.49	15.30	1.467E+000		9.912E-001	6.630E-00
		1838.36	0.35	3.751E+001		-6.975E+000	1.556E+00
		1847.43	2.03	6.842E+000		3.695E+000	2.866E+00
		1873.16	0.21	5.913E+001		-4.823E+001	2.424E+00
		1896.05	0.15	9.536E+001		-1.459E+001	3.994E+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	6.511E-001	1.38E-001	1.732E+000	3.054E-00
		77.11*	9.70	3.555E-001		8.474E-001	1.660E-00
		86.83	1.70	3.253E+000		2.069E+000	1.564E+00
		87.35	2.24	2.423E+000		-1.021E+000	1.164E+00
		89.78	0.82	6.341E+000		-4.993E+000	3.042E+00
		241.99	7.25	1.221E+000		-2.066E+000	5.884E-00
		258.76	0.53	1.100E+001		3.008E+000	5.180E+00
		274.80	0.35	1.820E+001		-4.167E-001	8.590E+00
		295.22*	18.42	2.625E-001		3.172E-001	1.206E-00
		351.93*	35.60	1.380E-001		3.373E-001	6.243E-00
		462.02	0.21	4.598E+001		1.517E+001	2.152E+00
		480.43	0.34	3.293E+001		1.089E+001	1.550E+00
		487.14	0.43	2.400E+001		7.065E-001	1.123E+00
		533.66	0.18	6.002E+001		3.198E+001	2.801E+00
		580.14	0.37	3.753E+001		2.011E+001	1.770E+00
		785.96	1.06	1.546E+001		6.588E-001	7.232E+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	2.716E+001	1.38E-001	-2.798E+000	1.262E+00
+	Ra-226	81.07	0.20	2.009E+001	1.16E+000	-1.943E+001	9.477E+00
		83.79	0.32	1.398E+001		3.693E+000	6.654E+00
		186.21*	3.64	1.161E+000		1.711E+000	5.452E-00
	PA-234	742.81	0.11	1.306E+002	2.09E+001	-7.956E+000	6.059E+00
		766.42	0.32	4.522E+001		-2.032E+001	2.098E+00
		1001.03	0.84	2.091E+001		-4.939E+000	9.676E+00
	TH-234	63.29	3.70	1.588E+000	1.59E+000	3.750E-001	7.563E-00
		92.38	2.13	2.349E+000		2.267E+000	1.126E+00
		92.80	2.10	2.341E+000		1.175E+000	1.121E+00
		112.81	0.21	1.964E+001		3.243E+000	9.334E+00
	U-234	53.20	0.12	5.245E+001	5.25E+001	1.502E+001	2.476E+00
		120.90	0.04	1.060E+002		1.720E+001	5.004E+00
	U-235	72.70	0.12	5.066E+001	4.03E-001	-1.479E+000	2.433E+00
		89.96	3.43	1.515E+000		-1.193E+000	7.267E-00
		93.35	5.54	8.506E-001		-1.390E-001	4.065E-00
		104.82	0.69	5.379E+000		1.508E+000	2.540E+00
		105.60	1.31	2.798E+000		6.727E-002	1.321E+00
		108.58	0.50	7.846E+000		3.021E+000	3.719E+00
		109.19	1.66	2.383E+000		1.001E+000	1.130E+00
		140.76	0.20	2.188E+001		2.107E+000	1.040E+00
		143.76	10.96	4.031E-001		1.543E-001	1.915E-00
		163.36	5.08	8.338E-001		1.923E-002	3.937E-00
		182.62	0.39	1.518E+001		-6.005E+000	7.264E+00
		194.94	0.63	8.084E+000		-5.314E+000	3.831E+00
		202.12	1.08	4.958E+000		3.403E-001	2.352E+00
		205.32	5.02	1.012E+000		-6.777E-001	4.783E-00
		221.39	0.12	4.594E+001		-7.198E+000	2.171E+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
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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	^	1.31E+001	15.522			
Pb-210	46.5	^	2.69E+000	42.928			
Pb-212	74.8		9.77E-001	29.735	4.260[42.683]	5.34	-0.977
	77.1		4.81E-001	31.519	2.096[43.944]		[0.463]
	238.6	^	2.29E-001	30.621	1.000[43.305]		

Nuclide	Energy (keV)		Activity (pCi/gram)	Activity %Uncert*	Ratio[%Uncert]	A	B [uncert]
BI-214	76.9		1.51E+001	31.647	38.738[66.177]	11.33	-1.766
	609.3	^	3.89E-001	58.119	1.000[82.193]		[0.510]
PB-214	74.8		1.73E+000	31.052	5.134[44.024]	5.17	-0.896
	77.1		8.47E-001	32.780	2.512[45.259]		[0.316]
	295.2		3.17E-001	42.581	0.940[52.792]		
	351.9	^	3.37E-001	31.207	1.000[44.134]		
Ra-226	186.2	^	1.71E+000	35.433			