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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-2120\W6H-IMC-212

Report Generated On : 4/19/2017 10:42:30 AM

Sample Title : W6H-IMC-2120-S-P-6
Sample Description :
Sample Identification : 2120-S-P-6
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 : 1.500 keV

Sample Size : 2.522E+002 grams

Sample Taken On : 3/17/2017 12:00:00 AM
Acquisition Started : 3/29/2017 12:34:20 PM

Live Time : 1800.0 seconds
Real Time : 1800.3 seconds

Dead Time : 0.02 %

Energy Calibration Used Done On : 3/24/2017
Efficiency Calibration Used Done On : 4/19/2017
Efficiency ID : H-IMC-2120-S-P-6

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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-2120-S-P-6
Peak Analysis Performed on: 4/19/2017 10:42:25 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	179-	192	185.93	46.68	0.73	6.52E+001	20.05	6.53E+001
M	2	287-	314	291.13	73.00	0.67	3.44E+001	17.26	7.09E+001
m	3	287-	314	299.58	75.11	0.68	1.06E+002	24.37	6.42E+001
m	4	287-	314	308.58	77.36	0.69	6.78E+001	20.04	5.68E+001
F	5	356-	363	360.36	90.31	0.26	2.43E+001	20.80	4.80E+001
F	6	736-	749	742.41	185.88	1.06	8.38E+001	22.73	5.95E+001
F	7	947-	958	953.13	238.59	0.89	9.34E+001	23.35	5.70E+001
F	8	1173-	1185	1179.46	295.21	0.77	2.88E+001	13.45	2.86E+001
F	9	1400-	1422	1405.41	351.73	0.79	3.51E+001	15.30	5.75E+001
F	10	5826-	5851	5837.09	1460.30	2.49	1.45E+002	23.26	1.59E+001

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-2120-S-P-6
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	0.981	1460.82*	10.66	9.46610E+000	1.71939E+000
Pb-210	0.999	46.54*	4.25	2.66556E+000	1.11458E+000
Pb-212	0.998	74.82*	10.28	9.04892E-001	2.76934E-001
		77.11*	17.10	3.40734E-001	1.21880E-001
		86.83	2.07		
		87.35	3.97		
		89.78*	1.46	1.32351E+000	1.16325E+000
		115.18	0.60		
		238.63*	43.60	2.59440E-001	7.67851E-002
		300.09	3.30		
PB-214	0.854	74.82*	5.80	1.60384E+000	5.11388E-001
		77.11*	9.70	6.00675E-001	2.21562E-001
		86.83	1.70		
		87.35	2.24		
		89.78*	0.82	2.35649E+000	2.08122E+000
		241.99	7.25		
		258.76	0.53		
		274.80	0.35		
		295.22*	18.42	2.33841E-001	1.15043E-001
		351.93*	35.60	1.76429E-001	8.12369E-002
		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	0.993	81.07	0.20		
		83.79	0.32		
		186.21*	3.64	2.25227E+000	7.20401E-001

* = Energy line found in the spectrum.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 1.500 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	0.981	9.466100E+000	1.719389E+000
Pb-210	0.999	2.665560E+000	1.114580E+000
Pb-212	0.998	2.808098E-001	6.395169E-002
PB-214	0.854	2.045292E-001	6.389179E-002
Ra-226	0.993	2.252267E+000	7.204014E-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: 4/19/2017 10:42:25 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
M 2	73.00	1.9085E-002	50.26	Tol.	U-235

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-2120-S-P-6
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	1.516E+000	1.52E+000	9.466E+000	6.695E-00
	CO-60	1173.23	99.85	2.066E-001	1.55E-001	1.131E-001	9.544E-00
		1332.49	99.98	1.553E-001		-1.443E-001	6.888E-00
	CS-137	661.66	85.10	1.759E-001	1.76E-001	3.984E-002	8.250E-00
+	Pb-210	46.54*	4.25	2.094E+000	2.09E+000	2.666E+000	9.918E-00
	BI-212	288.20	0.34	1.961E+001	2.30E+000	6.357E+000	9.221E+00
		328.03	0.13	6.209E+001		1.599E+001	2.924E+00
		452.98	0.36	2.719E+001		-4.244E+000	1.272E+00
		727.33	6.67	2.301E+000		2.821E-002	1.074E+00
		785.37	1.10	1.192E+001		-3.669E+000	5.466E+00
		893.41	0.38	4.243E+001		1.641E+001	1.959E+00
		952.12	0.17	9.401E+001		4.953E+000	4.318E+00
		1078.62	0.56	3.160E+001		3.626E+000	1.451E+00
		1512.70	0.29	4.660E+001		2.063E+000	1.995E+00
		1620.50	1.47	8.653E+000		-3.520E+000	3.624E+00
+	Pb-212	74.82*	10.28	3.418E-001	1.17E-001	9.049E-001	1.593E-00
		77.11*	17.10	1.899E-001		3.407E-001	8.816E-00
		86.83	2.07	2.844E+000		4.079E+000	1.369E+00
		87.35	3.97	1.454E+000		1.156E+000	6.995E-00
		89.78*	1.46	2.043E+000		1.324E+000	9.479E-00
		115.18	0.60	5.986E+000		7.181E-001	2.817E+00
		238.63*	43.60	1.166E-001		2.594E-001	5.456E-00
		300.09	3.30	2.244E+000		1.841E-001	1.060E+00
	BI-214	76.86	0.55	1.314E+001	3.41E-001	3.001E+001	6.354E+00
		79.29	0.91	5.861E+000		9.017E-001	2.804E+00
		89.26	0.11	4.971E+001		1.052E+001	2.387E+00
		89.81	0.21	2.573E+001		-1.327E+001	1.235E+00
		273.80	0.13	5.066E+001		-9.948E+000	2.387E+00
		348.92	0.10	9.061E+001		-4.083E+001	4.299E+00
		386.78	0.29	2.739E+001		-7.185E+000	1.279E+00
		388.89	0.40	2.063E+001		-1.487E-001	9.647E+00
		405.72	0.17	5.560E+001		2.059E+001	2.613E+00
		454.79	0.29	3.373E+001		7.645E+000	1.577E+00
		469.77	0.13	7.024E+001		-1.903E+001	3.263E+00
		609.32	45.49	3.414E-001		3.240E-001	1.613E-00
		665.45	1.53	9.826E+000		2.983E+000	4.608E+00
		703.11	0.47	2.921E+001		2.536E+000	1.356E+00
		719.87	0.39	3.796E+001		-1.236E+001	1.769E+00
		752.85	0.13	1.140E+002		-4.013E+001	5.287E+00
		768.36	4.89	3.161E+000		1.399E+000	1.471E+00
		786.35	0.32	4.202E+001		-4.238E+001	1.930E+00
		806.18	1.26	1.041E+001		-3.932E+000	4.761E+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	1.006E+002	3.41E-001	7.812E+001	4.676E+00
		826.45	0.12	1.301E+002		-6.597E+001	6.017E+00
		934.06	3.11	5.807E+000		3.448E+000	2.698E+00
		964.08	0.37	5.124E+001		4.657E+001	2.382E+00
		1051.96	0.31	5.689E+001		-2.201E+000	2.618E+00
		1069.96	0.27	6.643E+001		-1.653E+001	3.057E+00
		1120.29	14.92	1.347E+000		2.322E-001	6.232E-00
		1133.66	0.25	8.365E+001		5.684E+001	3.881E+00
		1155.21	1.63	1.206E+001		-1.019E+001	5.558E+00
		1207.68	0.45	4.260E+001		1.376E+001	1.953E+00
		1238.11	5.83	3.948E+000		-9.251E-001	1.834E+00
		1280.98	1.43	1.258E+001		-7.371E+000	5.706E+00
		1303.75	0.11	1.712E+002		2.360E+001	7.763E+00
		1377.67	3.99	4.679E+000		1.982E+000	2.115E+00
		1385.31	0.79	2.178E+001		-7.128E+000	9.755E+00
		1401.52	1.33	1.335E+001		3.732E+000	5.991E+00
		1407.99	2.39	7.942E+000		3.208E+000	3.590E+00
		1509.21	2.13	5.860E+000		-3.925E-001	2.475E+00
		1538.53	0.40	3.321E+001		-7.935E+000	1.413E+00
		1543.34	0.30	4.852E+001		1.528E+001	2.099E+00
		1583.20	0.70	2.321E+001		1.767E+000	1.017E+00
		1594.75	0.27	6.627E+001		3.413E+001	2.932E+00
		1599.37	0.32	4.826E+001		7.373E+000	2.098E+00
		1661.27	1.05	1.243E+001		-1.230E+000	5.204E+00
		1684.01	0.21	6.953E+001		-8.126E+000	2.977E+00
		1729.59	2.88	4.691E+000		-3.631E+000	1.965E+00
		1764.49	15.30	1.498E+000		1.171E+000	6.758E-00
		1838.36	0.35	4.776E+001		-3.077E+001	2.056E+00
		1847.43	2.03	8.294E+000		2.427E+000	3.571E+00
		1873.16	0.21	6.803E+001		5.307E+000	2.849E+00
		1896.05	0.15	9.887E+001		-1.513E+001	4.141E+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	6.058E-001	2.38E-001	1.604E+000	2.824E-00
		77.11*	9.70	3.348E-001		6.007E-001	1.554E-00
		86.83	1.70	3.463E+000		4.967E+000	1.667E+00
		87.35	2.24	2.577E+000		2.048E+000	1.240E+00
		89.78*	0.82	3.638E+000		2.356E+000	1.688E+00
		241.99	7.25	1.206E+000		-5.862E-001	5.802E-00
		258.76	0.53	1.124E+001		-3.501E+000	5.288E+00
		274.80	0.35	1.824E+001		-3.991E+000	8.588E+00
		295.22*	18.42	2.383E-001		2.338E-001	1.082E-00
		351.93*	35.60	2.417E-001		1.764E-001	1.141E-00
		462.02	0.21	4.433E+001		5.634E-001	2.064E+00
		480.43	0.34	3.115E+001		1.280E+001	1.458E+00
		487.14	0.43	2.400E+001		-6.185E+000	1.121E+00
		533.66	0.18	5.702E+001		5.107E-001	2.643E+00
		580.14	0.37	3.304E+001		1.101E+001	1.542E+00
		785.96	1.06	1.268E+001		-8.616E+000	5.823E+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	2.525E+001	2.38E-001	-9.054E+000	1.163E+00
+	Ra-226	81.07	0.20	2.146E+001	1.20E+000	2.555E+000	1.015E+00
		83.79	0.32	1.609E+001		1.181E+001	7.701E+00
		186.21*	3.64	1.204E+000		2.252E+000	5.658E-00
	AC-228	89.96	1.90	1.508E+015	3.83E+014	-7.777E+014	7.237E+01
		93.35	3.10	8.116E+014		3.210E+014	3.876E+01
		99.51	1.26	1.525E+015		-9.817E+013	7.182E+01
		104.82	0.39	5.304E+015		-1.053E+015	2.510E+01
		105.60	0.74	2.882E+015		1.109E+015	1.366E+01
		108.58	0.28	7.454E+015		-2.859E+015	3.529E+01
		129.07	2.42	8.860E+014		5.033E+013	4.193E+01
		145.85	0.16	1.531E+016		-5.637E+014	7.272E+01
		153.98	0.72	3.269E+015		-9.520E+014	1.549E+01
		191.35	0.12	2.174E+016		-1.101E+016	1.029E+01
		199.41	0.31	8.893E+015		2.395E+015	4.211E+01
		204.03	0.11	2.549E+016		3.245E+015	1.207E+01
		209.25	3.89	7.331E+014		-1.909E+014	3.467E+01
		214.85	0.76	3.713E+015		4.133E+014	1.752E+01
		270.24	3.46	9.005E+014		-2.471E+014	4.219E+01
		278.95	0.16	2.235E+016		1.463E+016	1.054E+01
		321.65	0.23	1.813E+016		-6.318E+015	8.544E+01
		327.44	0.12	3.442E+016		1.469E+016	1.622E+01
		328.00	2.95	1.395E+015		3.593E+014	6.571E+01
		332.37	0.40	1.032E+016		-4.813E+015	4.858E+01
		338.32	11.27	3.832E+014		1.214E+014	1.806E+01
		340.96	0.37	1.174E+016		4.362E+015	5.532E+01
		409.46	1.92	2.452E+015		-1.029E+015	1.147E+01
		440.44	0.12	3.674E+016		-4.481E+015	1.702E+01
		463.00	4.40	1.135E+015		-8.417E+013	5.286E+01
		478.33	0.21	2.582E+016		-8.800E+015	1.206E+01
		503.82	0.18	3.042E+016		-8.659E+016	1.418E+01
		508.96	0.45	1.710E+016		1.583E+016	8.130E+01
		523.13	0.10	5.504E+016		-2.798E+016	2.563E+01
		546.47	0.20	2.905E+016		-1.124E+016	1.351E+01
		562.50	0.87	8.442E+015		2.363E+015	3.980E+01
		570.91	0.18	3.480E+016		-1.514E+016	1.623E+01
		572.14	0.15	4.202E+016		-7.629E+015	1.958E+01
		583.41	0.11	6.118E+016		2.828E+016	2.863E+01
		674.75	2.10	3.236E+015		-1.845E+015	1.498E+01
		701.75	0.17	4.078E+016		2.947E+015	1.888E+01
		707.41	0.16	5.221E+016		2.633E+016	2.441E+01
		726.86	0.62	1.303E+016		-2.413E+015	6.080E+01
		755.32	1.00	7.760E+015		3.294E+015	3.600E+01
		772.29	1.49	5.616E+015		1.184E+015	2.616E+01
		782.14	0.49	1.494E+016		-7.457E+015	6.874E+01
		794.95	4.25	2.067E+015		2.252E+015	9.644E+01
		830.49	0.54	1.475E+016		-5.405E+015	6.808E+01
		835.71	1.61	4.684E+015		2.982E+015	2.151E+01
		840.38	0.91	8.677E+015		-1.003E+015	3.999E+01
		904.20	0.77	1.148E+016		-1.960E+016	5.311E+01
		911.20	25.80	3.880E+014		1.515E+014	1.812E+01

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/gram)	Nuclide MDA (pCi/gram)	Activity (pCi/gram)	Dec. Leve (pCi/gram
AC-228	947.98	0.11	8.051E+016	3.83E+014	-1.814E+016	3.701E+01
	958.61	0.28	2.980E+016		-2.292E+014	1.366E+01
	964.77	4.99	1.973E+015		2.112E+015	9.167E+01
	968.97	15.80	6.206E+014		2.583E+014	2.881E+01
	1033.25	0.20	4.719E+016		-8.780E+015	2.175E+01
	1065.18	0.13	7.083E+016		-2.226E+016	3.253E+01
	1095.68	0.13	7.017E+016		-7.434E+016	3.206E+01
	1110.61	0.28	4.147E+016		1.293E+016	1.935E+01
	1153.52	0.14	7.650E+016		-5.083E+016	3.532E+01
	1247.08	0.50	2.252E+016		4.834E+014	1.039E+01
	1459.14	0.83	2.956E+016		7.861E+016	1.418E+01
	1495.91	0.86	8.542E+015		2.436E+015	3.678E+01
	1501.57	0.46	1.371E+016		-1.097E+016	5.740E+01
	1557.11	0.18	4.276E+016		3.292E+015	1.841E+01
	1580.53	0.60	1.285E+016		-6.598E+015	5.534E+01
	1588.20	3.22	2.967E+015		2.106E+015	1.316E+01
	1625.06	0.25	3.101E+016		1.857E+015	1.335E+01
	1630.63	1.51	5.423E+015		-3.670E+015	2.347E+01
	1638.28	0.47	1.854E+016		7.056E+015	8.095E+01
	1666.52	0.18	4.064E+016		-1.516E+015	1.716E+01
TH-230	67.67	0.38	1.330E+001	1.33E+001	-7.234E+000	6.304E+00
PA-234	742.81	0.11	1.395E+002	2.17E+001	-8.565E+001	6.488E+00
	766.42	0.32	4.831E+001		6.680E+000	2.247E+00
	1001.03	0.84	2.165E+001		9.778E+000	1.002E+00
TH-234	63.29	3.70	1.612E+000	1.61E+000	1.387E+000	7.682E-00
	92.38	2.13	2.471E+000		9.636E-001	1.185E+00
	92.80	2.10	2.478E+000		1.527E+000	1.188E+00
	112.81	0.21	1.740E+001		-1.786E+000	8.202E+00
U-234	53.20	0.12	4.785E+001	4.78E+001	-1.457E+000	2.244E+00
	120.90	0.04	1.088E+002		-8.129E+000	5.138E+00
U-235	72.70	0.12	4.881E+001	4.02E-001	6.387E+000	2.339E+00
	89.96	3.43	1.575E+000		-8.123E-001	7.559E-00
	93.35	5.54	8.562E-001		3.387E-001	4.089E-00
	104.82	0.69	5.694E+000		-1.130E+000	2.694E+00
	105.60	1.31	3.069E+000		1.182E+000	1.455E+00
	108.58	0.50	7.871E+000		-3.019E+000	3.726E+00
	109.19	1.66	2.318E+000		-1.143E+000	1.096E+00
	140.76	0.20	2.108E+001		4.594E+000	9.983E+00
	143.76	10.96	4.018E-001		5.040E-002	1.906E-00
	163.36	5.08	8.672E-001		2.202E-001	4.098E-00
	182.62	0.39	1.547E+001		-7.368E+000	7.401E+00
	194.94	0.63	8.550E+000		4.252E+000	4.057E+00
	202.12	1.08	4.923E+000		2.288E+000	2.331E+00
	205.32	5.02	1.054E+000		-4.275E-001	4.984E-00
	221.39	0.12	4.420E+001		-1.390E+001	2.080E+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-2120\W6H-IMC-212

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	^	9.47E+000	18.164			
Pb-210	46.5	^	2.67E+000	41.814			
Pb-212	74.8		9.05E-001	30.604	3.488[42.574]	4.21	-0.767
	77.1		3.41E-001	35.770	1.313[46.427]		[0.453]
	89.8		1.32E+000	87.892	5.101[92.741]		
	238.6	^	2.59E-001	29.596	1.000[41.856]		
PB-214	74.8		1.60E+000	31.885	9.091[56.007]	7.05	-1.195
	77.1		6.01E-001	36.886	3.405[58.997]		[0.419]
	89.8		2.36E+000	88.319	13.357[99.601]		
	295.2		2.34E-001	49.197	1.325[67.383]		
	351.9	^	1.76E-001	46.045	1.000[65.118]		
Ra-226	186.2	^	2.25E+000	31.986			