
***** G A M M A S P E C T R U M A N A L Y S I S *****

Filename: C:\GENIE2K\CAMFILES\UNC 2017\IMC Samples\IMC-2079\W6H-IMC-207

Report Generated On : 5/1/2017 9:58:10 AM

Sample Title : W6H-IMC-2079-S-P-5

Sample Description :

Sample Identification : 2079-S-P-5

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 : 2.732E+002 grams

Sample Taken On : 3/17/2017 12:00:00 AM

Acquisition Started : 3/31/2017 11:12:35 AM

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 : 5/1/2017

Efficiency ID : H-IMC-2079-S-P-5

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

Detector Name: 8566

Sample Title: W6H-IMC-2079-S-P-5

Peak Analysis Performed on: 5/1/2017 9:58:05 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
M	1	296-	314	299.20	75.01	0.65	6.46E+001	20.78	5.95E+001
m	2	296-	314	308.73	77.40	0.65	4.48E+001	17.94	6.32E+001
F	3	346-	354	348.48	87.34	0.49	2.03E+001	12.51	3.45E+001
F	4	738-	750	741.97	185.77	0.56	3.38E+001	15.04	5.04E+001
F	5	944-	960	952.65	238.47	1.21	6.51E+001	20.91	5.95E+001
F	6	1400-	1411	1405.20	351.68	0.96	2.74E+001	14.07	2.64E+001
F	7	5825-	5850	5836.79	1460.22	2.63	1.48E+002	22.78	5.78E+000

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: W6H-IMC-2079-S-P-5
 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	0.945	1460.82*	10.66	9.01128E+000	1.58155E+000
Pb-212	0.994	74.82*	10.28	5.30075E-001	2.01232E-001
		77.11*	17.10	2.15465E-001	9.66247E-002
		86.83	2.07		
		87.35*	3.97	3.92499E-001	2.54411E-001
		89.78	1.46		
		115.18	0.60		
		238.63*	43.60	1.69361E-001	6.06809E-002
		300.09	3.30		
PB-214	0.661	74.82*	5.80	9.39512E-001	3.66438E-001
		77.11*	9.70	3.79841E-001	1.73737E-001
		86.83	1.70		
		87.35*	2.24	6.95634E-001	4.54793E-001
		89.78	0.82		
		241.99	7.25		
		258.76	0.53		
		274.80	0.35		
		295.22	18.42		
		351.93*	35.60	1.28963E-001	6.88887E-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	0.973	81.07	0.20		
		83.79	0.32		
		186.21*	3.64	8.53533E-001	4.06385E-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

***** 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	0.945	9.011281E+000	1.581554E+000
Pb-212	0.994	1.831014E-001	5.037906E-002
PB-214	0.661	1.389205E-001	6.433264E-002
Ra-226	0.973	8.535327E-001	4.063854E-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: 5/1/2017 9:58:05 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
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All peaks were identified.

***** 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-2079-S-P-5
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	9.150E-001	9.15E-001	9.011E+000	3.754E-00
	CO-60	1173.23	99.85	1.888E-001	1.79E-001	1.216E-002	8.708E-00
		1332.49	99.98	1.794E-001		3.074E-002	8.158E-00
	CS-137	661.66	85.10	1.427E-001	1.43E-001	-2.694E-004	6.624E-00
	Pb-210	46.54	4.25	2.204E+000	2.20E+000	1.772E+000	1.047E+00
	BI-212	288.20	0.34	1.697E+001	2.01E+000	-3.321E+000	7.939E+00
		328.03	0.13	5.623E+001		-1.870E+001	2.643E+00
		452.98	0.36	2.458E+001		-8.033E-001	1.147E+00
		727.33	6.67	2.007E+000		-4.472E-001	9.322E-00
		785.37	1.10	1.207E+001		-5.669E+000	5.571E+00
		893.41	0.38	3.954E+001		-1.553E+001	1.825E+00
		952.12	0.17	8.568E+001		-4.597E+001	3.927E+00
		1078.62	0.56	2.941E+001		3.376E+000	1.351E+00
		1512.70	0.29	4.770E+001		2.596E+001	2.074E+00
		1620.50	1.47	9.403E+000		-1.341E+000	4.048E+00
+	Pb-212	74.82*	10.28	3.167E-001	1.24E-001	5.301E-001	1.472E-00
		77.11*	17.10	1.910E-001		2.155E-001	8.900E-00
		86.83	2.07	2.219E+000		3.717E-001	1.059E+00
		87.35*	3.97	6.429E-001		3.925E-001	2.953E-00
		89.78	1.46	2.929E+000		-1.854E+000	1.394E+00
		115.18	0.60	6.196E+000		1.956E+000	2.931E+00
		238.63*	43.60	1.238E-001		1.694E-001	5.840E-00
		300.09	3.30	1.921E+000		-1.487E+000	9.022E-00
	BI-214	76.86	0.55	1.110E+001	2.85E-001	1.794E+001	5.345E+00
		79.29	0.91	5.172E+000		1.354E+000	2.465E+00
		89.26	0.11	3.883E+001		1.175E+001	1.848E+00
		89.81	0.21	2.036E+001		-1.289E+001	9.693E+00
		273.80	0.13	4.843E+001		4.153E+000	2.285E+00
		348.92	0.10	7.795E+001		-5.307E+001	3.681E+00
		386.78	0.29	2.684E+001		-2.324E+000	1.257E+00
		388.89	0.40	1.981E+001		1.715E+000	9.276E+00
		405.72	0.17	4.254E+001		-3.216E+001	1.971E+00
		454.79	0.29	3.046E+001		3.384E+000	1.421E+00
		469.77	0.13	6.563E+001		5.736E+000	3.049E+00
		609.32	45.49	2.848E-001		-4.878E-003	1.336E-00
		665.45	1.53	7.704E+000		2.678E+000	3.567E+00
		703.11	0.47	2.442E+001		-1.111E+001	1.124E+00
		719.87	0.39	3.128E+001		-4.034E+001	1.444E+00
		752.85	0.13	1.071E+002		6.675E+000	4.974E+00
		768.36	4.89	3.058E+000		2.782E+000	1.427E+00
		786.35	0.32	4.276E+001		5.476E+000	1.979E+00
		806.18	1.26	9.928E+000		-1.307E+001	4.551E+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	8.440E+001	2.85E-001	-9.756E+000	3.890E+00
	826.45	0.12	1.168E+002		6.029E+001	5.384E+00
	934.06	3.11	5.051E+000		4.306E+000	2.333E+00
	964.08	0.37	4.810E+001		2.754E+001	2.237E+00
	1051.96	0.31	5.560E+001		1.689E+001	2.569E+00
	1069.96	0.27	6.121E+001		1.527E+001	2.814E+00
	1120.29	14.92	1.265E+000		6.462E-001	5.857E-00
	1133.66	0.25	6.667E+001		3.553E+001	3.053E+00
	1155.21	1.63	1.176E+001		3.264E+000	5.441E+00
	1207.68	0.45	4.422E+001		3.087E+001	2.046E+00
	1238.11	5.83	3.233E+000		-3.130E-001	1.486E+00
	1280.98	1.43	1.281E+001		2.017E-001	5.860E+00
	1303.75	0.11	1.547E+002		-6.585E+001	6.992E+00
	1377.67	3.99	4.008E+000		-6.002E-001	1.795E+00
	1385.31	0.79	2.231E+001		1.256E+001	1.010E+00
	1401.52	1.33	1.080E+001		1.931E+000	4.763E+00
	1407.99	2.39	6.022E+000		1.019E-001	2.657E+00
	1509.21	2.13	6.291E+000		8.861E-001	2.722E+00
	1538.53	0.40	3.204E+001		8.511E-001	1.372E+00
	1543.34	0.30	4.220E+001		9.716E+000	1.807E+00
	1583.20	0.70	2.266E+001		-1.150E+001	9.995E+00
	1594.75	0.27	6.021E+001		-1.892E+000	2.656E+00
	1599.37	0.32	4.613E+001		-8.056E+000	2.014E+00
	1661.27	1.05	1.207E+001		-4.504E-001	5.098E+00
	1684.01	0.21	5.446E+001		1.528E+001	2.259E+00
	1729.59	2.88	4.359E+000		-1.465E+000	1.826E+00
	1764.49	15.30	1.179E+000		6.366E-001	5.215E-00
	1838.36	0.35	4.582E+001		1.526E+001	1.983E+00
	1847.43	2.03	7.706E+000		-2.077E+000	3.318E+00
	1873.16	0.21	7.140E+001		1.631E+001	3.057E+00
	1896.05	0.15	1.038E+002		-1.874E+001	4.442E+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	5.613E-001	1.31E-001	9.395E-001	2.610E-00
	77.11*	9.70	3.368E-001		3.798E-001	1.569E-00
	86.83	1.70	2.701E+000		4.526E-001	1.290E+00
	87.35*	2.24	1.139E+000		6.956E-001	5.234E-00
	89.78	0.82	5.216E+000		-3.300E+000	2.483E+00
	241.99	7.25	9.886E-001		2.579E-001	4.728E-00
	258.76	0.53	1.024E+001		-6.584E+000	4.807E+00
	274.80	0.35	1.708E+001		-9.420E+000	8.045E+00
	295.22	18.42	3.365E-001		-1.443E-001	1.580E-00
	351.93*	35.60	1.308E-001		1.290E-001	5.903E-00
	462.02	0.21	3.919E+001		-3.203E+001	1.817E+00
	480.43	0.34	2.589E+001		5.634E+000	1.201E+00
	487.14	0.43	2.180E+001		1.365E+000	1.016E+00
	533.66	0.18	5.095E+001		1.288E+001	2.354E+00
	580.14	0.37	3.275E+001		1.142E+001	1.534E+00
	785.96	1.06	1.267E+001		-1.652E+000	5.854E+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	2.282E+001	1.31E-001	2.012E+000	1.048E+00
+	Ra-226	81.07	0.20	1.805E+001	1.02E+000	-1.018E+001	8.472E+00
		83.79	0.32	1.391E+001		1.733E+001	6.625E+00
		186.21*	3.64	1.024E+000		8.535E-001	4.776E-00
	AC-228	89.96	1.90	2.288E+017	6.44E+016	-1.448E+017	1.089E+01
		93.35	3.10	1.410E+017		-1.253E+017	6.716E+01
		99.51	1.26	2.733E+017		-5.860E+016	1.286E+01
		104.82	0.39	8.634E+017		4.787E+016	4.058E+01
		105.60	0.74	4.651E+017		1.816E+017	2.189E+01
		108.58	0.28	1.242E+018		-8.971E+017	5.848E+01
		129.07	2.42	1.328E+017		-7.211E+016	6.213E+01
		145.85	0.16	2.411E+018		-8.913E+016	1.136E+01
		153.98	0.72	5.196E+017		3.151E+016	2.443E+01
		191.35	0.12	3.754E+018		4.275E+017	1.772E+01
		199.41	0.31	1.558E+018		5.841E+017	7.368E+01
		204.03	0.11	4.466E+018		-3.538E+018	2.111E+01
		209.25	3.89	1.343E+017		-3.336E+016	6.359E+01
		214.85	0.76	6.714E+017		-2.628E+017	3.170E+01
		270.24	3.46	1.753E+017		1.016E+017	8.258E+01
		278.95	0.16	4.134E+018		1.469E+018	1.953E+01
		321.65	0.23	2.784E+018		-3.162E+018	1.299E+01
		327.44	0.12	5.980E+018		9.231E+017	2.812E+01
		328.00	2.95	2.423E+017		-8.061E+016	1.139E+01
		332.37	0.40	1.912E+018		7.835E+017	9.015E+01
		338.32	11.27	6.439E+016		-2.107E+016	3.023E+01
		340.96	0.37	2.006E+018		6.934E+017	9.424E+01
		409.46	1.92	3.878E+017		-2.397E+017	1.798E+01
		440.44	0.12	7.231E+018		1.919E+018	3.374E+01
		463.00	4.40	1.973E+017		-5.345E+016	9.164E+01
		478.33	0.21	4.011E+018		-5.257E+017	1.853E+01
		503.82	0.18	4.814E+018		-5.436E+018	2.222E+01
		508.96	0.45	2.627E+018		1.836E+018	1.238E+01
		523.13	0.10	9.861E+018		3.551E+018	4.591E+01
		546.47	0.20	5.202E+018		2.014E+018	2.419E+01
		562.50	0.87	1.188E+018		5.589E+017	5.510E+01
		570.91	0.18	5.036E+018		-6.199E+017	2.308E+01
		572.14	0.15	6.326E+018		2.638E+018	2.908E+01
		583.41	0.11	1.164E+019		8.634E+018	5.470E+01
		674.75	2.10	5.583E+017		3.505E+017	2.577E+01
		701.75	0.17	6.766E+018		-1.069E+018	3.113E+01
		707.41	0.16	8.625E+018		4.599E+018	4.009E+01
		726.86	0.62	2.230E+018		2.302E+017	1.037E+01
		755.32	1.00	1.388E+018		3.196E+017	6.438E+01
		772.29	1.49	9.269E+017		5.068E+016	4.291E+01
		782.14	0.49	2.560E+018		-7.876E+017	1.173E+01
		794.95	4.25	3.535E+017		-8.407E+016	1.644E+01
		830.49	0.54	2.535E+018		9.128E+017	1.166E+01
		835.71	1.61	8.462E+017		3.745E+017	3.890E+01
		840.38	0.91	1.457E+018		-1.217E+017	6.677E+01
		904.20	0.77	2.192E+018		-1.495E+018	1.019E+01
		911.20	25.80	7.445E+016		7.249E+016	3.493E+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	1.408E+019	6.44E+016	-4.097E+018	6.460E+01
	958.61	0.28	5.382E+018		-4.402E+017	2.469E+01
	964.77	4.99	3.581E+017		2.368E+017	1.665E+01
	968.97	15.80	1.161E+017		1.040E+017	5.410E+01
	1033.25	0.20	8.428E+018		-7.002E+017	3.884E+01
	1065.18	0.13	1.209E+019		-1.499E+019	5.531E+01
	1095.68	0.13	1.159E+019		-2.869E+018	5.253E+01
	1110.61	0.28	5.667E+018		-2.296E+018	2.586E+01
	1153.52	0.14	1.326E+019		-7.282E+018	6.108E+01
	1247.08	0.50	3.040E+018		-2.897E+018	1.364E+01
	1459.14	0.83	5.163E+018		1.220E+019	2.474E+01
	1495.91	0.86	1.667E+018		8.686E+016	7.275E+01
	1501.57	0.46	3.126E+018		-3.829E+017	1.365E+01
	1557.11	0.18	6.520E+018		-3.978E+018	2.731E+01
	1580.53	0.60	2.640E+018		-1.490E+018	1.161E+01
	1588.20	3.22	5.060E+017		1.578E+017	2.232E+01
	1625.06	0.25	6.211E+018		2.585E+018	2.721E+01
	1630.63	1.51	1.130E+018		3.925E+017	5.000E+01
	1638.28	0.47	3.305E+018		1.258E+018	1.443E+01
	1666.52	0.18	7.243E+018		-2.703E+017	3.059E+01
TH-230	67.67	0.38	1.146E+001	1.15E+001	-4.483E-001	5.397E+00
PA-234	742.81	0.11	1.281E+002	1.94E+001	-3.766E+001	5.949E+00
	766.42	0.32	4.574E+001		1.702E+001	2.130E+00
TH-234	1001.03	0.84	1.943E+001	1.34E+000	-6.986E+000	8.963E+00
	63.29	3.70	1.344E+000		1.196E+000	6.353E-00
	92.38	2.13	2.210E+000		3.263E+000	1.057E+00
	92.80	2.10	2.186E+000		1.518E+000	1.045E+00
	112.81	0.21	1.731E+001		4.490E+000	8.180E+00
U-234	53.20	0.12	4.812E+001	4.81E+001	-5.158E+000	2.262E+00
	120.90	0.04	9.171E+001		-2.173E+001	4.299E+00
U-235	72.70	0.12	4.521E+001	3.61E-001	-7.697E+000	2.163E+00
	89.96	3.43	1.246E+000		-7.884E-001	5.931E-00
	93.35	5.54	7.755E-001		-6.895E-001	3.695E-00
	104.82	0.69	4.833E+000		2.679E-001	2.271E+00
	105.60	1.31	2.583E+000		1.008E+000	1.216E+00
	108.58	0.50	6.836E+000		-4.939E+000	3.220E+00
	109.19	1.66	2.081E+000		-1.230E+000	9.807E-00
	140.76	0.20	1.970E+001		-2.530E+000	9.323E+00
	143.76	10.96	3.612E-001		3.585E-002	1.709E-00
	163.36	5.08	7.598E-001		-2.320E-001	3.575E-00
	182.62	0.39	1.316E+001		-9.512E+000	6.267E+00
	194.94	0.63	7.418E+000		-9.272E-001	3.504E+00
	202.12	1.08	4.662E+000		-6.364E-001	2.208E+00
	205.32	5.02	1.003E+000		2.328E-001	4.746E-00
	221.39	0.12	4.078E+001		5.620E-001	1.917E+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

 *** LINE ACTIVITY CONSISTENCY EVALUATOR ***

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 Analysis using Key Line Activities
 =====

Filename: C:\GENIE2K\CAMFILES\UNC 2017\IMC Samples\IMC-2079\W6H-IMC-207

Equation used to calculate plot: $\ln(\text{Ratio}) = A + B \cdot \ln(\text{Energy})$
 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]
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K-40	1460.8	^	9.01E+000	17.551			
Pb-212	74.8		5.30E-001	37.963	3.130[52.201]	3.71	-0.679 [0.546]
	77.1		2.15E-001	44.845	1.272[57.400]		
	87.3		3.92E-001	64.818	2.318[74.062]		
	238.6	^	1.69E-001	35.829	1.000[50.670]		
PB-214	74.8		9.40E-001	39.003	7.285[66.141]	6.20	-1.057 [0.574]
	77.1		3.80E-001	45.739	2.945[70.324]		
	87.3		6.96E-001	65.378	5.394[84.426]		
	351.9	^	1.29E-001	53.418	1.000[75.544]		
Ra-226	186.2	^	8.54E-001	47.612			