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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-2165\W3H-IMC-216

Report Generated On : 7/6/2017 9:39:15 AM

Sample Title : W3H-IMC-2165-S-P-7
Sample Description :
Sample Identification : IMC-2165-S-P-7
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 : 3.443E+002 grams

Sample Taken On : 5/1/2017 12:00:00 AM
Acquisition Started : 5/15/2017 9:59:03 AM

Live Time : 1800.0 seconds
Real Time : 1800.6 seconds

Dead Time : 0.03 %

Energy Calibration Used Done On : 4/13/2017
Efficiency Calibration Used Done On : 7/6/2017
Efficiency ID : H-IMC-2002-S-P-5

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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: W3H-IMC-2165-S-P-7
Peak Analysis Performed on: 7/6/2017 9:39:11 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	58-	70	65.13	16.41	0.95	2.33E+002	113.10	1.56E+002
F	2	95-	107	102.99	25.88	0.63	7.73E+001	52.07	9.75E+001
F	3	205-	219	213.43	53.52	0.64	8.85E+001	60.59	1.18E+002
M	4	295-	316	299.55	75.07	0.63	1.57E+002	30.13	2.15E+002
m	5	295-	316	308.29	77.26	0.64	1.25E+002	26.77	2.21E+002
F	6	332-	343	336.99	84.44	0.79	2.29E+002	30.67	1.74E+002
F	7	354-	364	360.19	90.25	0.83	1.35E+002	25.04	1.28E+002
F	8	366-	377	373.17	93.49	0.77	1.93E+002	94.88	1.42E+002
F	9	431-	444	436.16	109.26	0.85	6.42E+001	20.09	1.45E+002
F	10	566-	580	574.50	143.88	0.81	2.86E+002	97.98	1.37E+002
F	11	644-	660	652.49	163.39	0.88	1.42E+002	79.60	1.38E+002
F	12	734-	748	741.82	185.75	0.92	1.33E+003	68.48	9.56E+001
F	13	814-	825	819.89	205.28	0.89	9.65E+001	21.71	6.45E+001
F	14	947-	958	952.53	238.48	1.02	1.38E+002	25.50	7.35E+001
F	15	1174-	1184	1178.94	295.13	0.87	5.34E+001	17.44	3.63E+001
F	16	1344-	1356	1351.11	338.22	0.89	3.00E+001	13.19	2.34E+001
F	17	1401-	1414	1405.90	351.93	1.08	6.93E+001	19.41	4.34E+001
F	18	2031-	2047	2038.64	510.27	1.44	6.00E+001	63.57	4.39E+001
F	19	2321-	2336	2328.57	582.82	1.58	4.88E+001	16.27	2.13E+001
F	20	2424-	2439	2432.04	608.72	1.32	5.06E+001	42.49	2.00E+001
F	21	5822-	5852	5836.28	1460.61	2.67	2.29E+002	30.57	8.61E+000
F	22	7044-	7059	7051.96	1764.83	1.41	1.56E+001	8.88	1.60E+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: W3H-IMC-2165-S-P-7
Nuclide Library Used: C:\GENIE2K\CAMFILES\UNC 2017 NLB 0328201

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

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/gram)	Activity Uncertainty
K-40	0.993	1460.82*	10.66	1.09840E+001	1.67125E+000
Pb-212	0.995	74.82*	10.28	9.94779E-001	2.33614E-001
		77.11*	17.10	4.66845E-001	1.17793E-001
		86.83	2.07		
		87.35	3.97		
		89.78*	1.46	5.46458E+000	1.21429E+000
		115.18	0.60		
		238.63*	43.60	2.81723E-001	5.94129E-002
		300.09	3.30		
BI-214	0.349	76.86*	0.55	1.46478E+001	3.71926E+000
		79.29	0.91		
		609.32*	45.49	2.59220E-001	2.18421E-001
		665.45	1.53		
		768.36	4.89		
		806.18	1.26		
		934.06	3.11		
		1120.29	14.92		
		1155.21	1.63		
		1238.11	5.83		
		1280.98	1.43		
		1377.67	3.99		
		1385.31	0.79		
		1401.52	1.33		
		1407.99	2.39		
		1509.21	2.13		
		1583.20	0.70		
		1661.27	1.05		
		1729.59	2.88		
		1764.49*	15.30	6.18705E-001	3.53683E-001
		1847.43	2.03		
		2118.51	1.16		
		2204.06	4.92		
		2447.70	1.55		
PB-214	0.851	74.82*	5.80	1.76316E+000	4.43096E-001
		77.11*	9.70	8.22995E-001	2.20478E-001
		86.83	1.70		
		87.35	2.24		
		89.78*	0.82	9.72962E+000	2.32082E+000
		241.99	7.25		
		258.76	0.53		
		295.22*	18.42	3.18975E-001	1.07958E-001
		351.93*	35.60	2.57006E-001	7.51177E-002

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/gram)	Activity Uncertainty
PB-214	0.851	785.96	1.06		
		839.07	0.58		
Ra-226	0.885	81.07	0.20		
		83.79*	0.32	4.28919E+001	7.94567E+000
		186.21*	3.64	2.64422E+001	3.11343E+000
U-234	0.987	53.20*	0.12	7.16219E+001	5.02819E+001
		120.90	0.04		
U-235	0.997	89.96*	3.43	2.32599E+000	5.22188E-001
		93.35*	5.54	2.03166E+000	1.02984E+000
		104.82	0.69		
		105.60	1.31		
		108.58	0.50		
		109.19*	1.66	2.21343E+000	8.06552E-001
		143.76*	10.96	1.60866E+000	5.75910E-001
		163.36*	5.08	1.84485E+000	1.05275E+000
		194.94	0.63		
		202.12	1.08		
		205.32*	5.02	1.50118E+000	3.72907E-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	0.993	1.098399E+001	1.671250E+000
Pb-212	0.995	3.118678E-001	5.192620E-002
BI-214	0.349	3.564880E-001	1.856501E-001
PB-214	0.851	2.957199E-001	5.915300E-002
Ra-226	0.885	2.863168E+001	2.898828E+000
U-234	0.987	7.162192E+001	5.028191E+001
U-235	0.997	1.773950E+000	2.365470E-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: 7/6/2017 9:39:11 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	1	16.41	1.2924E-001	48.62		
F	2	25.88	4.2946E-002	67.35		
F	16	338.22	1.6694E-002	43.90		
F	18	510.27	3.3346E-002	105.91		
F	19	582.82	2.7108E-002	33.33		

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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***** NUCLIDE MDA REPORT *****
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Detector Name: 8566
Sample Geometry: cylinder
Sample Title: W3H-IMC-2165-S-P-7
Nuclide Library Used: C:\GENIE2K\CAMFILES\UNC 2017 NLB 0328201

	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	8.940E-001	8.94E-001	1.098E+001	3.821E-00
	Pb-210	46.54	4.25	1.920E+000	1.92E+000	2.179E+000	9.181E-00
	BI-212	727.33	6.67	1.750E+000	1.75E+000	-2.074E-001	8.189E-00
		785.37	1.10	1.160E+001		1.237E+001	5.435E+00
		1078.62	0.56	2.419E+001		-2.010E+000	1.115E+00
		1620.50	1.47	8.129E+000		-4.729E+000	3.549E+00
+	Pb-212	74.82*	10.28	4.510E-001	9.68E-002	9.948E-001	2.169E-00
		77.11*	17.10	2.688E-001		4.668E-001	1.294E-00
		86.83	2.07	2.934E+000		1.281E+000	1.428E+00
		87.35	3.97	1.343E+000		6.663E-001	6.513E-00
		89.78*	1.46	2.641E+000		5.465E+000	1.266E+00
		115.18	0.60	7.488E+000		-3.121E+000	3.613E+00
		238.63*	43.60	9.679E-002		2.817E-001	4.562E-00
		300.09	3.30	1.826E+000		-1.864E+000	8.673E-00
+	BI-214	76.86*	0.55	8.435E+000	1.29E-001	1.465E+001	4.059E+00
		79.29	0.91	6.984E+000		-2.770E-001	3.398E+00
		609.32*	45.49	1.289E-001		2.592E-001	5.753E-00
		665.45	1.53	7.357E+000		4.363E+000	3.454E+00
		768.36	4.89	2.359E+000		-3.699E-001	1.099E+00
		806.18	1.26	8.813E+000		-1.273E+000	4.080E+00
		934.06	3.11	4.058E+000		1.203E+000	1.877E+00
		1120.29	14.92	1.166E+000		8.752E-001	5.463E-00
		1155.21	1.63	9.448E+000		1.136E+000	4.377E+00
		1238.11	5.83	3.036E+000		6.749E-001	1.415E+00
		1280.98	1.43	9.876E+000		-2.707E+000	4.507E+00
		1377.67	3.99	3.331E+000		1.598E+000	1.501E+00
		1385.31	0.79	1.710E+001		4.107E+000	7.717E+00
		1401.52	1.33	8.528E+000		-3.998E+000	3.762E+00
		1407.99	2.39	5.177E+000		-6.323E-001	2.309E+00
		1509.21	2.13	6.182E+000		2.841E+000	2.757E+00
		1583.20	0.70	1.748E+001		-1.670E+001	7.686E+00
		1661.27	1.05	8.688E+000		2.382E+000	3.603E+00
		1729.59	2.88	4.525E+000		3.514E+000	1.983E+00
		1764.49*	15.30	3.284E-001		6.187E-001	1.106E-00
		1847.43	2.03	7.186E+000		1.125E+000	3.170E+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
>		2447.70	1.55	0.000E+000		0.000E+000	0.000E+00
+	PB-214	74.82*	5.80	7.994E-001	1.35E-001	1.763E+000	3.845E-00
		77.11*	9.70	4.739E-001		8.230E-001	2.280E-00
		86.83	1.70	3.572E+000		1.560E+000	1.738E+00
		87.35	2.24	2.381E+000		1.181E+000	1.154E+00

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/gram)	Nuclide MDA (pCi/gram)	Activity (pCi/gram)	Dec. Leve (pCi/gram
+	PB-214	89.78*	0.82	4.703E+000	1.35E-001	9.730E+000	2.254E+00
		241.99	7.25	1.012E+000		-7.063E-001	4.890E-00
		258.76	0.53	9.513E+000		6.066E+000	4.511E+00
		295.22*	18.42	1.876E-001		3.190E-001	8.574E-00
		351.93*	35.60	1.345E-001		2.570E-001	6.225E-00
		785.96	1.06	1.192E+001		9.241E+000	5.578E+00
		839.07	0.58	2.271E+001		6.888E+000	1.062E+00
+	Ra-226	81.07	0.20	2.675E+001	1.13E+000	-2.371E+000	1.295E+00
		83.79*	0.32	1.461E+001		4.289E+001	7.051E+00
		186.21*	3.64	1.135E+000		2.644E+001	5.405E-00
	AC-228	89.96	1.90	2.694E+017	5.02E+016	2.402E+017	1.310E+01
		93.35	3.10	1.697E+017		2.267E+017	8.261E+01
		99.51	1.26	2.831E+017		-4.046E+015	1.361E+01
		105.60	0.74	5.446E+017		2.502E+017	2.630E+01
		129.07	2.42	1.635E+017		2.835E+016	7.882E+01
		153.98	0.72	5.385E+017		2.112E+017	2.587E+01
		209.25	3.89	1.196E+017		-3.073E+016	5.735E+01
		214.85	0.76	5.297E+017		-2.354E+017	2.520E+01
		270.24	3.46	1.355E+017		7.730E+014	6.428E+01
		328.00	2.95	1.838E+017		9.574E+016	8.694E+01
		338.32	11.27	5.016E+016		1.742E+016	2.373E+01
		409.46	1.92	3.501E+017		1.222E+017	1.654E+01
		463.00	4.40	1.582E+017		9.342E+016	7.428E+01
		562.50	0.87	9.994E+017		5.479E+017	4.701E+01
		674.75	2.10	4.111E+017		1.087E+017	1.909E+01
		726.86	0.62	1.688E+018		1.581E+017	7.908E+01
		755.32	1.00	1.071E+018		2.558E+017	5.014E+01
		772.29	1.49	6.999E+017		-7.334E+016	3.264E+01
		794.95	4.25	2.592E+017		-1.343E+015	1.211E+01
		830.49	0.54	2.137E+018		-1.467E+017	9.992E+01
		835.71	1.61	7.306E+017		3.637E+017	3.418E+01
		840.38	0.91	1.291E+018		7.281E+017	6.036E+01
		904.20	0.77	1.702E+018		-1.855E+018	7.986E+01
		911.20	25.80	5.724E+016		6.516E+016	2.704E+01
		964.77	4.99	2.848E+017		1.362E+017	1.338E+01
		968.97	15.80	8.978E+016		3.398E+016	4.216E+01
		1247.08	0.50	2.683E+018		-8.009E+017	1.234E+01
		1459.14	0.83	4.232E+018		1.352E+019	2.042E+01
		1495.91	0.86	1.115E+018		-1.943E+017	4.847E+01
		1588.20	3.22	4.004E+017		2.744E+017	1.797E+01
		1630.63	1.51	7.240E+017		9.261E+016	3.173E+01
	TH-230	67.67	0.38	1.493E+001	1.49E+001	-3.621E+000	7.209E+00
	PA-234	742.81	0.11	1.049E+002	1.63E+001	3.177E+001	4.889E+00
		766.42	0.32	3.580E+001		-2.089E+001	1.666E+00
		1001.03	0.84	1.633E+001		1.632E+001	7.571E+00
	TH-234	63.29	3.70	1.653E+000	1.65E+000	2.409E-001	7.979E-00
		92.38	2.13	3.068E+000		3.634E+000	1.497E+00
		92.80	2.10	3.012E+000		3.570E+000	1.468E+00
		112.81	0.21	2.124E+001		-3.644E-001	1.025E+00
+	U-234	53.20*	0.12	5.617E+001	5.62E+001	7.162E+001	2.699E+00
		120.90	0.04	1.330E+002		-3.480E+001	6.428E+00

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/gram)	Nuclide MDA (pCi/gram)	Activity (pCi/gram)	Dec. Leve (pCi/gram
+	U-235	89.96*	3.43	1.124E+000	3.82E-001	2.326E+000	5.389E-00
		93.35*	5.54	7.430E-001		2.032E+000	3.572E-00
		104.82	0.69	6.736E+000		4.181E+000	3.255E+00
		105.60	1.31	3.472E+000		1.595E+000	1.677E+00
		108.58	0.50	1.000E+001		-9.162E-001	4.847E+00
		109.19*	1.66	2.586E+000		2.213E+000	1.246E+00
		143.76*	10.96	3.819E-001		1.609E+000	1.833E-00
		163.36*	5.08	9.235E-001		1.845E+000	4.442E-00
		194.94	0.63	7.250E+000		-3.744E+000	3.464E+00
		202.12	1.08	5.445E+000		-9.638E-001	2.626E+00
		205.32*	5.02	6.921E-001		1.501E+000	3.250E-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-2165\W3H-IMC-216

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	^	1.10E+001	15.215			
Pb-212	74.8		9.95E-001	23.484	3.531[31.563]	7.02	-1.244
	77.1		4.67E-001	25.232	1.657[32.884]		[0.319]
	89.8		5.46E+000	22.221	19.397[30.635]		
	238.6	^	2.82E-001	21.089	1.000[29.825]		
BI-214	76.9		1.46E+001	25.391	56.507[88.004]	8.74	-1.143
	609.3	^	2.59E-001	84.261	1.000[119.16]		[0.419]
	1764.5		6.19E-001	57.165	2.387[101.82]		
PB-214	74.8		1.76E+000	25.131	6.860[38.547]	8.53	-1.439
	77.1		8.23E-001	26.790	3.202[39.648]		[0.268]
	89.8		9.73E+000	23.853	37.858[37.726]		
	295.2		3.19E-001	33.845	1.241[44.719]		
	351.9	^	2.57E-001	29.228	1.000[41.335]		
Ra-226	83.8		4.29E+001	18.525	1.622[21.950]	3.17	-0.606
	186.2	^	2.64E+001	11.774	1.000[16.652]		[0.345]
U-234	53.2	^	7.16E+001	70.205			
U-235	90.0		2.33E+000	22.450	1.446[42.257]	2.63	-0.508
	93.3		2.03E+000	50.690	1.263[62.057]		[0.644]
	109.2		2.21E+000	36.439	1.376[51.083]		
	143.8	^	1.61E+000	35.801	1.000[50.630]		
	163.4		1.84E+000	57.064	1.147[67.365]		
	205.3		1.50E+000	24.841	0.933[43.575]		