
***** 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-1032\UNC-GFLU-10

Report Generated On : 7/6/2017 9:57:02 AM

Sample Title : W3H-GFLU-1032-S-P-5
Sample Description :
Sample Identification : 1032-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 : 3.900E+002 grams

Sample Taken On : 5/30/2017 2:00:00 PM
Acquisition Started : 6/6/2017 10:45:13 AM

Live Time : 1800.0 seconds
Real Time : 1800.5 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

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

Detector Name: 8566

Sample Title: W3H-GFLU-1032-S-P-5

Peak Analysis Performed on: 7/6/2017 9:56:59 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	295-	315	299.71	75.11	0.63	1.21E+002	25.21	1.36E+002
m	2	295-	315	308.22	77.24	0.64	1.00E+002	22.48	1.33E+002
F	3	345-	353	348.67	87.36	0.45	5.55E+001	61.50	6.30E+001
F	4	367-	380	371.04	92.96	0.81	8.65E+001	18.28	6.77E+001
F	5	569-	579	574.24	143.81	0.81	5.64E+001	17.53	6.19E+001
F	6	736-	750	742.11	185.82	0.91	2.32E+002	30.25	9.19E+001
F	7	943-	958	952.97	238.59	1.05	1.49E+002	69.68	7.40E+001
F	8	1173-	1183	1177.99	294.90	0.73	3.20E+001	15.28	4.29E+001
F	9	1400-	1412	1405.76	351.89	1.16	6.85E+001	19.54	4.29E+001
F	10	5824-	5849	5835.88	1460.51	2.59	2.01E+002	28.63	8.67E+000

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

 ***** 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: W3H-GFLU-1032-S-P-5
 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	0.984	1460.82*	10.66	8.50961E+000	1.36209E+000
Pb-212	0.997	74.82*	10.28	6.79718E-001	1.68367E-001
		77.11*	17.10	3.30886E-001	8.62838E-002
		86.83	2.07		
		87.35*	3.97	7.36897E-001	8.21249E-001
		89.78	1.46		
		115.18	0.60		
		238.63*	43.60	2.68641E-001	1.28800E-001
		300.09	3.30		
PB-214	0.848	74.82*	5.80	1.20474E+000	3.17289E-001
		77.11*	9.70	5.83315E-001	1.60919E-001
		86.83	1.70		
		87.35*	2.24	1.30602E+000	1.45978E+000
		89.78	0.82		
		241.99	7.25		
		258.76	0.53		
		295.22*	18.42	1.68397E-001	8.18532E-002
		351.93*	35.60	2.24173E-001	6.66740E-002
		785.96	1.06		
		839.07	0.58		
Ra-226	0.979	81.07	0.20		
		83.79	0.32		
		186.21*	3.64	4.06802E+000	6.82728E-001
U-235	0.774	89.96	3.43		
		93.35*	5.54	8.05097E-001	1.97540E-001
		104.82	0.69		
		105.60	1.31		
		108.58	0.50		
		109.19	1.66		
		143.76*	10.96	2.79506E-001	9.17774E-002
		163.36	5.08		
		194.94	0.63		
		202.12	1.08		
		205.32	5.02		

* = 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	0.984	8.509610E+000	1.362092E+000
Pb-212	0.997	2.855777E-001	6.837907E-002
PB-214	0.848	2.033909E-001	5.072104E-002
Ra-226	0.979	4.068015E+000	6.827281E-001
U-235	0.774	3.728159E-001	8.323290E-002

? = 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 9:56:59 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: W3H-GFLU-1032-S-P-5
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	7.559E-001	7.56E-001	8.510E+000	3.207E-00
	Pb-210	46.54	4.25	1.469E+000	1.47E+000	1.323E+000	6.979E-00
	BI-212	727.33	6.67	1.430E+000	1.43E+000	1.831E-001	6.654E-00
		785.37	1.10	9.646E+000		5.307E+000	4.501E+00
		1078.62	0.56	2.050E+001		-4.242E+000	9.413E+00
		1620.50	1.47	7.916E+000		1.953E+000	3.503E+00
+	Pb-212	74.82*	10.28	3.193E-001	9.35E-002	6.797E-001	1.520E-00
		77.11*	17.10	1.859E-001		3.309E-001	8.849E-00
		86.83	2.07	1.916E+000		-1.016E+000	9.233E-00
		87.35*	3.97	5.837E-001		7.369E-001	2.739E-00
		89.78	1.46	2.313E+000		2.499E-001	1.108E+00
		115.18	0.60	4.751E+000		2.982E-001	2.260E+00
		238.63*	43.60	9.347E-002		2.686E-001	4.429E-00
		300.09	3.30	1.528E+000		-1.113E+000	7.234E-00
	BI-214	76.86	0.55	1.065E+001	2.14E-001	3.003E+001	5.185E+00
		79.29	0.91	4.865E+000		-1.019E+000	2.350E+00
		609.32	45.49	2.142E-001		9.388E-002	1.010E-00
		665.45	1.53	6.101E+000		-1.057E+000	2.852E+00
		768.36	4.89	2.217E+000		9.121E-001	1.037E+00
		806.18	1.26	7.065E+000		-9.450E+000	3.245E+00
		934.06	3.11	3.175E+000		-4.631E-001	1.454E+00
		1120.29	14.92	9.117E-001		1.792E-001	4.233E-00
		1155.21	1.63	7.974E+000		1.596E+000	3.681E+00
		1238.11	5.83	2.456E+000		-1.427E-001	1.137E+00
		1280.98	1.43	7.927E+000		-4.358E+000	3.583E+00
		1377.67	3.99	3.034E+000		1.626E+000	1.371E+00
		1385.31	0.79	1.334E+001		-4.230E+000	5.934E+00
		1401.52	1.33	7.169E+000		6.914E-001	3.142E+00
		1407.99	2.39	4.571E+000		-1.238E+000	2.038E+00
		1509.21	2.13	3.956E+000		-9.452E-001	1.683E+00
		1583.20	0.70	1.720E+001		-3.170E+000	7.670E+00
		1661.27	1.05	6.338E+000		-2.876E+000	2.515E+00
		1729.59	2.88	3.890E+000		9.216E-001	1.698E+00
		1764.49	15.30	9.556E-001		4.686E-001	4.305E-00
		1847.43	2.03	3.892E+000		-1.532E+000	1.573E+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	5.659E-001	1.16E-001	1.205E+000	2.695E-00
		77.11*	9.70	3.277E-001		5.833E-001	1.560E-00
		86.83	1.70	2.333E+000		-1.237E+000	1.124E+00
		87.35*	2.24	1.035E+000		1.306E+000	4.855E-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	4.117E+000	1.16E-001	4.449E-001	1.973E+00
		241.99	7.25	8.886E-001		-3.909E-001	4.294E-00
		258.76	0.53	8.840E+000		2.469E+000	4.203E+00
		295.22*	18.42	1.787E-001		1.684E-001	8.222E-00
		351.93*	35.60	1.158E-001		2.242E-001	5.348E-00
		785.96	1.06	1.004E+001		2.814E+000	4.683E+00
		839.07	0.58	1.882E+001		-1.042E+001	8.761E+00
+	Ra-226	81.07	0.20	1.702E+001	9.83E-001	-2.000E+001	8.134E+00
		83.79	0.32	1.228E+001		1.363E+001	5.917E+00
		186.21*	3.64	9.830E-001		4.068E+000	4.678E-00
	AC-228	89.96	1.90	2.229E+008	6.22E+007	2.289E+007	1.070E+00
		93.35	3.10	1.436E+008		1.060E+008	6.912E+00
		99.51	1.26	2.701E+008		1.202E+007	1.285E+00
		105.60	0.74	4.864E+008		-2.146E+008	2.322E+00
		129.07	2.42	1.547E+008		9.018E+007	7.388E+00
		153.98	0.72	5.107E+008		-2.522E+008	2.428E+00
		209.25	3.89	1.149E+008		-7.923E+007	5.452E+00
		214.85	0.76	5.819E+008		1.476E+008	2.757E+00
		270.24	3.46	1.637E+008		1.271E+008	7.772E+00
		328.00	2.95	2.114E+008		-8.753E+006	9.976E+00
		338.32	11.27	6.224E+007		2.012E+007	2.952E+00
		409.46	1.92	3.873E+008		-2.055E+008	1.821E+00
		463.00	4.40	1.975E+008		1.490E+008	9.305E+00
		562.50	0.87	1.055E+009		2.540E+008	4.923E+00
		674.75	2.10	5.377E+008		3.690E+007	2.514E+00
		726.86	0.62	1.762E+009		-4.931E+008	8.176E+00
		755.32	1.00	1.205E+009		-1.037E+009	5.618E+00
		772.29	1.49	7.889E+008		-3.073E+008	3.665E+00
		794.95	4.25	2.908E+008		-6.916E+006	1.353E+00
		830.49	0.54	2.346E+009		-1.735E+009	1.090E+00
		835.71	1.61	8.218E+008		-2.573E+008	3.830E+00
		840.38	0.91	1.493E+009		7.189E+008	6.969E+00
		904.20	0.77	2.011E+009		-1.162E+009	9.431E+00
		911.20	25.80	6.571E+007		4.046E+007	3.098E+00
		964.77	4.99	3.366E+008		3.695E+008	1.581E+00
		968.97	15.80	1.010E+008		5.295E+007	4.725E+00
		1247.08	0.50	3.055E+009		-9.577E+008	1.400E+00
		1459.14	0.83	4.739E+009		1.364E+010	2.282E+00
		1495.91	0.86	1.246E+009		5.932E+008	5.363E+00
		1588.20	3.22	4.998E+008		3.801E+008	2.255E+00
		1630.63	1.51	1.002E+009		-1.730E+008	4.480E+00
	TH-230	67.67	0.38	1.018E+001	1.02E+001	-7.506E-001	4.862E+00
	PA-234	742.81	0.11	9.333E+001	1.27E+001	1.336E+001	4.350E+00
		766.42	0.32	3.480E+001		1.648E+001	1.631E+00
		1001.03	0.84	1.273E+001		-8.572E+000	5.841E+00
	TH-234	63.29	3.70	1.195E+000	1.20E+000	3.453E-001	5.725E-00
		92.38	2.13	1.856E+000		3.151E-001	8.953E-00
		92.80	2.10	1.825E+000		-2.865E-001	8.794E-00
		112.81	0.21	1.335E+001		-1.351E+001	6.350E+00
	U-234	53.20	0.12	4.226E+001	4.23E+001	3.850E+001	2.015E+00
		120.90	0.04	7.821E+001		-2.780E+001	3.713E+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	1.035E+000	2.11E-001	1.063E-001	4.971E-00
		93.35*	5.54	4.849E-001		8.051E-001	2.298E-00
		104.82	0.69	4.544E+000		3.605E+000	2.172E+00
		105.60	1.31	2.303E+000		-1.016E+000	1.099E+00
		108.58	0.50	6.149E+000		-1.180E-001	2.938E+00
		109.19	1.66	1.801E+000		-1.127E+000	8.591E-00
		143.76*	10.96	2.112E-001		2.795E-001	9.888E-00
		163.36	5.08	7.062E-001		6.166E-001	3.376E-00
		194.94	0.63	5.587E+000		-4.354E+000	2.652E+00
		202.12	1.08	3.762E+000		7.720E-001	1.796E+00
		205.32	5.02	8.094E-001		2.627E-001	3.861E-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-1032\UNC-GFLU-10

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 ^	8.51E+000	16.007			
Pb-212	74.8	6.80E-001	24.770	2.530[53.966]	2.94	-0.537
	77.1	3.31E-001	26.077	1.232[54.578]		[0.678]
	87.3	7.37E-001	111.44	2.743[121.32]		
	238.6 ^	2.69E-001	47.945	1.000[67.805]		
PB-214	74.8	1.20E+000	26.337	5.374[39.727]	5.59	-0.979
	77.1	5.83E-001	27.587	2.602[40.566]		[0.297]
	87.3	1.31E+000	111.77	5.826[115.66]		
	295.2	1.68E-001	48.607	0.751[56.985]		
	351.9 ^	2.24E-001	29.742	1.000[42.062]		
Ra-226	186.2 ^	4.07E+000	16.783			
U-235	93.3	8.05E-001	24.536	2.880[40.990]	12.17	-2.450
	143.8 ^	2.80E-001	32.836	1.000[46.436]		[1.434]