
***** 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 9:57:31 AM

Sample Title : W3H-GFLU-1032-S-P-6
Sample Description :
Sample Identification : 1032-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 : 1.000 keV

Sample Size : 1.463E+002 grams

Sample Taken On : 5/30/2017 2:00:00 PM
Acquisition Started : 6/6/2017 11:29:56 AM

Live Time : 1800.0 seconds
Real Time : 1800.4 seconds

Dead Time : 0.02 %

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-6

Peak Analysis Performed on: 7/6/2017 9:57:27 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	286-	305	290.95	72.92	0.75	6.53E+001	16.59	5.60E+001
m	2	286-	305	299.54	75.07	0.76	1.08E+002	20.64	8.30E+001
F	3	569-	579	574.25	143.81	0.61	6.78E+001	50.24	3.85E+001
F	4	736-	749	741.57	185.69	0.93	2.67E+002	30.72	4.03E+001
F	5	5825-	5845	5835.46	1460.40	2.10	1.16E+002	22.21	1.05E+001

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-6
 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	0.972	1460.82*	10.66	1.30966E+001	2.68310E+000
Ra-226	0.962	81.07	0.20		
		83.79	0.32		
		186.21*	3.64	1.24526E+001	1.94767E+000
U-235	1.000	89.96	3.43		
		93.35	5.54		
		104.82	0.69		
		105.60	1.31		
		108.58	0.50		
		109.19	1.66		
		143.76*	10.96	8.96753E-001	6.70789E-001
		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	0.972	1.309656E+001	2.683101E+000
Ra-226	0.962	1.245264E+001	1.947668E+000
U-235	1.000	8.967533E-001	6.707886E-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 9:57:27 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 1	72.92	3.6285E-002	25.40		
m 2	75.07	5.9938E-002	19.13	Tol.	PB-214

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: W3H-GFLU-1032-S-P-6
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	2.077E+000	2.08E+000	1.310E+001	8.857E-00
	Pb-210	46.54	4.25	3.297E+000	3.30E+000	2.835E+000	1.550E+00
	BI-212	727.33	6.67	3.663E+000	3.66E+000	2.050E+000	1.700E+00
		785.37	1.10	2.175E+001		6.076E+000	1.002E+00
		1078.62	0.56	4.775E+001		-5.963E+000	2.165E+00
		1620.50	1.47	1.805E+001		-3.365E+000	7.812E+00
	Pb-212	74.82	10.28	1.199E+000	2.47E-001	-6.995E-002	5.793E-00
		77.11	17.10	6.150E-001		1.865E-001	2.956E-00
		86.83	2.07	4.047E+000		4.421E-001	1.931E+00
		87.35	3.97	1.899E+000		-4.380E+000	9.014E-00
		89.78	1.46	4.773E+000		-4.869E+000	2.258E+00
		115.18	0.60	1.075E+001		5.224E+000	5.068E+00
		238.63	43.60	2.471E-001		2.078E-001	1.170E-00
		300.09	3.30	3.408E+000		-1.635E+000	1.596E+00
	BI-214	76.86	0.55	2.004E+001	4.71E-001	8.588E+000	9.645E+00
		79.29	0.91	7.947E+000		2.553E+000	3.753E+00
		609.32	45.49	4.709E-001		1.206E-002	2.191E-00
		665.45	1.53	1.416E+001		3.265E+000	6.553E+00
		768.36	4.89	4.847E+000		-2.091E+000	2.234E+00
		806.18	1.26	2.019E+001		-8.829E+000	9.327E+00
		934.06	3.11	7.424E+000		-2.058E+000	3.356E+00
		1120.29	14.92	2.157E+000		-3.573E-001	9.913E-00
		1155.21	1.63	2.023E+001		8.135E+000	9.299E+00
		1238.11	5.83	6.603E+000		1.913E+000	3.059E+00
		1280.98	1.43	2.381E+001		-4.872E+000	1.089E+00
		1377.67	3.99	5.946E+000		-1.036E+000	2.585E+00
		1385.31	0.79	3.254E+001		-8.859E-001	1.431E+00
		1401.52	1.33	2.142E+001		1.271E+001	9.527E+00
		1407.99	2.39	1.242E+001		6.250E+000	5.550E+00
		1509.21	2.13	1.273E+001		5.427E+000	5.577E+00
		1583.20	0.70	4.759E+001		9.673E+000	2.132E+00
		1661.27	1.05	2.592E+001		1.334E+001	1.122E+00
		1729.59	2.88	8.823E+000		1.800E+000	3.753E+00
		1764.49	15.30	2.588E+000		2.363E+000	1.168E+00
		1847.43	2.03	1.385E+001		-8.166E+000	5.929E+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	2.125E+000	3.75E-001	-1.240E-001	1.027E+00
		77.11	9.70	1.084E+000		3.287E-001	5.210E-00
		86.83	1.70	4.927E+000		5.383E-001	2.352E+00
		87.35	2.24	3.365E+000		-7.763E+000	1.598E+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	8.498E+000	3.75E-001	-8.669E+000	4.020E+00
		241.99	7.25	1.499E+000		8.953E-001	7.097E-00
		258.76	0.53	1.590E+001		-8.291E+000	7.373E+00
		295.22	18.42	6.005E-001		-2.586E-001	2.812E-00
		351.93	35.60	3.752E-001		7.417E-002	1.758E-00
		785.96	1.06	2.285E+001		4.576E+000	1.053E+00
		839.07	0.58	4.540E+001		1.730E+001	2.097E+00
+	Ra-226	81.07	0.20	3.158E+001	1.74E+000	-3.285E+001	1.479E+00
		83.79	0.32	2.663E+001		2.386E+001	1.271E+00
		186.21*	3.64	1.740E+000		1.245E+001	8.069E-00
	AC-228	89.96	1.90	5.188E+008	1.35E+008	-7.062E+008	2.466E+00
		93.35	3.10	3.428E+008		5.743E+007	1.636E+00
		99.51	1.26	6.070E+008		1.464E+008	2.846E+00
		105.60	0.74	1.003E+009		-6.300E+008	4.696E+00
		129.07	2.42	3.318E+008		4.652E+007	1.558E+00
		153.98	0.72	1.188E+009		-4.818E+008	5.574E+00
		209.25	3.89	2.933E+008		-4.493E+008	1.382E+00
		214.85	0.76	1.312E+009		-3.628E+008	6.117E+00
		270.24	3.46	3.794E+008		2.442E+008	1.777E+00
		328.00	2.95	5.456E+008		-1.586E+008	2.556E+00
		338.32	11.27	1.457E+008		7.033E+007	6.819E+00
		409.46	1.92	1.045E+009		5.491E+008	4.894E+00
		463.00	4.40	4.700E+008		-3.056E+007	2.184E+00
		562.50	0.87	3.059E+009		1.699E+008	1.427E+00
		674.75	2.10	1.370E+009		9.896E+007	6.342E+00
		726.86	0.62	5.067E+009		8.170E+008	2.349E+00
		755.32	1.00	3.391E+009		-8.065E+008	1.577E+00
		772.29	1.49	2.075E+009		-2.142E+007	9.564E+00
		794.95	4.25	7.830E+008		-2.144E+008	3.623E+00
		830.49	0.54	6.801E+009		3.993E+009	3.161E+00
		835.71	1.61	2.202E+009		6.138E+008	1.020E+00
		840.38	0.91	3.636E+009		1.016E+009	1.674E+00
		904.20	0.77	4.725E+009		-2.382E+009	2.181E+00
		911.20	25.80	1.351E+008		-1.265E+007	6.211E+00
		964.77	4.99	8.415E+008		5.116E+008	3.911E+00
		968.97	15.80	2.730E+008		1.583E+008	1.271E+00
		1247.08	0.50	8.858E+009		-4.923E+009	4.060E+00
		1459.14	0.83	1.093E+010		2.599E+010	5.210E+00
		1495.91	0.86	3.842E+009		2.060E+007	1.670E+00
		1588.20	3.22	1.280E+009		3.248E+008	5.696E+00
		1630.63	1.51	2.495E+009		3.191E+008	1.093E+00
	TH-230	67.67	0.38	1.947E+001	1.95E+001	3.705E+000	9.136E+00
	PA-234	742.81	0.11	2.414E+002	3.57E+001	1.469E+002	1.123E+00
		766.42	0.32	7.611E+001		-5.933E+001	3.513E+00
		1001.03	0.84	3.574E+001		8.069E+000	1.647E+00
	TH-234	63.29	3.70	2.310E+000	2.31E+000	1.939E+000	1.088E+00
		92.38	2.13	4.130E+000		3.942E+000	1.977E+00
		92.80	2.10	4.113E+000		4.059E+000	1.968E+00
		112.81	0.21	3.029E+001		1.168E+001	1.427E+00
	U-234	53.20	0.12	8.065E+001	8.06E+001	2.213E+001	3.772E+00
		120.90	0.04	1.613E+002		-6.727E+001	7.536E+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	2.215E+000	4.52E-001	-3.016E+000	1.053E+00
		93.35	5.54	1.479E+000		2.477E-001	7.058E-00
		104.82	0.69	8.247E+000		-3.608E-001	3.857E+00
		105.60	1.31	4.368E+000		-2.743E+000	2.045E+00
		108.58	0.50	1.215E+001		5.839E+000	5.712E+00
		109.19	1.66	3.577E+000		8.119E-001	1.679E+00
		143.76*	10.96	4.516E-001		8.968E-001	2.079E-00
		163.36	5.08	1.447E+000		7.110E-001	6.824E-00
		194.94	0.63	1.331E+001		1.182E+001	6.275E+00
		202.12	1.08	8.272E+000		4.011E+000	3.908E+00
		205.32	5.02	1.870E+000		9.017E-001	8.853E-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
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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]
-----	-----		-----	-----	-----	-----	-----
K-40	1460.8	^	1.31E+001	20.487			
Ra-226	186.2	^	1.25E+001	15.641			
U-235	143.8	^	8.97E-001	74.802			