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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-2123\UNC-GFLU-21

Report Generated On : 7/6/2017 10:13:48 AM

Sample Title : UNC-GFLU-2123-S-P-7
Sample Description :
Sample Identification : 2123-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 : 3.410E+002 grams

Sample Taken On : 6/1/2017 2:00:00 PM
Acquisition Started : 6/5/2017 1:38:43 PM

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

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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: UNC-GFLU-2123-S-P-7
Peak Analysis Performed on: 7/6/2017 10:13:44 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-	316	299.60	75.08	0.71	1.10E+002	22.98	1.01E+002
m	2	295-	316	308.56	77.33	0.72	4.81E+001	17.25	1.20E+002
F	3	356-	364	359.85	90.16	0.70	4.57E+001	15.86	5.40E+001
F	4	570-	580	574.10	143.77	0.76	5.09E+001	88.47	5.78E+001
F	5	734-	749	741.73	185.73	1.01	3.15E+002	81.38	6.60E+001
F	6	948-	957	952.83	238.55	0.86	7.95E+001	19.81	3.50E+001
F	7	1174-	1183	1179.02	295.15	0.45	1.75E+001	36.61	2.80E+001
F	8	1400-	1413	1404.74	351.64	0.52	3.73E+001	14.42	3.92E+001
F	9	2427-	2440	2433.36	609.05	1.24	2.84E+001	13.91	2.33E+001
F	10	5824-	5849	5835.52	1460.42	2.98	1.59E+002	25.12	2.89E+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: UNC-GFLU-2123-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	0.974	1460.82*	10.66	7.68659E+000	1.33980E+000
Pb-212	0.996	74.82*	10.28	7.05703E-001	1.75349E-001
		77.11*	17.10	1.81251E-001	6.93898E-002
		86.83	2.07		
		87.35	3.97		
		89.78*	1.46	1.86307E+000	6.86193E-001
		115.18	0.60		
		238.63*	43.60	1.64366E-001	4.41613E-002
		300.09	3.30		
BI-214	0.365	76.86*	0.55	5.68695E+000	2.18318E+000
		79.29	0.91		
		609.32*	45.49	1.47075E-001	7.27826E-002
		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		
		1847.43	2.03		
		2118.51	1.16		
		2204.06	4.92		
		2447.70	1.55		
PB-214	0.845	74.82*	5.80	1.25080E+000	3.30328E-001
		77.11*	9.70	3.19524E-001	1.25663E-001
		86.83	1.70		
		87.35	2.24		
		89.78*	0.82	3.31718E+000	1.25516E+000
		241.99	7.25		
		258.76	0.53		
		295.22*	18.42	1.05703E-001	2.20847E-001
		351.93*	35.60	1.39523E-001	5.51896E-002

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/gram)	Activity Uncertainty
PB-214	0.845	785.96	1.06		
		839.07	0.58		
Ra-226	0.968	81.07	0.20		
		83.79	0.32		
		186.21*	3.64	6.29288E+000	1.75938E+000
U-235	0.520	89.96*	3.43	7.93025E-001	2.93180E-001
		93.35	5.54		
		104.82	0.69		
		105.60	1.31		
		108.58	0.50		
		109.19	1.66		
		143.76*	10.96	2.88768E-001	5.02592E-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

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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	0.974	7.686592E+000	1.339799E+000
Pb-212	0.996	1.670236E-001	3.736861E-002
BI-214	0.365	1.446002E-001	7.274897E-002
PB-214	0.845	1.396234E-001	4.986322E-002
Ra-226	0.968	6.292881E+000	1.759381E+000
U-235	0.520	5.885086E-001	2.517302E-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 10:13:44 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

All peaks were identified.

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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: UNC-GFLU-2123-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	5.545E-001	5.54E-001	7.687E+000	2.117E-00
	Pb-210	46.54	4.25	1.726E+000	1.73E+000	1.263E+000	8.207E-00
	BI-212	727.33	6.67	1.790E+000	1.79E+000	-1.257E-001	8.382E-00
		785.37	1.10	9.608E+000		5.408E+000	4.435E+00
		1078.62	0.56	2.319E+001		-1.813E+001	1.064E+00
		1620.50	1.47	7.980E+000		-5.160E+000	3.469E+00
+	Pb-212	74.82*	10.28	3.169E-001	6.59E-002	7.057E-001	1.498E-00
		77.11*	17.10	2.025E-001		1.813E-001	9.616E-00
		86.83	2.07	2.097E+000		2.577E-001	1.009E+00
		87.35	3.97	9.988E-001		-1.260E+000	4.789E-00
		89.78*	1.46	1.669E+000		1.863E+000	7.792E-00
		115.18	0.60	5.210E+000		1.137E+000	2.473E+00
		238.63*	43.60	6.592E-002		1.644E-001	3.017E-00
		300.09	3.30	1.724E+000		-6.570E-001	8.157E-00
+	BI-214	76.86*	0.55	6.354E+000	1.35E-001	5.687E+000	3.017E+00
		79.29	0.91	4.602E+000		8.390E-001	2.206E+00
		609.32*	45.49	1.350E-001		1.471E-001	6.050E-00
		665.45	1.53	6.594E+000		2.634E-001	3.070E+00
		768.36	4.89	2.434E+000		2.653E+000	1.136E+00
		806.18	1.26	8.251E+000		-1.460E+000	3.796E+00
		934.06	3.11	4.479E+000		2.458E+000	2.086E+00
		1120.29	14.92	9.904E-001		3.549E-001	4.579E-00
		1155.21	1.63	9.620E+000		1.406E+000	4.460E+00
		1238.11	5.83	2.881E+000		1.579E+000	1.337E+00
		1280.98	1.43	1.080E+001		-7.236E+000	4.963E+00
		1377.67	3.99	3.623E+000		1.313E+000	1.645E+00
		1385.31	0.79	1.615E+001		-9.917E+000	7.235E+00
		1401.52	1.33	1.007E+001		-3.829E+000	4.528E+00
		1407.99	2.39	6.234E+000		3.993E+000	2.834E+00
		1509.21	2.13	5.461E+000		1.372E+000	2.393E+00
		1583.20	0.70	1.765E+001		-1.354E+000	7.761E+00
		1661.27	1.05	9.631E+000		-5.252E-001	4.067E+00
		1729.59	2.88	4.449E+000		3.339E+000	1.942E+00
		1764.49	15.30	1.075E+000		4.959E-001	4.835E-00
		1847.43	2.03	8.048E+000		1.499E+000	3.597E+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	5.618E-001	1.29E-001	1.251E+000	2.655E-00
		77.11*	9.70	3.570E-001		3.195E-001	1.695E-00
		86.83	1.70	2.554E+000		3.138E-001	1.229E+00
		87.35	2.24	1.770E+000		-2.232E+000	8.487E-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	2.971E+000	1.29E-001	3.317E+000	1.387E+00
		241.99	7.25	8.439E-001		-7.934E-001	4.049E-00
		258.76	0.53	8.590E+000		5.867E-001	4.047E+00
		295.22*	18.42	1.647E-001		1.057E-001	7.420E-00
		351.93*	35.60	1.295E-001		1.395E-001	5.968E-00
		785.96	1.06	9.901E+000		4.311E+000	4.567E+00
		839.07	0.58	2.323E+001		2.000E+001	1.087E+00
+	Ra-226	81.07	0.20	1.733E+001	9.80E-001	-2.340E+000	8.234E+00
		83.79	0.32	1.364E+001		1.835E+001	6.562E+00
		186.21*	3.64	9.803E-001		6.293E+000	4.631E-00
	AC-228	89.96	1.90	1.081E+005	2.68E+004	-1.278E+005	5.197E+00
		93.35	3.10	6.476E+004		6.194E+004	3.111E+00
		99.51	1.26	1.153E+005		7.406E+004	5.458E+00
		105.60	0.74	2.064E+005		-1.416E+004	9.797E+00
		129.07	2.42	6.346E+004		8.059E+003	3.008E+00
		153.98	0.72	2.229E+005		-4.240E+004	1.055E+00
		209.25	3.89	5.399E+004		-2.850E+004	2.562E+00
		214.85	0.76	2.792E+005		3.178E+005	1.324E+00
		270.24	3.46	6.393E+004		-2.481E+004	3.000E+00
		328.00	2.95	1.049E+005		1.255E+005	4.967E+00
		338.32	11.27	2.760E+004		1.289E+004	1.304E+00
		409.46	1.92	1.752E+005		5.875E+004	8.214E+00
		463.00	4.40	8.750E+004		1.931E+004	4.104E+00
		562.50	0.87	4.819E+005		-2.191E+005	2.242E+00
		674.75	2.10	2.296E+005		9.616E+004	1.065E+00
		726.86	0.62	9.508E+005		-6.675E+004	4.453E+00
		755.32	1.00	5.627E+005		1.022E+003	2.620E+00
		772.29	1.49	3.677E+005		8.470E+004	1.706E+00
		794.95	4.25	1.346E+005		5.041E+004	6.252E+00
		830.49	0.54	1.146E+006		-3.903E+005	5.338E+00
		835.71	1.61	4.033E+005		1.045E+005	1.884E+00
		840.38	0.91	7.171E+005		5.016E+005	3.351E+00
		904.20	0.77	8.990E+005		-2.314E+005	4.199E+00
		911.20	25.80	2.683E+004		7.893E+003	1.253E+00
		964.77	4.99	1.375E+005		9.636E+004	6.392E+00
		968.97	15.80	4.461E+004		1.630E+003	2.077E+00
		1247.08	0.50	1.495E+006		-1.197E+006	6.873E+00
		1459.14	0.83	1.979E+006		4.491E+006	9.479E+00
		1495.91	0.86	6.458E+005		3.366E+004	2.819E+00
		1588.20	3.22	2.006E+005		1.033E+005	8.875E+00
		1630.63	1.51	3.971E+005		9.965E+004	1.733E+00
	TH-230	67.67	0.38	9.698E+000	9.70E+000	-6.168E+000	4.591E+00
	PA-234	742.81	0.11	1.028E+002	1.70E+001	-7.829E+000	4.777E+00
		766.42	0.32	3.669E+001		1.785E+001	1.709E+00
		1001.03	0.84	1.703E+001		1.036E+001	7.918E+00
	TH-234	63.29	3.70	1.230E+000	1.23E+000	5.923E-001	5.865E-00
		92.38	2.13	2.115E+000		1.876E+000	1.020E+00
		92.80	2.10	2.075E+000		2.247E+000	9.994E-00
		112.81	0.21	1.487E+001		-6.806E+000	7.061E+00
	U-234	53.20	0.12	4.065E+001	4.06E+001	7.705E+000	1.921E+00
		120.90	0.04	9.363E+001		2.677E+001	4.455E+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	7.103E-001	2.34E-001	7.930E-001	3.317E-00
		93.35	5.54	7.333E-001		7.015E-001	3.523E-00
		104.82	0.69	4.404E+000		-8.161E-001	2.088E+00
		105.60	1.31	2.359E+000		-1.618E-001	1.120E+00
		108.58	0.50	6.352E+000		-3.160E+000	3.019E+00
		109.19	1.66	1.928E+000		5.225E-002	9.168E-00
		143.76*	10.96	2.338E-001		2.888E-001	1.092E-00
		163.36	5.08	7.042E-001		-1.476E-001	3.343E-00
		194.94	0.63	6.207E+000		-1.470E+000	2.941E+00
		202.12	1.08	3.960E+000		-8.469E-001	1.882E+00
		205.32	5.02	9.012E-001		5.165E-001	4.294E-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

Filename: C:\GENIE2K\CAMFILES\UNC 2017\IMC Samples\IMC-2123\UNC-GFLU-21

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	^	7.69E+000	17.430			
Pb-212	74.8		7.06E-001	24.847	4.293[36.596]	6.11	-1.095
	77.1		1.81E-001	38.284	1.103[46.771]		[0.407]
	89.8		1.86E+000	36.831	11.335[45.590]		
	238.6	^	1.64E-001	26.868	1.000[37.997]		
BI-214	76.9		5.69E+000	38.389	38.667[62.631]	11.32	-1.765
	609.3	^	1.47E-001	49.487	1.000[69.985]		[0.454]
PB-214	74.8		1.25E+000	26.409	8.965[47.562]	7.82	-1.318
	77.1		3.20E-001	39.328	2.290[55.780]		[0.418]
	89.8		3.32E+000	37.838	23.775[54.739]		
	295.2		1.06E-001	208.93	0.758[212.64]		
	351.9	^	1.40E-001	39.556	1.000[55.940]		
Ra-226	186.2	^	6.29E+000	27.958			
U-235	90.0		7.93E-001	36.970	2.746[177.93]	10.71	-2.155
	143.8	^	2.89E-001	174.04	1.000[246.14]		[6.478]