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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-0226\UNC-IMC-022

Report Generated On : 5/9/2017 10:28:33 AM

Sample Title : UNC-IMC-0226-S-P-2
Sample Description :
Sample Identification : IMC-0226-S-P-2
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 : 2.552E+002 grams

Sample Taken On : 4/18/2017 12:00:00 AM
Acquisition Started : 5/1/2017 9:25:28 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 : 5/9/2017
Efficiency ID : H-IMC-0226-S-P-2

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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-IMC-0226-S-P-2
Peak Analysis Performed on: 5/9/2017 10:28:26 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	295-	303	299.73	75.12	0.54	9.05E+001	22.71	9.30E+001
F	2	365-	380	373.52	93.58	0.23	5.24E+001	3.32	8.80E+001
F	3	734-	748	741.80	185.74	0.94	1.20E+002	22.21	6.19E+001
F	4	946-	959	952.64	238.50	0.97	8.11E+001	19.97	5.60E+001
F	5	1176-	1184	1179.80	295.35	0.48	2.72E+001	447.09	3.42E+001
F	6	1398-	1411	1404.66	351.62	1.22	4.18E+001	14.32	1.96E+001
F	7	2320-	2332	2327.44	582.54	1.04	2.16E+001	12.30	1.95E+001
F	8	5822-	5848	5835.79	1460.49	2.92	1.85E+002	27.45	7.50E+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-IMC-0226-S-P-2
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	0.982	1460.82*	10.66	1.34597E+001	2.30625E+000
Pb-212	0.629	74.82*	10.28	8.31813E-001	2.67878E-001
		77.11	17.10		
		86.83	2.07		
		87.35	3.97		
		89.78	1.46		
		115.18	0.60		
		238.63*	43.60	2.48562E-001	7.27402E-002
		300.09	3.30		
PB-214	0.609	74.82*	5.80	1.47432E+000	4.92775E-001
		77.11	9.70		
		86.83	1.70		
		87.35	2.24		
		89.78	0.82		
		241.99	7.25		
		258.76	0.53		
		295.22*	18.42	2.43392E-001	4.00749E+000
		351.93*	35.60	2.32832E-001	8.67598E-002
		785.96	1.06		
		839.07	0.58		
Ra-226	0.970	81.07	0.20		
		83.79	0.32		
		186.21*	3.64	3.55544E+000	8.91152E-001
TH-234	0.299	63.29	3.70		
		92.38	2.13		
		92.80*	2.10	2.12994E+000	5.92082E-001
		112.81	0.21		
U-235	0.504	89.96	3.43		
		93.35*	5.54	8.07376E-001	1.71046E-001
		104.82	0.69		
		105.60	1.31		
		108.58	0.50		
		109.19	1.66		
		143.76	10.96		
		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	0.982	1.345967E+001	2.306249E+000
	Pb-212	0.629	2.790972E-001	7.003208E-002
	PB-214	0.609	2.574773E-001	8.539021E-002
	Ra-226	0.970	3.555436E+000	8.911516E-001
?	TH-234	0.299	2.129935E+000	5.920822E-001
?	U-235	0.504	8.073761E-001	1.710465E-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: 5/9/2017 10:28:26 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	7	582.54	1.1986E-002	56.99		

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 M D A R E P O R T *****
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Detector Name: 8566
Sample Geometry: cylinder
Sample Title: UNC-IMC-0226-S-P-2
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	1.236E+000	1.24E+000	1.346E+001	5.195E-00
	Pb-210	46.54	4.25	2.336E+000	2.34E+000	2.454E+000	1.110E+00
	BI-212	727.33	6.67	2.488E+000	2.49E+000	1.757E+000	1.159E+00
		785.37	1.10	1.427E+001		-7.176E+000	6.582E+00
		1078.62	0.56	2.990E+001		-2.108E+001	1.352E+00
		1620.50	1.47	1.092E+001		7.831E-001	4.675E+00
+	Pb-212	74.82*	10.28	4.862E-001	1.33E-001	8.318E-001	2.306E-00
		77.11	17.10	4.538E-001		3.168E-002	2.195E-00
		86.83	2.07	2.764E+000		1.534E+000	1.325E+00
		87.35	3.97	1.340E+000		-1.629E+000	6.401E-00
		89.78	1.46	3.554E+000		5.521E-001	1.697E+00
		115.18	0.60	6.538E+000		-1.949E+000	3.076E+00
		238.63*	43.60	1.334E-001		2.486E-001	6.254E-00
		300.09	3.30	2.539E+000		-2.039E+000	1.201E+00
	BI-214	76.86	0.55	1.438E+001	3.65E-001	2.561E+000	6.959E+00
		79.29	0.91	6.571E+000		4.193E+000	3.150E+00
		609.32	45.49	3.645E-001		2.980E-001	1.718E-00
		665.45	1.53	1.002E+001		3.424E+000	4.670E+00
		768.36	4.89	3.597E+000		3.140E+000	1.677E+00
		806.18	1.26	1.287E+001		-8.703E+000	5.941E+00
		934.06	3.11	5.389E+000		-6.214E+000	2.465E+00
		1120.29	14.92	1.618E+000		-3.160E-001	7.529E-00
		1155.21	1.63	1.397E+001		5.589E-001	6.459E+00
		1238.11	5.83	4.370E+000		6.714E-001	2.029E+00
		1280.98	1.43	1.364E+001		2.661E+000	6.166E+00
		1377.67	3.99	4.812E+000		1.184E+000	2.155E+00
		1385.31	0.79	2.250E+001		2.237E+000	9.982E+00
		1401.52	1.33	1.637E+001		1.595E+001	7.421E+00
		1407.99	2.39	7.396E+000		-1.905E+000	3.272E+00
		1509.21	2.13	7.787E+000		4.195E+000	3.385E+00
		1583.20	0.70	3.389E+001		-5.330E+000	1.534E+00
		1661.27	1.05	1.451E+001		-7.914E-001	6.128E+00
		1729.59	2.88	6.327E+000		2.107E+000	2.738E+00
		1764.49	15.30	1.822E+000		1.890E+000	8.296E-00
		1847.43	2.03	8.629E+000		1.570E+000	3.671E+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	8.617E-001	1.41E-001	1.474E+000	4.088E-00
		77.11	9.70	7.999E-001		5.584E-002	3.870E-00
		86.83	1.70	3.365E+000		1.867E+000	1.613E+00
		87.35	2.24	2.374E+000		-2.886E+000	1.134E+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	6.327E+000	1.41E-001	9.831E-001	3.021E+00
		241.99	7.25	1.210E+000		-4.669E-003	5.797E-00
		258.76	0.53	1.220E+001		3.755E+000	5.732E+00
		295.22*	18.42	2.620E-001		2.434E-001	1.189E-00
		351.93*	35.60	1.407E-001		2.328E-001	6.281E-00
		785.96	1.06	1.456E+001		-1.451E+001	6.704E+00
		839.07	0.58	3.229E+001		6.038E+000	1.503E+00
+	Ra-226	81.07	0.20	2.369E+001	1.38E+000	-2.223E+001	1.122E+00
		83.79	0.32	1.685E+001		8.878E+000	8.054E+00
		186.21*	3.64	1.378E+000		3.555E+000	6.489E-00
	AC-228	89.96	1.90	1.633E+016	4.71E+015	2.359E+015	7.821E+01
		93.35	3.10	9.828E+015		3.604E+015	4.706E+01
		99.51	1.26	1.776E+016		1.382E+016	8.377E+01
		105.60	0.74	2.859E+016		8.876E+015	1.344E+01
		129.07	2.42	9.013E+015		4.925E+015	4.234E+01
		153.98	0.72	3.731E+016		1.041E+016	1.767E+01
		209.25	3.89	8.586E+015		-2.927E+015	4.064E+01
		214.85	0.76	4.354E+016		3.321E+016	2.057E+01
		270.24	3.46	1.194E+016		3.201E+015	5.642E+01
		328.00	2.95	1.669E+016		-2.257E+015	7.873E+01
		338.32	11.27	4.710E+015		-4.226E+014	2.228E+01
		409.46	1.92	2.921E+016		3.916E+015	1.369E+01
		463.00	4.40	1.452E+016		-3.160E+015	6.806E+01
		562.50	0.87	7.985E+016		5.712E+015	3.711E+01
		674.75	2.10	3.997E+016		9.947E+015	1.859E+01
		726.86	0.62	1.499E+017		1.220E+017	6.985E+01
		755.32	1.00	7.575E+016		-1.105E+017	3.461E+01
		772.29	1.49	6.257E+016		9.924E+015	2.905E+01
		794.95	4.25	2.101E+016		7.489E+015	9.701E+01
		830.49	0.54	1.673E+017		1.116E+016	7.703E+01
		835.71	1.61	6.281E+016		1.153E+016	2.918E+01
		840.38	0.91	1.135E+017		-3.765E+016	5.277E+01
		904.20	0.77	1.581E+017		-1.691E+016	7.402E+01
		911.20	25.80	5.368E+015		4.121E+015	2.534E+01
		964.77	4.99	2.535E+016		1.062E+016	1.185E+01
		968.97	15.80	7.875E+015		4.158E+015	3.678E+01
		1247.08	0.50	2.686E+017		-1.575E+017	1.241E+01
		1459.14	0.83	3.684E+017		9.978E+017	1.772E+01
		1495.91	0.86	1.153E+017		1.598E+016	5.069E+01
		1588.20	3.22	4.373E+016		2.210E+016	1.991E+01
		1630.63	1.51	6.154E+016		1.864E+016	2.650E+01
	TH-230	67.67	0.38	1.324E+001	1.32E+001	-2.625E+000	6.255E+00
	PA-234	742.81	0.11	1.478E+002	2.19E+001	-2.575E+000	6.849E+00
		766.42	0.32	5.376E+001		2.765E+001	2.500E+00
		1001.03	0.84	2.187E+001		-1.710E+001	1.004E+00
+	TH-234	63.29	3.70	1.664E+000	1.66E+000	6.389E-001	7.914E-00
		92.38	2.13	2.802E+000		1.019E+000	1.346E+00
		92.80*	2.10	2.514E+000		2.130E+000	1.202E+00
		112.81	0.21	1.996E+001		5.178E+000	9.433E+00
	U-234	53.20	0.12	5.267E+001	5.27E+001	-1.512E+001	2.478E+00
		120.90	0.04	1.099E+002		-2.452E+001	5.165E+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	1.626E+000	4.55E-001	2.349E-001	7.789E-00
		93.35*	5.54	9.530E-001		8.074E-001	4.556E-00
		104.82	0.69	5.328E+000		-1.970E+000	2.497E+00
		105.60	1.31	2.904E+000		9.014E-001	1.365E+00
		108.58	0.50	8.392E+000		-9.006E-001	3.967E+00
		109.19	1.66	2.575E+000		3.222E-001	1.219E+00
		143.76	10.96	4.549E-001		1.773E-002	2.162E-00
		163.36	5.08	9.301E-001		3.871E-001	4.388E-00
		194.94	0.63	8.983E+000		-3.062E+000	4.251E+00
		202.12	1.08	6.119E+000		3.893E+000	2.915E+00
		205.32	5.02	1.238E+000		-9.650E-001	5.876E-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-0226\UNC-IMC-022

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	^	1.35E+001	17.135			
Pb-212	74.8		8.32E-001	32.204	3.346[43.514]	5.70	-1.041
	238.6	^	2.49E-001	29.264	1.000[41.386]		[0.518]
PB-214	74.8		1.47E+000	33.424	6.332[50.057]	6.99	-1.192
	295.2		2.43E-001	1646.5	1.045[1646.9]		[0.469]
	351.9	^	2.33E-001	37.263	1.000[52.697]		
Ra-226	186.2	^	3.56E+000	25.064			
TH-234	92.8		2.13E+000	******			
U-235	93.3		8.07E-001	******			