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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-1483\UNC-IMC-148

Report Generated On : 5/4/2017 8:36:29 AM

Sample Title : UNC-IMC-1483-S-P-6

Sample Description :

Sample Identification : IMC-1483-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 : 3.485E+002 grams

Sample Taken On : 4/10/2017 12:00:00 AM

Acquisition Started : 4/25/2017 10:16:50 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 : 5/4/2017

Efficiency ID : H-IMC-1483-S-P-6

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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-1483-S-P-6

Peak Analysis Performed on: 5/4/2017 8:36:25 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	181-	190	186.45	46.77	0.68	1.01E+002	549.25	6.33E+001
F	2	207-	220	213.09	53.44	0.86	1.02E+002	73.80	7.23E+001
M	3	283-	314	291.51	73.06	0.77	1.00E+002	16.42	1.59E+002
m	4	283-	314	300.17	75.23	0.78	2.14E+002	23.08	2.46E+002
m	5	283-	314	308.53	77.32	0.79	6.32E+001	15.13	3.18E+002
F	6	330-	343	337.07	84.46	0.80	2.03E+002	28.14	1.35E+002
F	7	354-	366	359.65	90.11	0.91	9.43E+001	77.81	1.13E+002
F	8	366-	378	373.34	93.54	0.86	1.31E+002	23.95	1.19E+002
F	9	566-	580	574.51	143.88	0.84	2.42E+002	90.42	1.05E+002
F	10	647-	658	652.40	163.37	0.85	8.94E+001	20.74	7.20E+001
F	11	736-	751	741.71	185.72	0.89	1.02E+003	60.67	8.20E+001
F	12	814-	826	820.13	205.34	0.89	9.05E+001	20.20	5.04E+001
F	13	944-	959	953.21	238.65	0.81	7.74E+001	56.75	6.60E+001
F	14	1400-	1411	1405.06	351.72	1.13	3.96E+001	15.30	2.88E+001
F	15	5824-	5848	5835.76	1460.48	2.81	1.30E+002	23.35	8.33E+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-1483-S-P-6  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\GE\_UNC\_U-NLB.NLB

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

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/gram)	Activity Uncertainty
K-40	0.981	1460.82*	10.66	6.76096E+000	1.34156E+000
U-234	0.993	53.20*	0.12	1.03357E+002	7.90453E+001
		120.90	0.04		
U-235	0.999	105.60	1.31		
		109.19	1.66		
		143.76*	10.96	1.53214E+000	6.48375E-001
		163.36*	5.08	1.30312E+000	3.88395E-001
		202.12	1.08		
		205.32*	5.02	1.56906E+000	4.29395E-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	0.981	6.760961E+000	1.341560E+000
U-234	0.993	1.033567E+002	7.904529E+001
U-235	0.999	1.440816E+000	2.632365E-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: 5/4/2017 8:36:25 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	46.77	5.5929E-002	545.58		
M 3	73.06	5.5765E-002	16.36		
m 4	75.23	1.1899E-001	10.78		
m 5	77.32	3.5088E-002	23.96		
F 6	84.46	1.1264E-001	13.88		
F 7	90.11	5.2372E-002	82.54		
F 8	93.54	7.3044E-002	18.21	Tol.	TH-234
F 11	185.72	5.6803E-001	5.93		
F 13	238.65	4.2978E-002	73.36		
F 14	351.72	2.2002E-002	38.64		

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-1483-S-P-6  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\GE\_UNC\_U-NLB.NLB

	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	9.022E-001	9.02E-001	6.761E+000	3.809E-00
	PA-234	742.81	0.11	9.911E+001	1.75E+001	-3.926E+000	4.564E+00
		766.42	0.32	3.909E+001		1.731E+001	1.819E+00
		1001.03	0.84	1.746E+001		4.893E+000	8.084E+00
	TH-234	63.29	3.70	1.711E+000	1.71E+000	9.957E-001	8.209E-00
		92.38	2.13	3.054E+000		5.899E+000	1.484E+00
		92.80	2.10	2.945E+000		6.636E-001	1.429E+00
		112.81	0.21	2.200E+001		-1.315E+001	1.058E+00
+	U-234	53.20*	0.12	5.468E+001	5.47E+001	1.034E+002	2.596E+00
		120.90	0.04	1.263E+002		4.392E+001	6.057E+00
+	U-235	105.60	1.31	3.259E+000	3.80E-001	-5.123E+000	1.562E+00
		109.19	1.66	2.902E+000		-1.215E+000	1.397E+00
		143.76*	10.96	3.796E-001		1.532E+000	1.812E-00
		163.36*	5.08	6.832E-001		1.303E+000	3.219E-00
		202.12	1.08	5.462E+000		1.690E-001	2.623E+00
		205.32*	5.02	7.026E-001		1.569E+000	3.278E-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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\*\*\* 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-1483\UNC-IMC-148

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	^	6.76E+000	19.843			
U-234	53.2	^	1.03E+002	76.478			
U-235	143.8	^	1.53E+000	42.318	1.000[59.847]	-1.15	0.215
	163.4		1.30E+000	29.805	0.851[51.761]		[ 2.117]
	205.3		1.57E+000	27.366	1.024[50.396]		