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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 8:37:26 AM

Sample Title : UNC-IMC-1483-S-P-7

Sample Description :

Sample Identification : IMC-1483-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 : 3.200E+002 grams

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

Acquisition Started : 4/25/2017 10:57:24 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-7

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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-7

Peak Analysis Performed on: 5/4/2017 8:37:23 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	180-	192	186.19	46.70	0.85	1.10E+002	66.76	9.10E+001
F	2	209-	221	212.91	53.39	0.68	6.29E+001	16.84	7.37E+001
M	3	287-	304	291.47	73.05	0.68	7.61E+001	46.86	1.08E+002
m	4	287-	304	299.94	75.17	0.68	1.50E+002	70.55	2.00E+002
F	5	330-	343	337.22	84.50	0.89	1.63E+002	25.94	1.40E+002
F	6	356-	364	359.72	90.13	0.83	8.48E+001	19.71	7.35E+001
F	7	366-	380	372.47	93.32	0.93	1.12E+002	82.25	1.53E+002
F	8	569-	582	574.38	143.85	0.75	2.06E+002	91.05	7.70E+001
F	9	645-	659	653.11	163.55	0.67	7.21E+001	57.22	9.00E+001
F	10	735-	749	741.80	185.74	0.98	9.21E+002	119.73	7.50E+001
F	11	814-	826	820.17	205.35	1.11	7.96E+001	18.66	4.55E+001
F	12	945-	960	953.00	238.59	1.12	7.13E+001	61.37	6.60E+001
F	13	1175-	1184	1179.15	295.19	0.70	2.18E+001	13.17	3.30E+001
F	14	1399-	1410	1405.19	351.75	0.77	3.72E+001	43.45	1.92E+001
F	15	5823-	5850	5835.87	1460.50	2.93	1.49E+002	24.60	6.22E+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-7  
 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	0.984	1460.82*	10.66	8.33330E+000	1.54936E+000
U-234	0.996	53.20*	0.12	6.53480E+001	2.35643E+001
		120.90	0.04		
U-235	0.998	105.60	1.31		
		109.19	1.66		
		143.76*	10.96	1.38292E+000	6.70808E-001
		163.36*	5.08	1.11894E+000	9.12333E-001
		202.12	1.08		
		205.32*	5.02	1.47137E+000	4.16373E-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	0.984	8.333299E+000	1.549357E+000
U-234	0.996	6.534798E+001	2.356428E+001
U-235	0.998	1.403918E+000	3.298364E-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 8:37:23 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	46.70	6.1044E-002	60.75		
M 3	73.05	4.2251E-002	61.62		
m 4	75.17	8.3440E-002	46.98		
F 5	84.50	9.0731E-002	15.89		
F 6	90.13	4.7109E-002	23.24		
F 7	93.32	6.2420E-002	73.21	Tol.	TH-234 TH-234
F 10	185.74	5.1162E-001	13.00		
F 12	238.59	3.9608E-002	86.08		
F 13	295.19	1.2097E-002	60.48		
F 14	351.75	2.0642E-002	116.95		

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-7  
 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	8.862E-001	8.86E-001	8.333E+000	3.673E-00
	PA-234	742.81	0.11	1.223E+002	1.53E+001	1.155E+001	5.696E+00
		766.42	0.32	4.235E+001		2.753E+001	1.972E+00
		1001.03	0.84	1.534E+001		9.960E-001	6.973E+00
	TH-234	63.29	3.70	1.778E+000	1.78E+000	1.023E+000	8.535E-00
		92.38	2.13	3.153E+000		6.222E+000	1.531E+00
		92.80	2.10	3.036E+000		2.548E-001	1.472E+00
		112.81	0.21	2.099E+001		-2.962E+001	1.005E+00
+	U-234	53.20*	0.12	5.505E+001	5.51E+001	6.535E+001	2.612E+00
		120.90	0.04	1.311E+002		-3.071E+001	6.285E+00
+	U-235	105.60	1.31	3.657E+000	3.40E-001	8.039E-001	1.757E+00
		109.19	1.66	2.841E+000		-3.300E+000	1.364E+00
		143.76*	10.96	3.403E-001		1.383E+000	1.611E-00
		163.36*	5.08	8.633E-001		1.119E+000	4.106E-00
		202.12	1.08	5.360E+000		4.453E-001	2.565E+00
		205.32*	5.02	7.147E-001		1.471E+000	3.323E-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	^	8.33E+000	18.592			
U-234	53.2	^	6.53E+001	36.060			
U-235	143.8	^	1.38E+000	48.507	1.000[68.599]	-1.47	0.283
	163.4		1.12E+000	81.536	0.809[94.873]		[ 2.437]
	205.3		1.47E+000	28.298	1.064[56.158]		