DOE ETEC Release of Baker Tank 907MEA

Infiltrated groundwater from building 4024 in Baker tank 907MEA has been sampled and analyzed (ENV120009).

No anthropogenic radionuclides have been detected.

The water is released for disposal with no radiological restrictions.

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*********************************************************************
*****              T H E  B O E I N G  C O M P A N Y              *****
*****   S A N T A  S U S A N A  F I E L D  L A B O R A T O R Y     *****
*****      S H E A -  R A D I A T I O N  S A F E T Y  L A B       *****
*****                                                             *****
*****  G A M M A  S P E C T R U M  A N A L Y S I S  R E P O R T   *****
*********************************************************************
```

Report Generated On : 5/11/12 2:52:38 PM

Sample Identification : ENV120009
Spectrum Description : Water Sample from Tank 907MEA
MCA Number : ENV120009
Sample Type : Water
Sample Geometry : 2

Peak Locate Threshold : 2.00
Peak Locate Range (in channels) : 25 - 4096
Peak Area Range (in channels) : 25 - 4096
Identification Energy Tolerance : 1.500 FWHM

Sample Size : 1.120E+000 L

Sample Taken On : 5/11/12 12:00:00 PM
Acquisition Started : 5/11/12 2:28:18 PM

Live Time : 1000.0 seconds
Real Time : 1000.0 seconds

Energy Calibration Used Done On : 6/16/11
Efficiency Calibration Used Done On : 6/16/11

Report Reviewed and
Conforms to RS-00017 By: _____ Date: _____

Radiation Safety

```
*********************************************************************
*****              T H E  B O E I N G  C O M P A N Y              *****
*****   S A N T A  S U S A N A  F I E L D  L A B O R A T O R Y     *****
*****      S H E A -  R A D I A T I O N  S A F E T Y  L A B       *****
*****                                                             *****
*****  G A M M A  S P E C T R U M  A N A L Y S I S  R E P O R T   *****
*********************************************************************


Report Generated On             : 5/11/12   2:52:38 PM

Sample Identification           : ENV120009
Spectrum Description            : Water Sample from Tank 907MEA
MCA Number                      : ENV120009
Sample Type                     : Water
Sample Geometry                 : 2

Peak Locate Threshold           :  2.00
Peak Locate Range (in channels) :    25 -  4096
Peak Area Range (in channels)   :    25 -  4096
Identification Energy Tolerance :    1.500 FWHM

Sample Size                     :  1.120E+000 L

Sample Taken On                 : 5/11/12  12:00:00 PM
Acquisition Started             : 5/11/12   2:28:18 PM

Live Time                       :     1000.0 seconds
Real Time                       :     1000.0 seconds


          Energy Calibration Used Done On       : 6/16/11
          Efficiency Calibration Used Done On   : 6/16/11


     Report Reviewed and
     Conforms to RS-00017      By: ____________________  Date: __________

                                     Radiation Safety
     NOTE:COPY1
```

****
***** E N E R G Y C A L I B R A T I O N R E P O R T *****
****

Detector Name: MAINDET
Sample Identification: ENV120009

********** ENERGY CALIBRATION COEFFICIENTS **********

Energy Calibrate Performed on: 6/16/11 4:17:23 PM
by:
Energy Calibrate Type: POLY

Energy(keV) = 0.516 + 0.488*ch + 0.00E+000*ch^2 + 0.00E+000*ch^3

********** SHAPE CALIBRATION COEFFICIENTS **********

Shape Calibrate Performed on: 6/16/11 4:17:23 PM
by:

FWHM = 0.865 + 0.025*E^1/2

LOW TAIL = 4.6E-001 + 2.9E-005*E

********** ENERGY CALIBRATION RESULTS TABLE **********

Centroid Channel	Centroid error	Energy (keV)
94.53	0.01	46.52
121.02	0.01	59.54
179.25	0.01	88.04
248.87	0.01	122.00
338.60	0.01	165.85
570.73	0.01	279.00
801.21	0.01	392.00
1051.72	0.01	514.00
1354.24	0.03	661.62
1838.93	0.03	898.00
2403.17	0.04	1173.23
2729.80	0.07	1332.51
3762.35	0.05	1836.10

********* SHAPE CALIBRATION RESULTS TABLE *********

Energy (keV)	FWHM channels	FWHM error	TAIL channels	TAIL error
46.52	2.19	0.01	0.95	0.00
59.54	2.22	0.01	0.95	0.00
88.04	2.26	0.01	0.95	0.00
122.00	2.33	0.01	0.95	0.00
165.85	2.40	0.01	0.95	0.00
279.00	2.56	0.01	0.96	0.00
392.00	2.72	0.01	0.97	0.00
514.00	2.92	0.01	0.97	0.00
661.62	3.10	0.02	0.98	0.00
898.00	3.41	0.02	1.00	0.00
1173.23	3.76	0.03	1.01	0.00

1332.51	3.82	0.05	1.02	0.00
1836.10	4.46	0.03	1.05	0.00

****
***** E F F I C I E N C Y C A L I B R A T I O N R E P O R T *****
****

Detector Name: MAINDET
Sample Identification: ENV120009

Geometry Description: 2
Efficiency Calibration Performed on: 6/16/11 4:19:57 PM
by:

Efficiency Triplets
==========

Energy	Efficiency	Error
46.52	5.61E-002	2.30E-003
59.54	3.69E-002	1.31E-003
88.04	3.65E-002	1.80E-003
122.00	4.83E-002	2.03E-003
165.85	3.90E-002	1.56E-003
279.00	2.61E-002	1.05E-003
392.00	1.87E-002	7.47E-004
514.00	1.44E-002	5.04E-004
661.62	1.15E-002	4.72E-004
898.00	8.36E-003	3.35E-004
1173.23	6.71E-003	2.69E-004
1332.51	5.86E-003	2.35E-004
1836.10	4.34E-003	1.74E-004

DUAL Efficiency Calibration Equation
==========

Single Equation Terms ->	
Offset:	-12.408
Slope:	5.198
Quadratic:	-0.885
Cubic:	0.042
4th Order:	0.000
5th Order:	0.000
6th Order:	0.000
7th Order:	0.000
8th Order:	0.000
9th Order:	0.000

EMPIRICAL Efficiency Calibration Equation

Empirical Equation Terms ->	Scaling:	941.310
	Offset:	-4.830
	Slope:	0.730
	Quadratic:	0.191
	Cubic:	0.450
	4th Order:	-0.433
	5th Order:	0.086

LINEAR Efficiency Calibration Equation

Linear Equation Terms ->	Offset:	-0.000
	Slope:	-2.210
	Quadratic:	288.499
	Cubic:	-32288.631
	4th Order:	1384794.875
	5th Order:	-19057146.0
	6th Order:	0.000
	7th Order:	0.000
	8th Order:	0.000
	9th Order:	0.000

****
***** P E A K L O C A T E R E P O R T *****
****

Detector Name: MAINDET
Sample Identification: ENV120009
Peak Locate Performed on: 5/11/12 2:52:34 PM
Peak Locate From Channel: 25
Peak Locate To Channel: 4096
Peak Search Sensitivity: 2.00

Peak No.	Centroid Channel	Centroid Uncertainty	Energy (keV)	Peak Significance
1	26.22	0.6095	13.28	2.10
2	603.97	0.4915	295.28	2.25
3	719.49	0.4044	351.75	3.10
4	2294.61	0.4909	1120.41	2.04

Errors quoted at 2.000 sigma

****
***** P E A K A N A L Y S I S R E P O R T *****
****

Detector Name: MAINDET
Sample Identification: ENV120009
Peak Analysis Performed on: 5/11/12 2:52:34 PM
Peak Analysis From Channel: 25
Peak Analysis To Channel: 4096

	Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
F	1	22-	30	26.15	13.28	1.48E+001	11.02	2.93E+001
F	2	599-	609	603.89	295.28	1.62E+001	8.98	1.44E+001
F	3	716-	724	719.58	351.75	2.20E+001	12.01	9.00E+000
F	4	2292-	2297	2294.33	1120.41	3.96E+000	0.83	1.20E+000

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet

Errors quoted at 2.000 sigma

****
***** P E A K E F F I C I E N C Y R E P O R T *****
****

Detector Name: MAINDET
Sample Identification: ENV120009
Peak Analysis Performed on: 5/11/12 2:52:34 PM

	Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty
F	1	13.28	1.48E+001	11.02	1.57E-002	7.45E-003
F	2	295.28	1.62E+001	8.98	2.40E-002	8.49E-004
F	3	351.75	2.20E+001	12.01	2.08E-002	7.20E-004
F	4	1120.41	3.96E+000	0.83	6.94E-003	2.44E-004

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet

Errors quoted at 2.000 sigma

****
***** B A C K G R O U N D S U B T R A C T R E P O R T *****
****

Detector Name: MAINDET
Sample Identification: ENV120009
Peak Analysis Performed on: 5/11/12 2:52:34 PM

	Peak No.	Energy (keV)	Original Area	Orig. Area Uncert.	Ambient Background	Backgr. Uncert.	Subtracted Area	Subtracted Uncert.
F	1	13.28	1.48E+001	11.02			1.48E+001	1.10E+001
F	2	295.28	1.62E+001	8.98			1.62E+001	8.98E+000
F	3	351.75	2.20E+001	12.01			2.20E+001	1.20E+001
F	4	1120.41	3.96E+000	0.83			3.96E+000	8.31E-001

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet

Errors quoted at 2.000 sigma

```
************************************************************************
*****          A R E A   C O R R E C T I O N   R E P O R T          *****
*****      R E F E R E N C E   P E A K / B K G . S U B T R A C T    *****
************************************************************************
```

Detector Name: MAINDET
Sample Identification: ENV120009
Peak Analysis Performed on: 5/11/12 2:52:34 PM

Ref. Peak Energy: 0.00; Reference Date:
Peak Ratio: 0.00; Uncertainty: 0.00
Background File : C:\GENIE2K\CAMFILES_WeeklyQC\BM031610M.CNF

Corrected area is: Original * Peak Ratio - Background

	Peak No.	Energy (keV)	Original Area	Orig. Area Uncert.	Ambient Background	Backgr. Uncert.	Corrected Area	Corrected Uncert.
F	1	13.28	1.48E+001	11.02			1.48E+001	1.10E+001
F	2	295.28	1.62E+001	8.98			1.62E+001	8.98E+000
F	3	351.75	2.20E+001	12.01			2.20E+001	1.20E+001
F	4	1120.41	3.96E+000	0.83			3.96E+000	8.31E-001

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet

Errors quoted at 2.000 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 Identification: ENV120009
Nuclide Library Used: C:\GENIE2K\CAMFILES\LIBRARY0.NLB

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

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/L)	Activity Uncertainty
BI-214U	1.000	387.00	0.36		
		389.00	0.41		
		426.50	0.11		
		454.77	0.32		
		609.31	46.30		
		665.45	1.56		
		703.11	0.47		
		719.86	0.40		
		768.36	5.04		
		806.17	1.23		
		934.06	3.21		
		1051.96	0.32		
		1120.29*	15.10	9.115E+001	1.939E+001
		1133.66	0.25		
		1155.19	1.69		
		1207.68	0.46		
		1238.11	5.94		
		1280.96	1.47		
		1377.67	4.11		
		1385.31	0.78		
		1401.50	1.39		
		1407.98	2.48		
		1509.19	2.19		
		1538.50	0.41		
		1543.32	0.35		
		1583.22	0.72		
		1599.31	0.33		
		1661.28	1.15		
		1683.99	0.23		
		1729.60	3.05		
		1764.49	15.80		
		1838.36	0.38		
		1847.44	2.12		
		1873.16	0.23		
		1896.30	0.18		
		2118.54	1.21		
PB-214U	1.000	53.20	1.10		
		74.81	6.33		
		77.11	10.70		
		87.20	3.70		
		89.80	1.03		
		241.98	7.49		

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/L)	Activity Uncertainty
PB-214U	1.000	258.82	0.55		
		274.53	0.32		
		295.21*	19.20	8.487E+001	4.709E+001
		351.92*	37.20	6.857E+001	3.746E+001
		462.10	0.17		
		480.50	0.34		
		487.25	0.44		
		580.30	0.36		
		785.91	1.10		
		839.03	0.59		

* = Energy line found in the spectrum.
Energy Tolerance : 1.500 FWHM
Nuclide confidence index threshold = 0.60
Errors quoted at 2.000 sigma

********** U N I D E N T I F I E D P E A K S **********

Peak Locate Performed on: 5/11/12 2:52:34 PM
Peak Locate From Channel: 25
Peak Locate To Channel: 4096

	Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty
F	1	13.28	1.4842E-002	74.25

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet

Errors quoted at 2.000 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 Identification: ENV120009
     Nuclide Library Used:  C:\GENIE2K\CAMFILES\LIBRARY0.NLB

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

   Nuclide    Id       Energy   Yield  Activity     Activity   Activity  GPS
   Name    Confidence  (keV)     (%)  (pCi/L     ) Uncertainty  (GPS)  Uncert.

   BI-214U   1.000   387.00     0.36
                    389.00     0.41
                    426.50     0.11
                    454.77     0.32
                    609.31    46.30
                    665.45     1.56
                    703.11     0.47
                    719.86     0.40
                    768.36     5.04
                    806.17     1.23
                    934.06     3.21
                   1051.96     0.32
                     1120.29*   15.10 9.115E+001 1.94E+001  5.093E-001 1.08E+005
                   1133.66     0.25
                   1155.19     1.69
                   1207.68     0.46
                   1238.11     5.94
                   1280.96     1.47
                   1377.67     4.11
                   1385.31     0.78
                   1401.50     1.39
                   1407.98     2.48
                   1509.19     2.19
                   1538.50     0.41
                   1543.32     0.35
                   1583.22     0.72
                   1599.31     0.33
                   1661.28     1.15
                   1683.99     0.23
                   1729.60     3.05
                   1764.49    15.80
                   1838.36     0.38
                   1847.44     2.12
                   1873.16     0.23
                   1896.30     0.18
                   2118.54     1.21
   PB-214U   1.000    53.20     1.10
                     74.81  @  6.33
                     77.11  @ 10.70
                     87.20  @  3.70
                     89.80  @  1.03
                    241.98     7.49
```

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/L)	Activity Uncertainty	Activity (GPS)	GPS Uncert.
PB-214U	1.000	258.82	0.55				
		274.53	0.32				
		295.21*	19.20	8.487E+001	4.71E+001	6.029E-001	3.35E+005
		351.92*	37.20	6.857E+001	3.75E+001	9.438E-001	5.16E+005
		462.10	0.17				
		480.50	0.34				
		487.25	0.44				
		580.30	0.36				
		785.91	1.10				
		839.03	0.59				

* = Energy line found in the spectrum.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 1.500 FWHM
Nuclide confidence index threshold = 0.60
Errors quoted at 2.000 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 1 *****
************************************************************************
```

Sample Identification : ENV120009

	Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/L)	Wt mean Activity Uncertainty	Percent Total Act.	Nuclide MDA (pCi/L)
X	BI-211A	0.994				0.000E+000
	BI-214U	1.000	9.115E+001	1.939E+001	54.9%	9.669E+001
	PB-214U @	1.000	7.489E+001	2.932E+001	45.1%	5.337E+001

Total Sample Activity... 1.6604E+002 pCi/L

? = 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 2.000 sigma

********** U N I D E N T I F I E D P E A K S **********

Peak Locate Performed on: 5/11/12
Peak Locate From Channel: 25
Peak Locate To Channel: 4096

	Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty
F	1	13.28	1.4842E-002	74.25

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet

Errors quoted at 2.000 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 2 *****
************************************************************************
```

Sample Identification : ENV120009

	Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/L)	Wt mean Activity Uncertainty	Percent Total Act.	Nuclide MDA (pCi/L)
X	BI-211A	0.994				0.000E+000
	BI-214U	1.000	9.115E+001	1.939E+001	54.90%	9.669E+001
	PB-214U @	1.000	7.489E+001	2.932E+001	45.10%	5.337E+001

Total Sample Activity... 1.6604E+002 pCi/L

? = 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 2.000 sigma

****
***** N U C L I D E M D A R E P O R T *****
****

Detector Name: MAINDET
Sample Geometry: 2
Sample Title: ENV120009
Nuclide Library Used: C:\GENIE2K\CAMFILES\LIBRARY0.NLB

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/L)	Nuclide MDA (pCi/L)	Activity (pCi/L)
NA-22	1274.54	99.94	5.1887E+001	5.19E+001	1.4090E+001
K-40	1460.81	10.67	5.1010E+002	5.10E+002	7.9626E+001
CR-51	320.08	9.83	2.3296E+002	2.33E+002	-6.0790E+001
MN-54	834.83	99.97	3.6548E+001	3.65E+001	-1.7104E+001
Co-57	122.06	85.50	1.4699E+001	1.47E+001	-1.1227E+001
	136.48	10.60	1.6435E+002		4.6251E+001
CO-58	810.76	99.40	3.8050E+001	3.80E+001	1.3828E+001
FE-59	142.65	1.03	1.5342E+003	5.61E+001	-1.6930E+002
	192.34	3.11	6.1007E+002		-1.1514E+002
	1099.22	56.50	5.6138E+001		-6.0454E+000
	1291.56	43.20	1.0003E+002		1.5488E+001
CO-60	1173.22	100.00	5.4666E+001	4.45E+001	1.5810E+001
	1332.49	100.00	4.4513E+001		-1.5391E+001
Zn-65	1115.55	50.60	1.0855E+002	1.09E+002	-5.0630E+001
Y-88	898.02	93.40	3.5846E+001	3.58E+001	-5.9685E-001
	1836.01	99.38	5.3035E+001		-3.3316E+000
NB-94	702.63	100.00	3.9639E+001	3.25E+001	6.7551E-001
	871.10	100.00	3.2458E+001		6.8906E+000
ZR-95	724.18	43.70	8.1820E+001	6.39E+001	9.6693E+000
	756.72	55.30	6.3894E+001		1.2157E+000
RU-106	621.84	9.80	2.9752E+002	2.98E+002	-4.5288E+001
	1050.47	1.73	2.4698E+003		1.5071E+002
SB-125	176.33	6.89	2.5109E+002	8.81E+001	-4.3504E+001
	380.43	1.50	1.6601E+003		1.2822E+002
	427.89	29.33	8.8060E+001		3.0213E+000
	463.38	10.35	2.4808E+002		-7.2632E+001
	600.56	17.80	1.9133E+002		5.4663E+001
	606.64	5.02	9.4494E+002		4.6405E+002
	635.90	11.32	1.8865E+002		-1.8926E+002
	671.41	1.81	1.6292E+003		3.8507E+002
I-129	29.46	19.00	9.3083E+001	4.79E+001	-4.5964E+001
	29.78	36.00	4.7933E+001		-2.7071E+001
	33.60	10.00	1.6634E+002		-5.9890E+001
	39.85	7.50	2.0496E+002		7.2006E+001
BA-133	276.40	6.90	3.0291E+002	5.58E+001	2.5845E+001
	302.84	17.80	1.3837E+002		2.3241E+001
	356.01	60.00	5.5789E+001		-7.7996E+000
	383.85	8.70	2.7934E+002		-7.2245E+001
CS-134	475.35	1.46	1.8742E+003	4.34E+001	-7.7501E+001
	563.23	8.38	3.6722E+002		-7.8421E+001
	569.32	15.43	1.8351E+002		2.3711E+001
	604.70	97.60	4.5538E+001		1.1174E+001

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/L)	Nuclide MDA (pCi/L)	Activity (pCi/L)
CS-134	795.84	85.40	4.3441E+001	4.34E+001	8.1003E+000
	801.93	8.73	4.9670E+002		9.2387E+001
	1038.57	1.00	3.4683E+003		-8.5916E+002
	1167.94	1.80	2.6397E+003		-6.2821E+002
	1365.15	3.04	1.0255E+003		9.2903E+001
CS-137	661.65	85.12	3.4152E+001	3.42E+001	-3.8746E+000
La-138	788.00	33.00	7.9800E+001	7.16E+001	-4.0030E+001
	1436.00	67.00	7.1575E+001		1.2929E+001
EU-152	121.78	28.40	4.5389E+001	4.54E+001	-2.2626E+001
	244.69	7.49	2.8577E+002		1.0776E+002
	275.40	0.03	6.3625E+004		-5.5140E+003
	344.27	26.50	8.0805E+001		-3.2196E+000
	411.11	2.21	9.9858E+002		1.5147E+002
	443.98	3.11	6.4305E+002		5.6996E+001
	671.30	0.02	1.3524E+005		3.1964E+004
	778.89	12.74	2.2801E+002		-4.4609E+001
	867.32	4.16	9.1214E+002		2.1128E+002
	964.01	14.40	3.2944E+002		3.2184E+001
	1085.78	10.00	4.0460E+002		-3.5032E+002
	1112.02	13.30	3.1158E+002		4.5396E+001
	1407.95	20.70	1.9596E+002		4.2206E+001
EU-154	123.07	40.40	2.9442E+001	2.94E+001	-2.8908E+001
	188.25	0.23	8.6353E+003		-1.1004E+002
	247.93	6.83	2.7493E+002		-1.2252E+002
	401.30	0.19	1.0659E+004		5.3743E+003
	444.39	0.55	3.6392E+003		3.2256E+002
	478.26	0.21	1.4531E+004		6.6821E+003
	557.56	0.25	1.2916E+004		4.1168E+003
	582.00	0.89	3.3967E+003		-1.8798E+003
	591.76	4.91	6.5681E+002		1.4479E+002
	625.22	0.32	8.6549E+003		-6.5052E+003
	676.59	0.14	2.0306E+004		-5.3902E+003
	692.42	1.78	2.1954E+003		1.3314E+003
	715.76	0.17	2.0770E+004		2.9127E+003
	723.20	20.00	1.7834E+002		1.6580E+001
	756.86	4.50	7.3677E+002		-1.2538E+002
	815.55	0.50	5.4492E+003		-2.7335E+003
	845.39	0.58	6.7907E+003		-7.4941E+002
	850.64	0.23	1.8205E+004		7.0854E+003
	873.20	12.09	2.4119E+002		-9.7088E+001
	892.73	0.50	7.3340E+003		1.4545E+003
	904.05	0.85	3.0635E+003		-2.9031E+003
	996.30	10.34	3.2172E+002		-1.0560E+002
	1004.76	17.90	1.6168E+002		-1.1143E+002
	1128.40	0.29	1.8004E+004		-2.6378E+003
	1140.90	0.22	1.9416E+004		-4.2027E+003
	1241.60	0.13	3.2918E+004		4.4850E+003
	1246.60	0.80	4.4904E+003		-1.2573E+003
	1274.51	34.40	1.5073E+002		4.0932E+001
	1274.51	34.40	1.5073E+002		4.0932E+001
	1494.08	0.71	4.8162E+003		-1.0908E+003

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/L)	Nuclide MDA (pCi/L)	Activity (pCi/L)
	EU-154	1596.45	1.80	3.3014E+003	2.94E+001	1.0994E+003
	EU-155	60.01	1.21	1.4914E+003	7.35E+001	8.2530E+000
		86.06	0.16	9.6064E+003		3.0407E+003
		105.31	21.80	7.3473E+001		2.5679E+000
	IR-192	61.49	1.21	1.5567E+003	2.81E+001	9.4458E+002
		63.00	2.10	8.8458E+002		6.5587E+002
		65.12	2.68	6.4496E+002		8.3087E+001
		66.83	4.59	3.5155E+002		-2.4759E+002
		71.40	0.90	1.8406E+003		1.1540E+002
		75.70	2.00	9.3268E+002		3.9292E+002
		136.34	0.18	9.5220E+003		1.1991E+003
		201.31	0.47	4.6382E+003		2.2696E+003
		205.80	3.30	5.6507E+002		-2.1166E+002
		283.27	0.26	7.7040E+003		6.8146E+001
		295.96	28.67	1.0898E+002		6.4092E+001
		308.46	30.00	8.8495E+001		4.5043E+001
		316.51	82.81	2.8096E+001		1.8875E-002
		374.49	0.72	3.0752E+003		-2.6203E+002
		416.47	0.66	2.8478E+003		-7.8247E+002
		468.07	47.83	5.4225E+001		1.5565E+000
		484.58	3.18	8.7654E+002		7.2491E+001
		489.04	0.44	6.5853E+003		5.8307E+002
		588.58	4.51	6.4786E+002		-1.2454E+002
		604.41	8.23	4.7621E+002		-2.2517E+002
		612.47	5.31	9.0253E+002		4.1938E+002
		884.54	0.29	1.3251E+004		5.6375E+003
	Tl-208T	233.50	0.30	6.9020E+003	3.37E+001	-4.8282E+002
		277.36	6.50	3.0526E+002		-6.3332E+001
		583.14	86.00	3.3681E+001		-2.4412E+001
		763.30	1.70	1.9666E+003		-1.4037E+003
		860.47	12.00	2.6720E+002		-6.1173E+001
		927.70	0.13	3.5117E+004		1.7707E+004
		982.80	0.20	2.1495E+004		8.0779E+003
		1093.90	0.38	1.0727E+004		-1.7861E+002
	PB-210U	46.52	4.00	3.1961E+002	3.20E+002	6.2298E+001
	BI-212T	39.86	1.10	1.3973E+003	2.88E+002	4.9090E+002
		727.17	11.80	2.8762E+002		-7.8258E+001
		785.42	2.00	1.4644E+003		1.7069E+002
		1620.56	2.75	4.9405E+002		0.0000E+000
	PB-212T	74.81	9.60	2.0265E+002	5.08E+001	1.7638E+002
		77.11	17.50	1.0267E+002		4.1842E+001
		87.20	6.30	2.4257E+002		-1.7148E+002
		89.80	1.75	1.0830E+003		6.6476E+002
		115.19	0.60	2.9060E+003		7.1955E+002
		176.66	0.05	3.3926E+004		-1.1195E+004
		238.63	44.60	5.0793E+001		1.3360E+001
		300.09	3.41	6.3618E+002		-1.9771E+002
+	BI-214U	387.00	0.36	6.2667E+003	9.67E+001	-3.1410E+001
		389.00	0.41	5.5445E+003		1.7994E+003
		426.50	0.11	2.1089E+004		-5.4488E+003
		454.77	0.32	8.8664E+003		1.5929E+003

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/L)	Nuclide MDA (pCi/L)	Activity (pCi/L)
+	BI-214U	609.31	46.30	9.6686E+001	9.67E+001	4.4655E+001
		665.45	1.56	2.3100E+003		1.0795E+003
		703.11	0.47	9.0323E+003		1.8046E+003
		719.86	0.40	8.3407E+003		2.6979E+002
		768.36	5.04	8.2467E+002		4.7342E+002
		806.17	1.23	3.3899E+003		5.9671E+002
		934.06	3.21	1.0841E+003		-1.7599E+002
		1051.96	0.32	1.2423E+004		-2.0686E+002
		1120.29*	15.10	1.6759E+002		9.1154E+001
		1133.66	0.25	1.9491E+004		-4.4226E+003
		1155.19	1.69	2.7805E+003		-2.4602E+002
		1207.68	0.46	8.7699E+003		5.4312E+002
		1238.11	5.94	6.9629E+002		2.5873E+001
		1280.96	1.47	1.9899E+003		-1.8929E+003
		1377.67	4.11	1.2493E+003		2.5135E+002
		1385.31	0.78	5.1172E+003		-2.2961E+002
		1401.50	1.39	8.4653E+002		0.0000E+000
		1407.98	2.48	1.6357E+003		3.5229E+002
		1509.19	2.19	2.5669E+003		4.8082E+002
		1538.50	0.41	1.0730E+004		-3.8517E+003
		1543.32	0.35	1.2558E+004		2.7048E+003
		1583.22	0.72	6.3514E+003		-2.7929E+003
		1599.31	0.33	1.3771E+004		-3.9545E+003
		1661.28	1.15	1.2106E+003		0.0000E+000
		1683.99	0.23	2.0672E+004		-1.6696E+003
		1729.60	3.05	1.2912E+003		-5.2641E+002
		1764.49	15.80	3.7181E+002		4.0296E+001
		1838.36	0.38	1.3759E+004		-1.1112E+003
		1847.44	2.12	2.8975E+003		2.0935E+002
		1873.16	0.23	2.3763E+004		5.1179E+003
		1896.30	0.18	8.9521E+003		0.0000E+000
>		2118.54	1.21	0.0000E+000		0.0000E+000
+	PB-214U	53.20	1.10	1.2253E+003	5.34E+001	-9.6106E+001
		74.81	6.33	3.0734E+002		2.6750E+002
		77.11	10.70	1.6791E+002		6.8433E+001
		87.20	3.70	4.1303E+002		-2.9197E+002
		89.80	1.03	1.8400E+003		1.1294E+003
		241.98	7.49	2.9471E+002		5.9834E+001
		258.82	0.55	4.2141E+003		1.1568E+003
		274.53	0.32	6.1524E+003		-1.8553E+003
		295.21*	19.20	1.1579E+002		8.4867E+001
		351.92*	37.20	5.3365E+001		6.8567E+001
		462.10	0.17	1.6279E+004		1.4053E+003
		480.50	0.34	8.4345E+003		-1.0082E+003
		487.25	0.44	6.3609E+003		-2.7100E+002
		580.30	0.36	9.8338E+003		3.0752E+003
		785.91	1.10	2.6642E+003		-3.5489E+002
		839.03	0.59	7.3528E+003		3.1965E+003
	RN-219A	271.23	9.90	2.1341E+002	2.13E+002	-6.3384E+001
		401.78	6.60	3.1200E+002		1.1000E+002
	RA-223A	81.07	15.00	9.6132E+001	6.12E+001	-5.4779E+001

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/L)	Nuclide MDA (pCi/L)	Activity (pCi/L)
RA-223A	83.78	24.80	6.1187E+001	6.12E+001	1.8695E+001
	94.90	11.30	1.6161E+002		7.6152E+001
	122.31	1.19	9.6570E+002		-1.1858E+003
	144.20	3.26	4.6718E+002		-4.8609E+001
	154.19	5.59	3.1515E+002		3.9295E+001
	158.62	0.69	2.7251E+003		5.7196E+001
	179.67	0.15	1.2734E+004		-9.9856E+002
	269.41	13.60	1.7559E+002		5.2792E+001
	288.17	0.15	1.4014E+004		-1.1486E+003
	323.89	3.90	5.7494E+002		-5.5480E+001
	328.50	0.20	1.1456E+004		1.9345E+002
	338.32	2.78	8.8286E+002		2.7758E+002
	342.90	0.20	9.8750E+003		-6.0375E+003
	371.84	0.49	3.4937E+003		-3.7779E+003
	444.94	1.27	1.5778E+003		3.8690E+002
RA-224T	240.99	3.97	5.8445E+002	5.84E+002	3.6899E+002
RA-226U	186.21	3.28	6.0677E+002	6.07E+002	-1.5920E+002
TH-227A	50.20	8.50	1.4105E+002	1.41E+002	-5.3531E+001
	79.77	2.10	7.8697E+002		5.7183E+000
	85.44	1.58	9.4942E+002		7.9707E+001
	88.48	2.82	5.7424E+002		-5.3690E+002
	94.00	1.40	1.3014E+003		7.3660E+002
	113.20	0.74	2.2483E+003		1.1942E+002
	154.20	0.10	1.7618E+004		2.1967E+003
	210.65	1.13	1.6739E+003		-9.0811E+002
	234.90	0.45	4.9787E+003		1.9815E+003
	236.00	11.20	2.0070E+002		5.1182E+001
	250.20	0.50	3.7803E+003		-1.6847E+003
	254.40	0.80	2.8069E+003		9.3042E+002
	256.25	6.80	3.3835E+002		1.4927E+002
	286.15	1.58	1.2090E+003		-3.9981E+002
	299.90	2.00	1.2220E+003		-8.2645E+001
	304.44	1.05	2.3555E+003		-4.4698E+002
	329.82	2.75	8.7400E+002		1.3857E+002
	334.40	1.00	2.4926E+003		5.3674E+002
AC-228T	57.76	0.52	3.1280E+003	1.23E+002	-6.9236E+002
	89.95	2.10	9.0279E+002		5.5416E+002
	93.35	3.50	5.0873E+002		2.2855E+002
	129.08	2.80	5.7889E+002		1.4575E+002
	145.90	0.22	6.6485E+003		-1.9257E+003
	154.20	0.99	1.7868E+003		2.2278E+002
	184.60	0.10	2.0423E+004		4.5361E+003
	209.28	4.40	4.0950E+002		-1.4767E+002
	270.23	3.60	6.3956E+002		1.1229E+002
	327.64	3.20	7.2748E+002		2.6555E+002
	332.40	0.47	4.9833E+003		2.2647E+002
	338.32	11.20	2.1914E+002		6.8899E+001
	409.51	2.13	1.0325E+003		4.1307E+001
	463.00	4.40	5.5780E+002		-2.0828E+002
	478.20	0.24	1.2676E+004		5.8290E+003
	620.30	0.10	3.0389E+004		-1.8272E+004

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/L)	Nuclide MDA (pCi/L)	Activity (pCi/L)
AC-228T	701.50	0.20	1.9275E+004	1.23E+002	1.2614E+003
	755.20	1.10	3.3773E+003		1.7029E+003
	772.10	1.62	2.2168E+003		2.0247E+002
	782.00	0.55	5.3490E+003		-8.9064E+001
	794.70	4.60	7.5630E+002		9.6529E+001
	835.60	1.82	2.0079E+003		-1.0251E+003
	840.20	0.99	3.7286E+003		-1.3219E+002
	904.20	0.87	2.9935E+003		-2.8368E+003
	911.60	27.70	1.2261E+002		1.4801E+001
	964.60	5.20	9.5876E+002		1.5342E+002
	969.11	16.60	3.0174E+002		8.6914E+001
	1247.10	0.57	6.3549E+003		-1.7793E+003
	1459.20	1.04	5.2227E+003		7.0655E+002
	1495.80	1.05	3.2511E+003		-1.2518E+003
	1501.50	0.58	9.6432E+003		3.2113E+003
	1556.90	0.20	2.5593E+004		7.1325E+003
	1580.20	0.71	7.4204E+003		2.0680E+003
	1587.90	3.71	1.5933E+003		5.3058E+002
	1624.70	0.32	4.2698E+003		0.0000E+000
	1630.40	1.95	2.4064E+003		5.1829E+002
	1638.00	0.54	6.8851E+003		-2.9628E+003
	1666.40	0.21	1.8187E+004		0.0000E+000
TH-228T	131.62	0.11	1.4834E+004	7.33E+003	9.9846E+002
	215.94	0.27	7.3340E+003		1.5899E+003
TH-230U	67.73	0.38	4.2951E+003	4.30E+003	-1.2712E+003
PA-231A	27.36	9.30	2.2589E+002	2.26E+002	3.7113E+001
	283.67	1.60	1.3325E+003		4.6909E+002
	300.08	2.30	9.4318E+002		-2.9313E+002
	302.67	4.60	5.3518E+002		8.9890E+001
	330.07	1.30	1.8500E+003		2.9331E+002
TH-232	59.00	0.19	9.2249E+003	9.22E+003	1.1991E+003
PA-234mU	1001.03	0.85	3.4121E+003	3.41E+003	-1.3228E+003
TH-234U	57.75	0.01	3.1576E+005	4.62E+002	-6.9890E+004
	63.29	3.90	4.6151E+002		2.1027E+002
	112.81	0.25	6.5785E+003		-1.7801E+002
	184.80	0.01	1.9353E+005		2.3377E+004
U-234U	53.10	0.12	1.1426E+004	1.14E+004	-8.9617E+002
	121.00	0.04	3.2933E+004		-7.9929E+003
U-235	89.96	1.50	1.2639E+003	3.68E+001	7.7584E+002
	93.35	2.50	7.1223E+002		3.1996E+002
	105.00	1.00	1.6234E+003		1.1186E+002
	109.14	1.50	1.0956E+003		7.5489E+001
	143.76	10.50	1.4484E+002		-3.7675E+001
	163.35	4.70	4.0523E+002		-1.3680E+002
	182.70	0.40	5.2985E+003		1.8001E+003
	185.71	54.00	3.6796E+001		-1.7794E+000
	194.94	0.59	3.6326E+003		6.4198E+002
	202.12	1.00	2.0256E+003		-3.8393E+002
	205.31	4.70	4.2001E+002		5.7649E+001
U-238	92.60	3.57	5.0324E+002	5.03E+002	2.3148E+002
	766.60	0.21	1.8247E+004		4.6003E+003

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/L)	Nuclide MDA (pCi/L)	Activity (pCi/L)
U-238	1001.03	0.59	4.8868E+003	5.03E+002	-1.8945E+003
AM-241	59.54	36.30	4.8752E+001	4.88E+001	3.7372E+000

+ = 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

No Action Level results available for reporting purposes