

## APPENDIX JJ

# RESRAD BUILD VERSION 3.22 AND RESRAD VERSION 6.3 MODELING CODE DATA

# RESRAD BUILD VERSION 3.22 DATA DCGL CALCULATIONS

Title : Pu-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238.bld

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RESRAD-BUILD Table of Contents

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Title : Pu-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238.bld

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=====
RESRAD-BUILD Input Parameters
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```

```

Number of Sources : 1
Number of Receptors: 1
Total Time : 3.650000E+02 days
Fraction Inside : 5.000000E-01
    
```

```

===== Receptor Information =====
    
```

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	6.000	6.000	1.000	1.000	1.80E+01	1.00E-04

```

===== Receptor-Source Shielding Relationship =====
    
```

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

==== Building Information =====

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m]	Area [m2]	Air Exchanges [m3/hr]
		*****
		* * *
		* * *
		* * *
		* * * <=Q01: 7.20E+01
H1: 2.500		* Room 1 * Q10 : 7.20E+01
		* LAMBDA: 8.00E-01 * * *
Area 36.000		* * *
		*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : Pu-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238.bld

==== Source Information ====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00[m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Radon Release Fraction: 1.000E-01

Contamination::

Nuclide Concentration Dose Conversion Factor (Library: FGR 13 Morbidity)

	Nuclide Concentration [dpm/m2]	Ingestion [mrem/dpm]	Inhalation [mrem/dpm]	Submersion [mrem/yr/ (dpm/m3)]
PU-238	9.000E+03	1.441E-03	1.766E-01	2.572E-07
U-234	0.000E+00	1.275E-04	5.946E-02	4.023E-07
TH-230	0.000E+00	2.468E-04	1.468E-01	9.189E-07
RA-226	0.000E+00	5.991E-04	3.874E-03	4.685E-03
PB-210	0.000E+00	2.419E-03	6.216E-03	4.730E-06

Title : Pu-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238.bld

Evaluation Time: 0.00000000E+00 years

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=====
Assessment for Time: 1
Time =0.00E+00 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	PU-238	9.000E+03
	U-234	0.000E+00
	TH-230	0.000E+00
	RA-226	0.000E+00
	PB-210	0.000E+00

Title : Pu-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238.bld

Evaluation Time: 0.00000000E+00 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	1.47E+01	1.47E+01
Total	1.47E+01	1.47E+01



Title : Pu-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238.bld

Evaluation Time: 0.00000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	1.01E-04	7.47E-06	3.20E-09	1.44E+01	3.52E-18	3.13E-01
Total	1.01E-04	7.47E-06	3.20E-09	1.44E+01	3.52E-18	3.13E-01

Title : Pu-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238.bld

Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
PU-238		
PU-238	1.47E+01	1.47E+01
U-234	6.83E-06	6.83E-06
TH-230	4.95E-11	4.95E-11
RA-226	2.26E-16	2.26E-16
PB-210	2.62E-18	2.62E-18

Title : Pu-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238.bld

Evaluation Time: 1.00000000 years

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Assessment for Time: 2

Time =1.00E+00 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	PU-238	4.465E+03
	U-234	1.271E-02
	TH-230	5.727E-08
	RA-226	8.275E-12
	PB-210	6.393E-14

Title : Pu-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238.bld

Evaluation Time: 1.00000000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	6.69E-05	6.69E-05
Total	6.69E-05	6.69E-05

Title : Pu-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	6.69E-05	0.00E+00	0.00E+00	0.00E+00	4.39E-17	0.00E+00
Total	6.69E-05	0.00E+00	0.00E+00	0.00E+00	4.39E-17	0.00E+00

Title : Pu-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
PU-238		
PU-238	6.69E-05	6.69E-05
U-234	2.35E-10	2.35E-10
TH-230	1.24E-15	1.24E-15
RA-226	3.67E-16	3.67E-16
PB-210	1.59E-20	1.59E-20

Title : Pu-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238.bld

Evaluation Time: 10.0000000 years

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Assessment for Time: 3

Time =1.00E+01 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	PU-238	4.158E+03
	U-234	1.227E-01
	TH-230	5.594E-06
	RA-226	8.121E-09
	PB-210	5.962E-10

Title : Pu-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238.bld

Evaluation Time: 10.0000000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	6.23E-05	6.23E-05
Total	6.23E-05	6.23E-05



Title : Pu-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238.bld

Evaluation Time: 10.0000000 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	6.23E-05	0.00E+00	0.00E+00	0.00E+00	1.34E-14	0.00E+00
Total	6.23E-05	0.00E+00	0.00E+00	0.00E+00	1.34E-14	0.00E+00

Title : Pu-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238.bld

Evaluation Time: 10.0000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
PU-238		
PU-238	6.23E-05	6.23E-05
U-234	1.59E-09	1.59E-09
TH-230	5.73E-14	5.73E-14
RA-226	1.11E-13	1.11E-13
PB-210	2.93E-17	2.93E-17

Title : Pu-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238.bld

Evaluation Time: 100.000008 years

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Assessment for Time: 4
Time =1.00E+02 yr
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```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	PU-238	2.042E+03
	U-234	8.818E-01
	TH-230	4.485E-04
	RA-226	6.804E-06
	PB-210	3.248E-06

Title : Pu-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238.bld

Evaluation Time: 100.000008 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	3.06E-05	3.06E-05
Total	3.06E-05	3.06E-05

Title : Pu-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238.bld

Evaluation Time: 100.000008 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	3.06E-05	0.00E+00	0.00E+00	0.00E+00	9.79E-12	0.00E+00
Total	3.06E-05	0.00E+00	0.00E+00	0.00E+00	9.79E-12	0.00E+00

Title : Pu-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238.bld

Evaluation Time: 100.000008 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
PU-238		
PU-238	3.06E-05	3.06E-05
U-234	1.09E-08	1.09E-08
TH-230	4.20E-12	4.20E-12
RA-226	8.17E-11	8.17E-11
PB-210	1.33E-13	1.33E-13

Title : Pu-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238.bld

Evaluation Time: 1000.00000 years

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=====
Assessment for Time: 5
Time =1.00E+03 yr
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```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	PU-238	1.668E+00
	U-234	1.610E+00
	TH-230	1.263E-02
	RA-226	2.154E-03
	PB-210	2.012E-03

Title : Pu-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238.bld

Evaluation Time: 1000.00000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	7.06E-08	7.06E-08
Total	7.06E-08	7.06E-08



Title : Pu-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238.bld

Evaluation Time: 1000.00000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	6.76E-08	0.00E+00	0.00E+00	0.00E+00	3.06E-09	0.00E+00
Total	6.76E-08	0.00E+00	0.00E+00	0.00E+00	3.06E-09	0.00E+00

Title : Pu-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238.bld

Evaluation Time: 1000.00000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
PU-238		
PU-238	2.50E-08	2.50E-08
U-234	1.99E-08	1.99E-08
TH-230	1.17E-10	1.17E-10
RA-226	2.55E-08	2.55E-08
PB-210	8.14E-11	8.14E-11

Title : Pu-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238.bld

Full Summary

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RESRAD-BUILD Dose (Time) Tables

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Receptor Dose Received for the Exposure Duration

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(mrem)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.47E+01	6.69E-05	6.23E-05	3.06E-05	7.06E-08

Receptor Dose/Yr Averaged Over Exposure Duration

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(mrem/yr)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.47E+01	6.70E-05	6.24E-05	3.06E-05	7.07E-08

Title : U-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238.bld

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For time = 1.00E+00 yr	
Time Specific Parameters.....	9
Receptor-Source Dose Summary.....	10
Dose by Pathway Detail.....	11
Dose by Nuclide Detail.....	12
For time = 1.00E+01 yr	
Time Specific Parameters.....	13
Receptor-Source Dose Summary.....	14
Dose by Pathway Detail.....	15
Dose by Nuclide Detail.....	16
For time = 1.00E+02 yr	
Time Specific Parameters.....	17
Receptor-Source Dose Summary.....	18
Dose by Pathway Detail.....	19
Dose by Nuclide Detail.....	20
For time = 1.00E+03 yr	
Time Specific Parameters.....	21
Receptor-Source Dose Summary.....	22
Dose by Pathway Detail.....	23
Dose by Nuclide Detail.....	24
Full Summary.....	25

Title : U-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238.bld

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RESRAD-BUILD Input Parameters
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```

```

Number of Sources : 1
Number of Receptors: 1
Total Time : 3.650000E+02 days
Fraction Inside : 5.000000E-01
    
```

```

===== Receptor Information =====
    
```

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	6.000	6.000	1.000	1.000	1.80E+01	1.00E-04

```

===== Receptor-Source Shielding Relationship =====
    
```

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

==== Building Information ====

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m]	Area [m2]	Air Exchanges [m3/hr]
		*****
		* * *
		* * *
		* * *
		* * * <=Q01: 7.20E+01
H1: 2.500		* Room 1 * Q10 : 7.20E+01
		* LAMBDA: 8.00E-01 * * *
Area 36.000		* * *
		*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : U-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238.bld

==== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00[m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Radon Release Fraction: 1.000E-01

Contamination::

Nuclide Concentration Dose Conversion Factor (Library: FGR 13 Morbidity)

		Ingestion	Inhalation	Submersion
	[dpm/m2]	[mrem/dpm]	[mrem/dpm]	[mrem/yr/ (dpm/m3)]
U-238	2.900E+04	1.212E-04	5.315E-02	7.207E-05
U-234	0.000E+00	1.275E-04	5.946E-02	4.023E-07
TH-230	0.000E+00	2.468E-04	1.468E-01	9.189E-07
RA-226	0.000E+00	5.991E-04	3.874E-03	4.685E-03
PB-210	0.000E+00	2.419E-03	6.216E-03	4.730E-06

Title : U-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238.bld

Evaluation Time: 0.00000000E+00 years

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Assessment for Time: 1  
Time =0.00E+00 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	U-238	2.900E+04
	U-234	0.000E+00
	TH-230	0.000E+00
	RA-226	0.000E+00
	PB-210	0.000E+00



Title : U-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238.bld

Evaluation Time: 0.00000000E+00 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	1.42E+01	1.42E+01
Total	1.42E+01	1.42E+01

Title : U-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238.bld

Evaluation Time: 0.00000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	4.64E-03	3.45E-04	2.92E-06	1.41E+01	1.13E-17	8.60E-02
Total	4.64E-03	3.45E-04	2.92E-06	1.41E+01	1.13E-17	8.60E-02

Title : U-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238.bld

Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
U-238		
U-238	1.42E+01	1.42E+01
U-234	2.21E-05	2.21E-05
TH-230	1.60E-10	1.60E-10
RA-226	7.29E-16	7.29E-16
PB-210	8.47E-18	8.47E-18

Title : U-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238.bld

Evaluation Time: 1.00000000 years

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Assessment for Time: 2  
Time =1.00E+00 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	U-238	1.450E+04
	U-234	4.111E-02
	TH-230	1.850E-07
	RA-226	2.671E-11
	PB-210	2.063E-13

Title : U-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238.bld

Evaluation Time: 1.00000000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	3.09E-03	3.09E-03
Total	3.09E-03	3.09E-03

Title : U-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	3.09E-03	0.00E+00	0.00E+00	0.00E+00	1.42E-16	0.00E+00
Total	3.09E-03	0.00E+00	0.00E+00	0.00E+00	1.42E-16	0.00E+00

Title : U-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
U-238		
U-238	3.09E-03	3.09E-03
U-234	7.61E-10	7.61E-10
TH-230	4.01E-15	4.01E-15
RA-226	1.19E-15	1.19E-15
PB-210	5.14E-20	5.14E-20

Title : U-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238.bld

Evaluation Time: 10.0000000 years

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```

Assessment for Time: 3

Time =1.00E+01 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	U-238	1.450E+04
	U-234	4.111E-01
	TH-230	1.850E-05
	RA-226	2.669E-08
	PB-210	1.952E-09



Title : U-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238.bld

Evaluation Time: 10.0000000 years

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RESRAD-BUILDDose Tables

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---

Source Contributions to Receptor Doses

---

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[mrem]

	Source	Total
	1	
Receptor 1	3.09E-03	3.09E-03
Total	3.09E-03	3.09E-03

Title : U-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238.bld

Evaluation Time: 10.0000000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	3.09E-03	0.00E+00	0.00E+00	0.00E+00	4.39E-14	0.00E+00
Total	3.09E-03	0.00E+00	0.00E+00	0.00E+00	4.39E-14	0.00E+00

Title : U-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238.bld

Evaluation Time: 10.0000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
U-238		
U-238	3.09E-03	3.09E-03
U-234	5.33E-09	5.33E-09
TH-230	1.90E-13	1.90E-13
RA-226	3.67E-13	3.67E-13
PB-210	9.60E-17	9.60E-17

Title : U-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238.bld

Evaluation Time: 100.000008 years

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```

Assessment for Time: 4

Time =1.00E+02 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	U-238	1.450E+04
	U-234	4.110E+00
	TH-230	1.849E-03
	RA-226	2.642E-05
	PB-210	1.231E-05

Title : U-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238.bld

Evaluation Time: 100.000008 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	3.09E-03	3.09E-03
Total	3.09E-03	3.09E-03

Title : U-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238.bld

Evaluation Time: 100.000008 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	3.09E-03	0.00E+00	0.00E+00	0.00E+00	3.81E-11	0.00E+00
Total	3.09E-03	0.00E+00	0.00E+00	0.00E+00	3.81E-11	0.00E+00

Title : U-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238.bld

Evaluation Time: 100.000008 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
U-238		
U-238	3.09E-03	3.09E-03
U-234	5.10E-08	5.10E-08
TH-230	1.74E-11	1.74E-11
RA-226	3.18E-10	3.18E-10
PB-210	5.06E-13	5.06E-13

Title : U-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238.bld

Evaluation Time: 1000.00000 years

```
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=====
Assessment for Time: 5
Time =1.00E+03 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	U-238	1.450E+04
	U-234	4.105E+01
	TH-230	1.843E-01
	RA-226	2.399E-02
	PB-210	2.188E-02



Title : U-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238.bld

Evaluation Time: 1000.00000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	3.09E-03	3.09E-03
Total	3.09E-03	3.09E-03

Title : U-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238.bld

Evaluation Time: 1000.00000 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	3.09E-03	0.00E+00	0.00E+00	0.00E+00	3.41E-08	0.00E+00
Total	3.09E-03	0.00E+00	0.00E+00	0.00E+00	3.41E-08	0.00E+00

Title : U-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238.bld

Evaluation Time: 1000.00000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
U-238		
U-238	3.09E-03	3.09E-03
U-234	5.07E-07	5.07E-07
TH-230	1.71E-09	1.71E-09
RA-226	2.84E-07	2.84E-07
PB-210	8.86E-10	8.86E-10

Title : U-238

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238.bld

Full Summary

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=====
RESRAD-BUILD Dose (Time) Tables
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```

Receptor Dose Received for the Exposure Duration

(mrem)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.42E+01	3.09E-03	3.09E-03	3.09E-03	3.09E-03

Receptor Dose/Yr Averaged Over Exposure Duration

(mrem/yr)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.43E+01	3.09E-03	3.09E-03	3.09E-03	3.09E-03

Title : Np-237

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237.bld

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Title : Np-237

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237.bld

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RESRAD-BUILD Input Parameters
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```

```

Number of Sources : 1
Number of Receptors: 1
Total Time : 3.650000E+02 days
Fraction Inside : 5.000000E-01
    
```

```

===== Receptor Information =====
    
```

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	6.000	6.000	1.000	1.000	1.80E+01	1.00E-04

```

===== Receptor-Source Shielding Relationship =====
    
```

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

==== Building Information ====

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m]	Area [m2]	Air Exchanges [m3/hr]
		*****
		* * *
		* * *
		* * *
		* * * <=Q01: 7.20E+01
H1: 2.500		* Room 1 * Q10 : 7.20E+01
		* LAMBDA: 8.00E-01 * * *
Area 36.000		* * *
		*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : Np-237

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237.bld

==== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00[m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::

Nuclide Concentration Dose Conversion Factor (Library: FGR 13 Morbidity)

	[dpm/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity)		
		Ingestion [mrem/dpm]	Inhalation [mrem/dpm]	Submersion [mrem/yr/ (dpm/m3)]
NP-237	6.400E+03	2.000E-03	2.432E-01	5.450E-04
U-233	0.000E+00	1.302E-04	6.081E-02	8.604E-07
TH-229	0.000E+00	1.815E-03	9.730E-01	7.748E-04



Title : Np-237

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237.bld

Evaluation Time: 0.00000000E+00 years

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Assessment for Time: 1  
Time =0.00E+00 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	NP-237	6.400E+03
	U-233	0.000E+00
	TH-229	0.000E+00

Title : Np-237

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237.bld

Evaluation Time: 0.00000000E+00 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

---

---

[mrem]

	Source	Total
	1	
Receptor 1	1.46E+01	1.46E+01
Total	1.46E+01	1.46E+01

Title : Np-237

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237.bld

Evaluation Time: 0.00000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	7.22E-03	5.38E-04	4.88E-06	1.43E+01	0.00E+00	3.13E-01
Total	7.22E-03	5.38E-04	4.88E-06	1.43E+01	0.00E+00	3.13E-01

Title : Np-237

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237.bld

Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
NP-237		
NP-237	1.46E+01	1.46E+01
U-233	7.69E-06	7.69E-06
TH-229	3.78E-09	3.78E-09

Title : Np-237

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237.bld

Evaluation Time: 1.00000000 years

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Assessment for Time: 2

Time =1.00E+00 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	NP-237	3.200E+03
	U-233	1.399E-02
	TH-229	6.607E-07

Title : Np-237

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237.bld

Evaluation Time: 1.00000000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	4.81E-03	4.81E-03
Total	4.81E-03	4.81E-03

Title : Np-237

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	4.81E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	4.81E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Np-237

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
NP-237		
NP-237	4.81E-03	4.81E-03
U-233	2.00E-10	2.00E-10
TH-229	3.30E-12	3.30E-12



Title : Np-237

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237.bld

Evaluation Time: 10.0000000 years

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```

Assessment for Time: 3  
Time =1.00E+01 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	NP-237	3.200E+03
	U-233	1.399E-01
	TH-229	6.605E-05

Title : Np-237

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237.bld

Evaluation Time: 10.0000000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	4.81E-03	4.81E-03
Total	4.81E-03	4.81E-03

Title : Np-237

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237.bld

Evaluation Time: 10.0000000 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	4.81E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	4.81E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Np-237

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237.bld

Evaluation Time: 10.0000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
NP-237		
NP-237	4.81E-03	4.81E-03
U-233	1.40E-09	1.40E-09
TH-229	1.56E-10	1.56E-10

Title : Np-237

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237.bld

Evaluation Time: 100.000008 years

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Assessment for Time: 4
Time =1.00E+02 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	NP-237	3.200E+03
	U-233	1.399E+00
	TH-229	6.586E-03

Title : Np-237

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237.bld

Evaluation Time: 100.000008 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	4.81E-03	4.81E-03
Total	4.81E-03	4.81E-03

Title : Np-237

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237.bld

Evaluation Time: 100.000008 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	4.81E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	4.81E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Np-237

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237.bld

Evaluation Time: 100.000008 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
NP-237		
NP-237	4.81E-03	4.81E-03
U-233	1.34E-08	1.34E-08
TH-229	1.42E-08	1.42E-08



Title : Np-237

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237.bld

Evaluation Time: 1000.00000 years

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```

Assessment for Time: 5

Time =1.00E+03 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	NP-237	3.199E+03
	U-233	1.396E+01
	TH-229	6.394E-01

Title : Np-237

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237.bld

Evaluation Time: 1000.00000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	4.81E-03	4.81E-03
Total	4.81E-03	4.81E-03

Title : Np-237

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237.bld

Evaluation Time: 1000.00000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	4.81E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	4.81E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Np-237

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237.bld

Evaluation Time: 1000.00000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
NP-237		
NP-237	4.81E-03	4.81E-03
U-233	1.33E-07	1.33E-07
TH-229	1.37E-06	1.37E-06

Title : Np-237

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237.bld

Full Summary

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RESRAD-BUILD Dose (Time) Tables

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=====

Receptor Dose Received for the Exposure Duration

=====

(mrem)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.46E+01	4.81E-03	4.81E-03	4.81E-03	4.81E-03

Receptor Dose/Yr Averaged Over Exposure Duration

=====

(mrem/yr)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.46E+01	4.81E-03	4.81E-03	4.81E-03	4.81E-03

Title : U-235

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235.bld

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Dose by Pathway Detail.....	11
Dose by Nuclide Detail.....	12
For time = 1.00E+01 yr	
Time Specific Parameters.....	13
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Dose by Pathway Detail.....	15
Dose by Nuclide Detail.....	16
For time = 1.00E+02 yr	
Time Specific Parameters.....	17
Receptor-Source Dose Summary.....	18
Dose by Pathway Detail.....	19
Dose by Nuclide Detail.....	20
For time = 1.00E+03 yr	
Time Specific Parameters.....	21
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Title : U-235

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235.bld

```

=====
=====
=====
RESRAD-BUILD Input Parameters
=====
=====
=====
    
```

```

Number of Sources : 1
Number of Receptors: 1
Total Time : 3.650000E+02 days
Fraction Inside : 5.000000E-01
    
```

```

===== Receptor Information =====
    
```

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	6.000	6.000	1.000	1.000	1.80E+01	1.00E-04

```

===== Receptor-Source Shielding Relationship =====
    
```

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

==== Building Information ====

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m]	Area [m2]	Air Exchanges [m3/hr]
		*****
		* * *
		* * *
		* * *
		* * * <=Q01: 7.20E+01
H1: 2.500		* Room 1 * Q10 : 7.20E+01
		* LAMBDA: 8.00E-01 * * *
Area 36.000		* * *
		*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]



Title : U-235

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235.bld

==== Source Information ====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00[m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::

Nuclide Concentration Dose Conversion Factor (Library: FGR 13 Morbidity)

	[dpm/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity)		
		Ingestion [mrem/dpm]	Inhalation [mrem/dpm]	Submersion [mrem/yr/ (dpm/m3)]
U-235	2.800E+04	1.203E-04	5.541E-02	4.068E-04
PA-231	0.000E+00	4.775E-03	5.766E-01	9.054E-05
AC-227	0.000E+00	6.667E-03	3.027E+00	9.730E-04

Title : U-235

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235.bld

Evaluation Time: 0.00000000E+00 years

```
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=====
=====
```

Assessment for Time: 1

Time =0.00E+00 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	U-235	2.800E+04
	PA-231	0.000E+00
	AC-227	0.000E+00

Title : U-235

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235.bld

Evaluation Time: 0.00000000E+00 years

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=====  
RESRAD-BUILDDose Tables  
=====  
=====  
=====

Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	1.43E+01	1.43E+01
Total	1.43E+01	1.43E+01

Title : U-235

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235.bld

Evaluation Time: 0.00000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	2.32E-02	1.73E-03	1.59E-05	1.42E+01	0.00E+00	8.25E-02
Total	2.32E-02	1.73E-03	1.59E-05	1.42E+01	0.00E+00	8.25E-02

Title : U-235

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235.bld

Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
U-235		
U-235	1.43E+01	1.43E+01
PA-231	1.57E-03	1.57E-03
AC-227	8.05E-05	8.05E-05

Title : U-235

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235.bld

Evaluation Time: 1.00000000 years

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=====
Assessment for Time: 2
Time =1.00E+00 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	U-235	1.400E+04
	PA-231	2.962E-01
	AC-227	4.665E-03

Title : U-235

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235.bld

Evaluation Time: 1.00000000 years

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RESRAD-BUILDDose Tables

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=====

Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	1.55E-02	1.55E-02
Total	1.55E-02	1.55E-02

Title : U-235

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	1.55E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	1.55E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00



Title : U-235

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
U-235		
U-235	1.55E-02	1.55E-02
PA-231	1.36E-07	1.36E-07
AC-227	2.67E-08	2.67E-08

Title : U-235

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235.bld

Evaluation Time: 10.0000000 years

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```

Assessment for Time: 3

Time =1.00E+01 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	U-235	1.400E+04
	PA-231	2.962E+00
	AC-227	4.252E-01

Title : U-235

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235.bld

Evaluation Time: 10.0000000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	1.55E-02	1.55E-02
Total	1.55E-02	1.55E-02

Title : U-235

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235.bld

Evaluation Time: 10.0000000 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	1.55E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	1.55E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : U-235

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235.bld

Evaluation Time: 10.0000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
U-235		
U-235	1.55E-02	1.55E-02
PA-231	9.55E-07	9.55E-07
AC-227	1.15E-06	1.15E-06

Title : U-235

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235.bld

Evaluation Time: 100.000008 years

```
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=====
=====
=====
```

Assessment for Time: 4

Time =1.00E+02 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	U-235	1.400E+04
	PA-231	2.959E+01
	AC-227	2.068E+01

Title : U-235

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235.bld

Evaluation Time: 100.000008 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	1.55E-02	1.55E-02
Total	1.55E-02	1.55E-02

Title : U-235

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235.bld

Evaluation Time: 100.000008 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.55E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	1.55E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00



Title : U-235

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235.bld

Evaluation Time: 100.000008 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
U-235		
U-235	1.55E-02	1.55E-02
PA-231	9.13E-06	9.13E-06
AC-227	5.14E-05	5.14E-05

Title : U-235

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235.bld

Evaluation Time: 1000.00000 years

```
=====
=====
=====
Assessment for Time: 5
Time =1.00E+03 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	U-235	1.400E+04
	PA-231	2.931E+02
	AC-227	2.840E+02

Title : U-235

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235.bld

Evaluation Time: 1000.00000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

---

---

[mrem]

	Source	Total
	1	
Receptor 1	1.63E-02	1.63E-02
Total	1.63E-02	1.63E-02

Title : U-235

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235.bld

Evaluation Time: 1000.00000 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	1.63E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	1.63E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : U-235

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235.bld

Evaluation Time: 1000.00000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
U-235		
U-235	1.55E-02	1.55E-02
PA-231	9.01E-05	9.01E-05
AC-227	7.01E-04	7.01E-04

Title : U-235

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235.bld

Full Summary

```

=====
=====
=====
RESRAD-BUILD Dose (Time) Tables
=====
=====
=====
    
```

Receptor Dose Received for the Exposure Duration

=====

(mrem)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.43E+01	1.55E-02	1.55E-02	1.55E-02	1.63E-02

Receptor Dose/Yr Averaged Over Exposure Duration

=====

(mrem/yr)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.44E+01	1.55E-02	1.55E-02	1.55E-02	1.63E-02

Title : Th-232

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232.bld

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Full Summary.....	25

Title : Th-232

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232.bld

```

=====
=====
=====
RESRAD-BUILD Input Parameters
=====
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```

```

Number of Sources : 1
Number of Receptors: 1
Total Time : 3.650000E+02 days
Fraction Inside : 5.000000E-01
    
```

```

===== Receptor Information =====
    
```

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	6.000	6.000	1.000	1.000	1.80E+01	1.00E-04

```

===== Receptor-Source Shielding Relationship =====
    
```

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete



==== Building Information ====

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m]	Area [m2]	Air Exchanges [m3/hr]
		*****
		* * *
		* * *
		* * *
		* * * <=Q01: 2.00E+02
H1: 2.500		* Room 1 * Q10 : 2.00E+02
		* LAMBDA: 8.00E-01 * * *
Area 100.000		* * *
		*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : Th-232

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232.bld

==== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00[m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Radon Release Fraction: 1.000E-01

Contamination::

Nuclide Concentration Dose Conversion Factor (Library: FGR 13 Morbidity)

	Nuclide Concentration [dpm/m2]	Ingestion [mrem/dpm]	Inhalation [mrem/dpm]	Submersion [mrem/yr/ (dpm/m3)]
TH-232	6.100E+03	1.230E-03	7.387E-01	4.595E-07
TH-228	0.000E+00	3.640E-04	1.554E-01	4.239E-03
RA-228	0.000E+00	6.486E-04	2.288E-03	2.518E-03

Title : Th-232

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232.bld

Evaluation Time: 0.00000000E+00 years

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=====
```

Assessment for Time: 1  
Time =0.00E+00 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	TH-232	6.100E+03
	TH-228	0.000E+00
	RA-228	0.000E+00

Title : Th-232

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232.bld

Evaluation Time: 0.00000000E+00 years

---

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RESRAD-BUILDDose Tables

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---

Source Contributions to Receptor Doses

---

---

[mrem]

	Source	Total
	1	
Receptor 1	1.50E+01	1.50E+01
Total	1.50E+01	1.50E+01

Title : Th-232

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232.bld

Evaluation Time: 0.00000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	1.64E-03	5.71E-05	4.45E-07	1.49E+01	1.83E-04	6.79E-02
Total	1.64E-03	5.71E-05	4.45E-07	1.49E+01	1.83E-04	6.79E-02

Title : Th-232

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232.bld

Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
TH-232		
TH-232	1.50E+01	1.50E+01
TH-228	1.43E-02	1.43E-02
RA-228	5.47E-03	5.47E-03

Title : Th-232

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232.bld

Evaluation Time: 1.00000000 years

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=====
```

Assessment for Time: 2

Time =1.00E+00 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	TH-232	3.050E+03
	TH-228	5.686E+01
	RA-228	3.464E+02

Title : Th-232

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232.bld

Evaluation Time: 1.00000000 years

=====

=====

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=====

RESRAD-BUILDDose Tables

=====

=====

=====

Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	4.93E-03	4.93E-03
Total	4.93E-03	4.93E-03



Title : Th-232

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	4.04E-03	0.00E+00	0.00E+00	0.00E+00	8.95E-04	0.00E+00
Total	4.04E-03	0.00E+00	0.00E+00	0.00E+00	8.95E-04	0.00E+00

Title : Th-232

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
TH-232		
TH-232	2.49E-05	2.49E-05
TH-228	1.94E-03	1.94E-03
RA-228	2.97E-03	2.97E-03

Title : Th-232

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232.bld

Evaluation Time: 10.0000000 years

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```

Assessment for Time: 3

Time =1.00E+01 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	TH-232	3.050E+03
	TH-228	1.721E+03
	RA-228	2.136E+03

Title : Th-232

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232.bld

Evaluation Time: 10.0000000 years

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=====  
RESRAD-BUILDDose Tables  
=====  
=====  
=====

Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	4.18E-02	4.18E-02
Total	4.18E-02	4.18E-02

Title : Th-232

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232.bld

Evaluation Time: 10.0000000 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	2.85E-02	0.00E+00	0.00E+00	0.00E+00	1.33E-02	0.00E+00
Total	2.85E-02	0.00E+00	0.00E+00	0.00E+00	1.33E-02	0.00E+00

Title : Th-232

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232.bld

Evaluation Time: 10.0000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
TH-232		
TH-232	2.49E-05	2.49E-05
TH-228	2.88E-02	2.88E-02
RA-228	1.29E-02	1.29E-02

Title : Th-232

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232.bld

Evaluation Time: 100.000008 years

```
=====
=====
=====
Assessment for Time: 4
Time =1.00E+02 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	TH-232	3.050E+03
	TH-228	3.050E+03
	RA-228	3.050E+03

Title : Th-232

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232.bld

Evaluation Time: 100.000008 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	6.70E-02	6.70E-02
Total	6.70E-02	6.70E-02



Title : Th-232

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232.bld

Evaluation Time: 100.000008 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	4.45E-02	0.00E+00	0.00E+00	0.00E+00	2.26E-02	0.00E+00
Total	4.45E-02	0.00E+00	0.00E+00	0.00E+00	2.26E-02	0.00E+00

Title : Th-232

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232.bld

Evaluation Time: 100.000008 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
TH-232		
TH-232	2.49E-05	2.49E-05
TH-228	4.90E-02	4.90E-02
RA-228	1.80E-02	1.80E-02

Title : Th-232

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232.bld

Evaluation Time: 1000.00000 years

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```

Assessment for Time: 5

Time =1.00E+03 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	TH-232	3.050E+03
	TH-228	3.050E+03
	RA-228	3.050E+03

Title : Th-232

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232.bld

Evaluation Time: 1000.00000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	6.70E-02	6.70E-02
Total	6.70E-02	6.70E-02

Title : Th-232

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232.bld

Evaluation Time: 1000.00000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	4.45E-02	0.00E+00	0.00E+00	0.00E+00	2.26E-02	0.00E+00
Total	4.45E-02	0.00E+00	0.00E+00	0.00E+00	2.26E-02	0.00E+00

Title : Th-232

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232.bld

Evaluation Time: 1000.00000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
TH-232		
TH-232	2.49E-05	2.49E-05
TH-228	4.90E-02	4.90E-02
RA-228	1.80E-02	1.80E-02

Title : Th-232

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232.bld

Full Summary

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RESRAD-BUILD Dose (Time) Tables

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Receptor Dose Received for the Exposure Duration

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(mrem)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.50E+01	4.93E-03	4.18E-02	6.70E-02	6.70E-02

Receptor Dose/Yr Averaged Over Exposure Duration

=====

(mrem/yr)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.50E+01	4.94E-03	4.18E-02	6.71E-02	6.71E-02

Title : H-3

Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3.bld

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For time = 1.00E+01 yr	
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Dose by Nuclide Detail.....	16
For time = 1.00E+02 yr	
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Dose by Nuclide Detail.....	20
For time = 1.00E+03 yr	
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Dose by Nuclide Detail.....	24
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Title : H-3

Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3.bld

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RESRAD-BUILD Input Parameters
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Number of Sources : 1
Number of Receptors: 1
Total Time : 3.650000E+02 days
Fraction Inside : 5.000000E-01
    
```

```

===== Receptor Information =====
    
```

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion (Dust) [m2/hr]
1	1	6.000	6.000	1.000	1.000	1.80E+01	1.00E-04

```

===== Receptor-Source Shielding Relationship =====
    
```

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

==== Building Information =====

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m]	Area [m2]	Air Exchanges [m3/hr]
		*****
		*
		*
		*
H1: 2.500		<=Q01: 7.20E+01
		* Room 1 * Q10 : 7.20E+01
		* LAMBDA: 8.00E-01 *
Area 36.000		*
		*
		*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : H-3

Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3.bld

==== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00[m]  
 Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z  
 Pathway ::  
     Direct Ingestion Rate: 0.000E+00 [1/hr]  
     Fraction released to air: 1.000E-01  
     Removable fraction: 5.000E-01  
     Time to Remove: 3.650E+02 [day]

Contamination::

Nuclide	Concentration [dpm/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity)		
		Ingestion [mrem/dpm]	Inhalation [mrem/dpm]	Submersion [mrem/yr/ (dpm/m3)]
H-3	1.400E+10	2.883E-08	2.883E-08	0.000E+00

Title : H-3

Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3.bld

Evaluation Time: 0.00000000E+00 years

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Assessment for Time: 1  
Time =0.00E+00 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]  
Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z  
Pathway ::  
Direct Ingestion Rate: 0.000E+00 [1/hr]  
Fraction released to air: 1.000E-01  
Removable fraction: 5.000E-01  
Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	H-3	1.400E+10

Title : H-3

Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3.bld

Evaluation Time: 0.00000000E+00 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	1.41E+01	1.41E+01
Total	1.41E+01	1.41E+01

Title : H-3  
Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3.bld  
Evaluation Time: 0.00000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	0.00E+00	0.00E+00	0.00E+00	5.08E+00	0.00E+00	9.00E+00
Total	0.00E+00	0.00E+00	0.00E+00	5.08E+00	0.00E+00	9.00E+00

Title : H-3  
Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3.bld  
Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
H-3	1	
H-3	1.41E+01	1.41E+01

Title : H-3

Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3.bld

Evaluation Time: 1.00000000 years

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Assessment for Time: 2  
Time =1.00E+00 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]  
Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z  
Pathway ::  
Direct Ingestion Rate: 0.000E+00 [1/hr]  
Fraction released to air: 1.000E-01  
Removable fraction: 0.000E+00  
Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	H-3	6.618E+09



Title : H-3

Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3.bld

Evaluation Time: 1.00000000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	0.00E+00	0.00E+00
Total	0.00E+00	0.00E+00

Title : H-3  
Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3.bld  
Evaluation Time: 1.00000000 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : H-3  
Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3.bld  
Evaluation Time: 1.00000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
H-3	1	
H-3	0.00E+00	0.00E+00

Title : H-3

Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3.bld

Evaluation Time: 10.0000000 years

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Assessment for Time: 3
Time =1.00E+01 yr
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===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]  
Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z  
Pathway ::  
Direct Ingestion Rate: 0.000E+00 [1/hr]  
Fraction released to air: 1.000E-01  
Removable fraction: 0.000E+00  
Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
	H-3	3.993E+09 [dpm/m2]

Title : H-3  
Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3.bld  
Evaluation Time: 10.0000000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	0.00E+00	0.00E+00
Total	0.00E+00	0.00E+00

Title : H-3  
Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3.bld  
Evaluation Time: 10.0000000 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : H-3  
Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3.bld  
Evaluation Time: 10.0000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
H-3	1	
H-3	0.00E+00	0.00E+00

Title : H-3

Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3.bld

Evaluation Time: 100.000008 years

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Assessment for Time: 4  
Time =1.00E+02 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]  
Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z  
Pathway ::  
Direct Ingestion Rate: 0.000E+00 [1/hr]  
Fraction released to air: 1.000E-01  
Removable fraction: 0.000E+00  
Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
	H-3	2.556E+07 [dpm/m2]



Title : H-3  
Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3.bld  
Evaluation Time: 100.000008 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	0.00E+00	0.00E+00
Total	0.00E+00	0.00E+00

Title : H-3  
Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3.bld  
Evaluation Time: 100.000008 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : H-3  
Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3.bld  
Evaluation Time: 100.000008 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
H-3	1	
H-3	0.00E+00	0.00E+00

Title : H-3

Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3.bld

Evaluation Time: 1000.00000 years

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Assessment for Time: 5  
Time =1.00E+03 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]  
Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z  
Pathway ::  
Direct Ingestion Rate: 0.000E+00 [1/hr]  
Fraction released to air: 1.000E-01  
Removable fraction: 0.000E+00  
Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	H-3	2.953E-15

Title : H-3

Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3.bld

Evaluation Time: 1000.00000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	0.00E+00	0.00E+00
Total	0.00E+00	0.00E+00

Title : H-3  
Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3.bld  
Evaluation Time: 1000.00000 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : H-3  
Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3.bld  
Evaluation Time: 1000.00000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
H-3	1	
H-3	0.00E+00	0.00E+00

Title : H-3

Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3.bld

Full Summary

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RESRAD-BUILD Dose (Time) Tables

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Receptor Dose Received for the Exposure Duration

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(mrem)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.41E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Receptor Dose/Yr Averaged Over Exposure Duration

=====

(mrem/yr)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.41E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00



Title : Ra-226

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226.bld

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For time = 1.00E+00 yr	
Time Specific Parameters.....	9
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Dose by Pathway Detail.....	11
Dose by Nuclide Detail.....	12
For time = 1.00E+01 yr	
Time Specific Parameters.....	13
Receptor-Source Dose Summary.....	14
Dose by Pathway Detail.....	15
Dose by Nuclide Detail.....	16
For time = 1.00E+02 yr	
Time Specific Parameters.....	17
Receptor-Source Dose Summary.....	18
Dose by Pathway Detail.....	19
Dose by Nuclide Detail.....	20
For time = 1.00E+03 yr	
Time Specific Parameters.....	21
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Full Summary.....	25

Title : Ra-226

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226.bld

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RESRAD-BUILD Input Parameters
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```

```

Number of Sources : 1
Number of Receptors: 1
Total Time : 3.650000E+02 days
Fraction Inside : 5.000000E-01
    
```

```

===== Receptor Information =====
    
```

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	6.000	6.000	1.000	1.000	1.80E+01	1.00E-04

```

===== Receptor-Source Shielding Relationship =====
    
```

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

==== Building Information ====

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m]	Area [m2]	Air Exchanges [m3/hr]
		*****
		* * *
		* * *
		* * *
		* * * <=Q01: 7.20E+01
H1: 2.500		* Room 1 * Q10 : 7.20E+01
		* LAMBDA: 8.00E-01 * * *
Area 36.000		* * *
		*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : Ra-226

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226.bld

==== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00[m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Radon Release Fraction: 1.000E-01

Contamination::

Nuclide Concentration Dose Conversion Factor (Library: FGR 13 Morbidity)

	[dpm/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity)		
		Ingestion [mrem/dpm]	Inhalation [mrem/dpm]	Submersion [mrem/yr/ (dpm/m3)]
RA-226	2.400E+05	5.991E-04	3.874E-03	4.685E-03
PB-210	0.000E+00	2.419E-03	6.216E-03	4.730E-06

Title : Ra-226

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226.bld

Evaluation Time: 0.00000000E+00 years

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Assessment for Time: 1

Time =0.00E+00 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	RA-226	2.400E+05
	PB-210	0.000E+00

Title : Ra-226

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226.bld

Evaluation Time: 0.00000000E+00 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	1.47E+01	1.47E+01
Total	1.47E+01	1.47E+01

Title : Ra-226

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226.bld

Evaluation Time: 0.00000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	1.88E+00	1.40E-01	1.57E-03	8.73E+00	2.55E-01	3.72E+00
Total	1.88E+00	1.40E-01	1.57E-03	8.73E+00	2.55E-01	3.72E+00

Title : Ra-226

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226.bld

Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
RA-226		
RA-226	1.43E+01	1.43E+01
PB-210	4.05E-01	4.05E-01



Title : Ra-226

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226.bld

Evaluation Time: 1.00000000 years

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```

Assessment for Time: 2

Time =1.00E+00 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	RA-226	1.199E+05
	PB-210	3.672E+03

Title : Ra-226

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226.bld

Evaluation Time: 1.00000000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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---

[mrem]

	Source	Total
	1	
Receptor 1	1.42E+00	1.42E+00
Total	1.42E+00	1.42E+00

Title : Ra-226

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.25E+00	0.00E+00	0.00E+00	0.00E+00	1.70E-01	0.00E+00
Total	1.25E+00	0.00E+00	0.00E+00	0.00E+00	1.70E-01	0.00E+00

Title : Ra-226

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
RA-226		
RA-226	1.42E+00	1.42E+00
PB-210	2.21E-04	2.21E-04

Title : Ra-226

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226.bld

Evaluation Time: 10.0000000 years

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=====
=====
```

Assessment for Time: 3  
Time =1.00E+01 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	RA-226	1.195E+05
	PB-210	3.199E+04

Title : Ra-226

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226.bld

Evaluation Time: 10.0000000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	1.42E+00	1.42E+00
Total	1.42E+00	1.42E+00

Title : Ra-226

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226.bld

Evaluation Time: 10.0000000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.25E+00	0.00E+00	0.00E+00	0.00E+00	1.69E-01	0.00E+00
Total	1.25E+00	0.00E+00	0.00E+00	0.00E+00	1.69E-01	0.00E+00

Title : Ra-226

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226.bld

Evaluation Time: 10.0000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
RA-226		
RA-226	1.41E+00	1.41E+00
PB-210	1.35E-03	1.35E-03



Title : Ra-226

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226.bld

Evaluation Time: 100.000008 years

```
=====
=====
=====
Assessment for Time: 4
Time =1.00E+02 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	RA-226	1.149E+05
	PB-210	1.111E+05

Title : Ra-226

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226.bld

Evaluation Time: 100.000008 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	1.36E+00	1.36E+00
Total	1.36E+00	1.36E+00

Title : Ra-226

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226.bld

Evaluation Time: 100.000008 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	1.20E+00	0.00E+00	0.00E+00	0.00E+00	1.63E-01	0.00E+00
Total	1.20E+00	0.00E+00	0.00E+00	0.00E+00	1.63E-01	0.00E+00

Title : Ra-226

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226.bld

Evaluation Time: 100.000008 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
RA-226		
RA-226	1.36E+00	1.36E+00
PB-210	4.49E-03	4.49E-03

Title : Ra-226

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226.bld

Evaluation Time: 1000.00000 years

```
=====
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=====
Assessment for Time: 5
Time =1.00E+03 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	RA-226	7.781E+04
	PB-210	7.891E+04

Title : Ra-226

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226.bld

Evaluation Time: 1000.00000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	9.24E-01	9.24E-01
Total	9.24E-01	9.24E-01

Title : Ra-226

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226.bld

Evaluation Time: 1000.00000 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	8.14E-01	0.00E+00	0.00E+00	0.00E+00	1.10E-01	0.00E+00
Total	8.14E-01	0.00E+00	0.00E+00	0.00E+00	1.10E-01	0.00E+00

Title : Ra-226

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226.bld

Evaluation Time: 1000.00000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
RA-226		
RA-226	9.21E-01	9.21E-01
PB-210	3.19E-03	3.19E-03



Title : Ra-226

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226.bld

Full Summary

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RESRAD-BUILD Dose (Time) Tables

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=====

Receptor Dose Received for the Exposure Duration

=====

(mrem)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.47E+01	1.42E+00	1.42E+00	1.36E+00	9.24E-01

Receptor Dose/Yr Averaged Over Exposure Duration

=====

(mrem/yr)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.47E+01	1.42E+00	1.42E+00	1.37E+00	9.25E-01

Title : Sr-90

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90.bld

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For time = 1.00E+00 yr	
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Dose by Nuclide Detail.....	12
For time = 1.00E+01 yr	
Time Specific Parameters.....	13
Receptor-Source Dose Summary.....	14
Dose by Pathway Detail.....	15
Dose by Nuclide Detail.....	16
For time = 1.00E+02 yr	
Time Specific Parameters.....	17
Receptor-Source Dose Summary.....	18
Dose by Pathway Detail.....	19
Dose by Nuclide Detail.....	20
For time = 1.00E+03 yr	
Time Specific Parameters.....	21
Receptor-Source Dose Summary.....	22
Dose by Pathway Detail.....	23
Dose by Nuclide Detail.....	24
Full Summary.....	25

Title : Sr-90

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90.bld

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=====
RESRAD-BUILD Input Parameters
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=====
=====
    
```

```

Number of Sources : 1
Number of Receptors: 1
Total Time : 3.650000E+02 days
Fraction Inside : 5.000000E-01
    
```

```

===== Receptor Information =====
    
```

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	6.000	6.000	1.000	1.000	1.80E+01	1.00E-04

```

===== Receptor-Source Shielding Relationship =====
    
```

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

Title : Sr-90

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90.bld

==== Building Information ====

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m]	Area [m2]	Air Exchanges [m3/hr]
		*****
		* * *
		* * *
		* * *
		* * * <=Q01: 7.20E+01
H1: 2.500		* Room 1 * Q10 : 7.20E+01
		* LAMBDA: 8.00E-01 * * *
Area 36.000		* * *
		*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : Sr-90

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90.bld

==== Source Information ====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00[m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::

Nuclide Concentration Dose Conversion Factor (Library: FGR 13 Morbidity)

	[dpm/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity)		
		Ingestion [mrem/dpm]	Inhalation [mrem/dpm]	Submersion [mrem/yr/ (dpm/m3)]
SR-90	2.000E+06	6.892E-05	5.901E-04	1.041E-05

Title : Sr-90

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90.bld

Evaluation Time: 0.00000000E+00 years

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=====
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=====
Assessment for Time: 1
Time =0.00E+00 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	SR-90	2.000E+06

Title : Sr-90

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90.bld

Evaluation Time: 0.00000000E+00 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	1.37E+01	1.37E+01
Total	1.37E+01	1.37E+01

Title : Sr-90

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90.bld

Evaluation Time: 0.00000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	5.26E-02	3.81E-03	2.80E-05	1.04E+01	0.00E+00	3.24E+00
Total	5.26E-02	3.81E-03	2.80E-05	1.04E+01	0.00E+00	3.24E+00



Title : Sr-90

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90.bld

Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
SR-90		
SR-90	1.37E+01	1.37E+01

Title : Sr-90

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90.bld

Evaluation Time: 1.00000000 years

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Assessment for Time: 2

Time =1.00E+00 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	SR-90	9.765E+05

Title : Sr-90

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90.bld

Evaluation Time: 1.00000000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	3.42E-02	3.42E-02
Total	3.42E-02	3.42E-02

Title : Sr-90

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	3.42E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	3.42E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Sr-90

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
SR-90		
SR-90	3.42E-02	3.42E-02

Title : Sr-90

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90.bld

Evaluation Time: 10.0000000 years

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```

Assessment for Time: 3

Time =1.00E+01 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	SR-90	7.882E+05

Title : Sr-90

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90.bld

Evaluation Time: 10.0000000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	2.76E-02	2.76E-02
Total	2.76E-02	2.76E-02

Title : Sr-90

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90.bld

Evaluation Time: 10.0000000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	2.76E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	2.76E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00



Title : Sr-90

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90.bld

Evaluation Time: 10.0000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
SR-90		
SR-90	2.76E-02	2.76E-02

Title : Sr-90

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90.bld

Evaluation Time: 100.000008 years

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```

Assessment for Time: 4

Time =1.00E+02 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	SR-90	9.252E+04

Title : Sr-90

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90.bld

Evaluation Time: 100.000008 years

=====

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RESRAD-BUILDDose Tables

=====

=====

Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	3.24E-03	3.24E-03
Total	3.24E-03	3.24E-03

Title : Sr-90

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90.bld

Evaluation Time: 100.000008 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	3.24E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	3.24E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Sr-90

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90.bld

Evaluation Time: 100.000008 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
SR-90		
SR-90	3.24E-03	3.24E-03

Title : Sr-90

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90.bld

Evaluation Time: 1000.00000 years

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=====
```

Assessment for Time: 5

Time =1.00E+03 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	SR-90	4.597E-05

Title : Sr-90

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90.bld

Evaluation Time: 1000.00000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	1.61E-12	1.61E-12
Total	1.61E-12	1.61E-12

Title : Sr-90

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90.bld

Evaluation Time: 1000.00000 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	1.61E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	1.61E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00



Title : Sr-90

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90.bld

Evaluation Time: 1000.00000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
SR-90		
SR-90	1.61E-12	1.61E-12

Title : Sr-90

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90.bld

Full Summary

=====

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=====

RESRAD-BUILD Dose (Time) Tables

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=====

Receptor Dose Received for the Exposure Duration

=====

(mrem)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.37E+01	3.42E-02	2.76E-02	3.24E-03	1.61E-12

Receptor Dose/Yr Averaged Over Exposure Duration

=====

(mrem/yr)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.37E+01	3.42E-02	2.76E-02	3.24E-03	1.61E-12

Title : Cs-137

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137.bld

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Dose by Nuclide Detail.....	8
For time = 1.00E+00 yr	
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Receptor-Source Dose Summary.....	10
Dose by Pathway Detail.....	11
Dose by Nuclide Detail.....	12
For time = 1.00E+01 yr	
Time Specific Parameters.....	13
Receptor-Source Dose Summary.....	14
Dose by Pathway Detail.....	15
Dose by Nuclide Detail.....	16
For time = 1.00E+02 yr	
Time Specific Parameters.....	17
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Dose by Pathway Detail.....	19
Dose by Nuclide Detail.....	20
For time = 1.00E+03 yr	
Time Specific Parameters.....	21
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Full Summary.....	25

Title : Cs-137

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137.bld

```

=====
=====
=====
RESRAD-BUILD Input Parameters
=====
=====
=====
    
```

```

Number of Sources : 1
Number of Receptors: 1
Total Time : 3.650000E+02 days
Fraction Inside : 5.000000E-01
    
```

```

===== Receptor Information =====
    
```

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	6.000	6.000	1.000	1.000	1.80E+01	1.00E-04

```

===== Receptor-Source Shielding Relationship =====
    
```

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

==== Building Information =====

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m]	Area [m2]	Air Exchanges [m3/hr]
		*****
		* * *
		* * *
		* * *
		* * * <=Q01: 7.20E+01
H1: 2.500		* Room 1 * Q10 : 7.20E+01
		* LAMBDA: 8.00E-01 * * *
Area 36.000		* * *
		*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : Cs-137

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137.bld

==== Source Information ====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00[m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::

Nuclide Concentration Dose Conversion Factor (Library: FGR 13 Morbidity)

	[dpm/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity)		
		Ingestion [mrem/dpm]	Inhalation [mrem/dpm]	Submersion [mrem/yr/ (dpm/m3)]
CS-137	4.000E+06	2.252E-05	1.437E-05	1.437E-03

Title : Cs-137

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137.bld

Evaluation Time: 0.00000000E+00 years

```
=====
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=====
=====
```

Assessment for Time: 1

Time =0.00E+00 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	CS-137	4.000E+06

Title : Cs-137

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137.bld

Evaluation Time: 0.00000000E+00 years

---

---

---

RESRAD-BUILDDose Tables

---

---

---

Source Contributions to Receptor Doses

---

---

[mrem]

	Source	Total
	1	
Receptor 1	1.38E+01	1.38E+01
Total	1.38E+01	1.38E+01



Title : Cs-137

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137.bld

Evaluation Time: 0.00000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.04E+01	7.51E-01	7.75E-03	5.08E-01	0.00E+00	2.12E+00
Total	1.04E+01	7.51E-01	7.75E-03	5.08E-01	0.00E+00	2.12E+00

Title : Cs-137

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137.bld

Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
CS-137		
CS-137	1.38E+01	1.38E+01

Title : Cs-137

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137.bld

Evaluation Time: 1.00000000 years

```
=====
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=====
```

Assessment for Time: 2

Time =1.00E+00 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	CS-137	1.954E+06

Title : Cs-137

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137.bld

Evaluation Time: 1.00000000 years

---

---

---

RESRAD-BUILDDose Tables

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---

Source Contributions to Receptor Doses

---

---

[mrem]

	Source	Total
	1	
Receptor 1	6.75E+00	6.75E+00
Total	6.75E+00	6.75E+00

Title : Cs-137

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	6.75E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	6.75E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Cs-137

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
CS-137		
CS-137	6.75E+00	6.75E+00

Title : Cs-137

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137.bld

Evaluation Time: 10.0000000 years

```
=====
=====
=====
Assessment for Time: 3
Time =1.00E+01 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	CS-137	1.587E+06

Title : Cs-137

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137.bld

Evaluation Time: 10.0000000 years

---

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RESRAD-BUILDDose Tables

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---

Source Contributions to Receptor Doses

---

---

[mrem]

	Source	Total
	1	
Receptor 1	5.48E+00	5.48E+00
Total	5.48E+00	5.48E+00



Title : Cs-137

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137.bld

Evaluation Time: 10.0000000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	5.48E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	5.48E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Cs-137

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137.bld

Evaluation Time: 10.0000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
CS-137		
CS-137	5.48E+00	5.48E+00

Title : Cs-137

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137.bld

Evaluation Time: 100.000008 years

```
=====
=====
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=====
```

Assessment for Time: 4

Time =1.00E+02 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	CS-137	1.984E+05

Title : Cs-137

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137.bld

Evaluation Time: 100.000008 years

=====

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=====

RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	6.85E-01	6.85E-01
Total	6.85E-01	6.85E-01

Title : Cs-137

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137.bld

Evaluation Time: 100.000008 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	6.85E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	6.85E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Cs-137

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137.bld

Evaluation Time: 100.000008 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
CS-137		
CS-137	6.85E-01	6.85E-01

Title : Cs-137

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137.bld

Evaluation Time: 1000.00000 years

```
=====
=====
=====
Assessment for Time: 5
Time =1.00E+03 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	CS-137	1.848E-04

Title : Cs-137

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137.bld

Evaluation Time: 1000.00000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

---

---

[mrem]

	Source	Total
	1	
Receptor 1	6.38E-10	6.38E-10
Total	6.38E-10	6.38E-10



Title : Cs-137

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137.bld

Evaluation Time: 1000.00000 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	6.38E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	6.38E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Cs-137

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137.bld

Evaluation Time: 1000.00000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
CS-137		
CS-137	6.38E-10	6.38E-10

Title : Cs-137

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137.bld

Full Summary

```

=====
=====
=====
RESRAD-BUILD Dose (Time) Tables
=====
=====
=====
    
```

Receptor Dose Received for the Exposure Duration

(mrem)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.38E+01	6.75E+00	5.48E+00	6.85E-01	6.38E-10

Receptor Dose/Yr Averaged Over Exposure Duration

(mrem/yr)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.38E+01	6.75E+00	5.48E+00	6.85E-01	6.38E-10

Title : C-14

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14.bld

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Title : C-14

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14.bld

```

=====
=====
=====
RESRAD-BUILD Input Parameters
=====
=====
=====
    
```

```

Number of Sources : 1
Number of Receptors: 1
Total Time : 3.650000E+02 days
Fraction Inside : 5.000000E-01
    
```

```

===== Receptor Information =====
    
```

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	6.000	6.000	1.000	1.000	1.80E+01	1.00E-04

```

===== Receptor-Source Shielding Relationship =====
    
```

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

Title : C-14

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14.bld

==== Building Information ====

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m]	Area [m2]	Air Exchanges [m3/hr]
		*****
		* * *
		* * *
		* * *
		* * *
H1: 2.500		* Room 1 * <=Q01: 7.20E+01
		* LAMBDA: 8.00E-01 * Q10 : 7.20E+01
Area 36.000		* * *
		* * *
		*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : C-14

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14.bld

==== Source Information ====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00[m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::

Nuclide Concentration Dose Conversion Factor (Library: FGR 13 Morbidity)

		Ingestion	Inhalation	Submersion
	[dpm/m2]	[mrem/dpm]	[mrem/dpm]	[mrem/yr/ (dpm/m3)]
C-14	4.700E+08	9.414E-07	9.414E-07	1.180E-08

Title : C-14

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14.bld

Evaluation Time: 0.00000000E+00 years

```
=====
=====
=====
Assessment for Time: 1
Time =0.00E+00 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	C-14	4.700E+08



Title : C-14

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14.bld

Evaluation Time: 0.00000000E+00 years

=====

=====

=====

=====

RESRAD-BUILDDose Tables

=====

=====

=====

Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	1.49E+01	1.49E+01
Total	1.49E+01	1.49E+01

Title : C-14

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14.bld

Evaluation Time: 0.00000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	4.83E-02	3.60E-03	7.76E-06	4.06E+00	0.00E+00	1.08E+01
Total	4.83E-02	3.60E-03	7.76E-06	4.06E+00	0.00E+00	1.08E+01

Title : C-14

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14.bld

Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
C-14		
C-14	1.49E+01	1.49E+01

Title : C-14

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14.bld

Evaluation Time: 1.00000000 years

```
=====
=====
=====
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=====
=====
=====
=====
=====
```

Assessment for Time: 2

Time =1.00E+00 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	C-14	2.350E+08

Title : C-14

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14.bld

Evaluation Time: 1.00000000 years

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RESRAD-BUILDDose Tables

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---

Source Contributions to Receptor Doses

---

---

[mrem]

	Source	Total
	1	
Receptor 1	3.22E-02	3.22E-02
Total	3.22E-02	3.22E-02

Title : C-14

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	3.22E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	3.22E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : C-14

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
C-14		
C-14	3.22E-02	3.22E-02

Title : C-14

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14.bld

Evaluation Time: 10.0000000 years

```
=====
=====
=====
Assessment for Time: 3
Time =1.00E+01 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	C-14	2.347E+08



Title : C-14

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14.bld

Evaluation Time: 10.0000000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

---

---

[mrem]

	Source	Total
	1	
Receptor 1	3.22E-02	3.22E-02
Total	3.22E-02	3.22E-02

Title : C-14

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14.bld

Evaluation Time: 10.0000000 years

Pathway Detail of Doses

[mrem]

Source: 1						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	3.22E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	3.22E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : C-14

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14.bld

Evaluation Time: 10.0000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
C-14		
C-14	3.22E-02	3.22E-02

Title : C-14

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14.bld

Evaluation Time: 100.000008 years

```
=====
=====
=====
Assessment for Time: 4
Time =1.00E+02 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	C-14	2.322E+08

Title : C-14

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14.bld

Evaluation Time: 100.000008 years

=====

=====

=====

=====

RESRAD-BUILDDose Tables

=====

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=====

Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	3.18E-02	3.18E-02
Total	3.18E-02	3.18E-02

Title : C-14

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14.bld

Evaluation Time: 100.000008 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	3.18E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	3.18E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : C-14

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14.bld

Evaluation Time: 100.000008 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
C-14		
C-14	3.18E-02	3.18E-02

Title : C-14

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14.bld

Evaluation Time: 1000.00000 years

```
=====
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=====
=====
=====
```

Assessment for Time: 5

Time =1.00E+03 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	C-14	2.082E+08



Title : C-14

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14.bld

Evaluation Time: 1000.00000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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---

[mrem]

	Source	Total
	1	
Receptor 1	2.85E-02	2.85E-02
Total	2.85E-02	2.85E-02

Title : C-14

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14.bld

Evaluation Time: 1000.00000 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	2.85E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	2.85E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : C-14

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14.bld

Evaluation Time: 1000.00000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
C-14		
C-14	2.85E-02	2.85E-02

Title : C-14

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14.bld

Full Summary

```

=====
=====
=====
RESRAD-BUILD Dose (Time) Tables
=====
=====
=====
    
```

Receptor Dose Received for the Exposure Duration

(mrem)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.49E+01	3.22E-02	3.22E-02	3.18E-02	2.85E-02

Receptor Dose/Yr Averaged Over Exposure Duration

(mrem/yr)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.50E+01	3.22E-02	3.22E-02	3.18E-02	2.86E-02

Title : Pu-239

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239.bld

---

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Title : Pu-239

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239.bld

```

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=====
=====
RESRAD-BUILD Input Parameters
=====
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```

```

Number of Sources : 1
Number of Receptors: 1
Total Time : 3.650000E+02 days
Fraction Inside : 5.000000E-01
    
```

```

===== Receptor Information =====
    
```

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	6.000	6.000	1.000	1.000	1.80E+01	1.00E-04

```

===== Receptor-Source Shielding Relationship =====
    
```

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	1.00E+00	Concrete

==== Building Information ====

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m]	Air Exchanges [m3/hr]	
Area [m2]	*****	
	*	*
	*	*
	*	<=Q01: 7.20E+01
H1: 2.500	* Room 1	* Q10 : 7.20E+01
	* LAMBDA: 8.00E-01	*
Area 36.000	*	*
	*	*
	*****	

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : Pu-239

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239.bld

==== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00[m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::

Nuclide Concentration Dose Conversion Factor (Library: FGR 13 Morbidity)

	[dpm/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity)		
		Ingestion [mrem/dpm]	Inhalation [mrem/dpm]	Submersion [mrem/yr/ (dpm/m3)]
PU-239	8.200E+03	1.595E-03	1.932E-01	2.234E-07
U-235	0.000E+00	1.203E-04	5.541E-02	4.068E-04
PA-231	0.000E+00	4.775E-03	5.766E-01	9.054E-05
AC-227	0.000E+00	6.667E-03	3.027E+00	9.730E-04



Title : Pu-239

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239.bld

Evaluation Time: 0.00000000E+00 years

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```

Assessment for Time: 1

Time =0.00E+00 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	PU-239	8.200E+03
	U-235	0.000E+00
	PA-231	0.000E+00
	AC-227	0.000E+00

Title : Pu-239

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239.bld

Evaluation Time: 0.00000000E+00 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	1.49E+01	1.49E+01
Total	1.49E+01	1.49E+01

Title : Pu-239

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239.bld

Evaluation Time: 0.00000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	1.89E-06	3.76E-06	2.56E-09	1.45E+01	0.00E+00	3.20E-01
Total	1.89E-06	3.76E-06	2.56E-09	1.45E+01	0.00E+00	3.20E-01

Title : Pu-239

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239.bld

Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
PU-239		
PU-239	1.49E+01	1.49E+01
U-235	2.02E-09	2.02E-09
PA-231	1.47E-13	1.47E-13
AC-227	5.68E-15	5.68E-15

Title : Pu-239

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239.bld

Evaluation Time: 1.00000000 years

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```

Assessment for Time: 2

Time =1.00E+00 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	PU-239	4.100E+03
	U-235	4.038E-06
	PA-231	4.272E-11
	AC-227	4.497E-13

Title : Pu-239

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239.bld

Evaluation Time: 1.00000000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	1.26E-06	1.26E-06
Total	1.26E-06	1.26E-06

Title : Pu-239

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	1.26E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	1.26E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Pu-239

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
PU-239		
PU-239	1.26E-06	1.26E-06
U-235	5.77E-12	5.77E-12
PA-231	2.02E-17	2.02E-17
AC-227	3.70E-18	3.70E-18



Title : Pu-239

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239.bld

Evaluation Time: 10.0000000 years

```
=====
=====
=====
Assessment for Time: 3
Time =1.00E+01 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	PU-239	4.099E+03
	U-235	4.037E-05
	PA-231	4.271E-09
	AC-227	4.194E-10

Title : Pu-239

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239.bld

Evaluation Time: 10.0000000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	1.26E-06	1.26E-06
Total	1.26E-06	1.26E-06

Title : Pu-239

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239.bld

Evaluation Time: 10.0000000 years

Pathway Detail of Doses

[mrem]

Source: 1						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.26E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	1.26E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Pu-239

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239.bld

Evaluation Time: 10.0000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
PU-239		
PU-239	1.26E-06	1.26E-06
U-235	4.04E-11	4.04E-11
PA-231	9.54E-16	9.54E-16
AC-227	1.07E-15	1.07E-15

Title : Pu-239

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239.bld

Evaluation Time: 100.000008 years

```
=====
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=====
Assessment for Time: 4
Time =1.00E+02 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	PU-239	4.088E+03
	U-235	4.032E-04
	PA-231	4.265E-07
	AC-227	2.393E-07

Title : Pu-239

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239.bld

Evaluation Time: 100.000008 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	1.26E-06	1.26E-06
Total	1.26E-06	1.26E-06

Title : Pu-239

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239.bld

Evaluation Time: 100.000008 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.26E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	1.26E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Pu-239

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239.bld

Evaluation Time: 100.000008 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
PU-239		
PU-239	1.26E-06	1.26E-06
U-235	3.86E-10	3.86E-10
PA-231	8.72E-14	8.72E-14
AC-227	5.35E-13	5.35E-13



Title : Pu-239

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239.bld

Evaluation Time: 1000.00000 years

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```

Assessment for Time: 5

Time =1.00E+03 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:3.60E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	PU-239	3.984E+03
	U-235	3.980E-03
	PA-231	4.201E-05
	AC-227	3.948E-05

Title : Pu-239

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239.bld

Evaluation Time: 1000.00000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	1.23E-06	1.23E-06
Total	1.23E-06	1.23E-06

Title : Pu-239

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239.bld

Evaluation Time: 1000.00000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.23E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	1.23E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Pu-239

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239.bld

Evaluation Time: 1000.00000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
PU-239		
PU-239	1.22E-06	1.22E-06
U-235	3.79E-09	3.79E-09
PA-231	8.52E-12	8.52E-12
AC-227	8.73E-11	8.73E-11

Title : Pu-239

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239.bld

Full Summary

```

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=====
=====
RESRAD-BUILD Dose (Time) Tables
=====
=====
=====
    
```

Receptor Dose Received for the Exposure Duration

(mrem)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.49E+01	1.26E-06	1.26E-06	1.26E-06	1.23E-06

Receptor Dose/Yr Averaged Over Exposure Duration

(mrem/yr)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.49E+01	1.26E-06	1.26E-06	1.26E-06	1.23E-06

# RESRAD BUILD VERSION 3.22 DATA DCGL<sub>EMC</sub> CALCULATIONS

Title : U-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238 EMC.bld

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For time = 1.00E+01 yr	
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Dose by Pathway Detail.....	15
Dose by Nuclide Detail.....	16
For time = 1.00E+02 yr	
Time Specific Parameters.....	17
Receptor-Source Dose Summary.....	18
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Dose by Nuclide Detail.....	20
For time = 1.00E+03 yr	
Time Specific Parameters.....	21
Receptor-Source Dose Summary.....	22
Dose by Pathway Detail.....	23
Dose by Nuclide Detail.....	24
Full Summary.....	25

Title : U-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238 EMC.bld

```

=====
=====
=====
RESRAD-BUILD Input Parameters
=====
=====
=====
    
```

```

Number of Sources : 1
Number of Receptors: 1
Total Time : 3.650000E+02 days
Fraction Inside : 5.000000E-01
    
```

```

===== Receptor Information =====
    
```

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	6.000	6.000	1.000	1.000	1.80E+01	1.00E-04

```

===== Receptor-Source Shielding Relationship =====
    
```

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete



==== Building Information ====

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m]	Area [m2]	Air Exchanges [m3/hr]
		*****
		* * *
		* * *
		* * *
		* * * <=Q01: 7.20E+01
H1: 2.500		* Room 1 * Q10 : 7.20E+01
		* LAMBDA: 8.00E-01 * * *
Area 36.000		* * *
		*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : U-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238 EMC.bld

==== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00[m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Radon Release Fraction: 1.000E-01

Contamination::

Nuclide Concentration Dose Conversion Factor (Library: FGR 13 Morbidity)

		Ingestion	Inhalation	Submersion
	[dpm/m2]	[mrem/dpm]	[mrem/dpm]	[mrem/yr/ (dpm/m3)]
U-238	2.500E+05	1.212E-04	5.315E-02	7.207E-05
U-234	0.000E+00	1.275E-04	5.946E-02	4.023E-07
TH-230	0.000E+00	2.468E-04	1.468E-01	9.189E-07
RA-226	0.000E+00	5.991E-04	3.874E-03	4.685E-03
PB-210	0.000E+00	2.419E-03	6.216E-03	4.730E-06

Title : U-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238 EMC.bld

Evaluation Time: 0.00000000E+00 years

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=====
=====
=====
Assessment for Time: 1
Time =0.00E+00 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	U-238	2.500E+05
	U-234	0.000E+00
	TH-230	0.000E+00
	RA-226	0.000E+00
	PB-210	0.000E+00

Title : U-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238 EMC.bld

Evaluation Time: 0.00000000E+00 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	1.36E+01	1.36E+01
Total	1.36E+01	1.36E+01

Title : U-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238 EMC.bld

Evaluation Time: 0.00000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.31E-02	3.31E-04	2.80E-06	1.36E+01	1.09E-17	8.24E-02
Total	1.31E-02	3.31E-04	2.80E-06	1.36E+01	1.09E-17	8.24E-02

Title : U-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238 EMC.bld

Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
U-238		
U-238	1.36E+01	1.36E+01
U-234	2.11E-05	2.11E-05
TH-230	1.53E-10	1.53E-10
RA-226	8.52E-16	8.52E-16
PB-210	8.11E-18	8.11E-18

Title : U-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238 EMC.bld

Evaluation Time: 1.00000000 years

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Assessment for Time: 2

Time =1.00E+00 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	U-238	1.250E+05
	U-234	3.544E-01
	TH-230	1.595E-06
	RA-226	2.303E-10
	PB-210	1.779E-12

Title : U-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238 EMC.bld

Evaluation Time: 1.00000000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	8.76E-03	8.76E-03
Total	8.76E-03	8.76E-03



Title : U-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238 EMC.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	8.76E-03	0.00E+00	0.00E+00	0.00E+00	1.36E-16	0.00E+00
Total	8.76E-03	0.00E+00	0.00E+00	0.00E+00	1.36E-16	0.00E+00

Title : U-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238 EMC.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
U-238		
U-238	8.76E-03	8.76E-03
U-234	2.42E-09	2.42E-09
TH-230	1.28E-14	1.28E-14
RA-226	3.07E-15	3.07E-15
PB-210	1.60E-19	1.60E-19

Title : U-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238 EMC.bld

Evaluation Time: 10.0000000 years

```
=====
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=====
=====
=====
```

Assessment for Time: 3

Time =1.00E+01 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	U-238	1.250E+05
	U-234	3.544E+00
	TH-230	1.595E-04
	RA-226	2.301E-07
	PB-210	1.683E-08

Title : U-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238 EMC.bld

Evaluation Time: 10.0000000 years

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=====

RESRAD-BUILDDose Tables

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=====

=====

Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	8.76E-03	8.76E-03
Total	8.76E-03	8.76E-03

Title : U-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238 EMC.bld

Evaluation Time: 10.0000000 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	8.76E-03	0.00E+00	0.00E+00	0.00E+00	4.21E-14	0.00E+00
Total	8.76E-03	0.00E+00	0.00E+00	0.00E+00	4.21E-14	0.00E+00

Title : U-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238 EMC.bld

Evaluation Time: 10.0000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
U-238		
U-238	8.76E-03	8.76E-03
U-234	1.70E-08	1.70E-08
TH-230	6.03E-13	6.03E-13
RA-226	9.48E-13	9.48E-13
PB-210	2.99E-16	2.99E-16

Title : U-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238 EMC.bld

Evaluation Time: 100.000008 years

```
=====
=====
=====
Assessment for Time: 4
Time =1.00E+02 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	U-238	1.250E+05
	U-234	3.543E+01
	TH-230	1.594E-02
	RA-226	2.278E-04
	PB-210	1.061E-04

Title : U-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238 EMC.bld

Evaluation Time: 100.000008 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

---

---

[mrem]

	Source	Total
	1	
Receptor 1	8.76E-03	8.76E-03
Total	8.76E-03	8.76E-03



Title : U-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238 EMC.bld

Evaluation Time: 100.000008 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	8.76E-03	0.00E+00	0.00E+00	0.00E+00	3.65E-11	0.00E+00
Total	8.76E-03	0.00E+00	0.00E+00	0.00E+00	3.65E-11	0.00E+00

Title : U-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238 EMC.bld

Evaluation Time: 100.000008 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
U-238		
U-238	8.76E-03	8.76E-03
U-234	1.62E-07	1.62E-07
TH-230	5.52E-11	5.52E-11
RA-226	8.22E-10	8.22E-10
PB-210	1.58E-12	1.58E-12

Title : U-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238 EMC.bld

Evaluation Time: 1000.00000 years

```
=====
=====
=====
Assessment for Time: 5
Time =1.00E+03 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	U-238	1.250E+05
	U-234	3.539E+02
	TH-230	1.589E+00
	RA-226	2.068E-01
	PB-210	1.886E-01

Title : U-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238 EMC.bld

Evaluation Time: 1000.00000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

---

---

[mrem]

	Source	Total
	1	
Receptor 1	8.76E-03	8.76E-03
Total	8.76E-03	8.76E-03

Title : U-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238 EMC.bld

Evaluation Time: 1000.00000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	8.76E-03	0.00E+00	0.00E+00	0.00E+00	3.26E-08	0.00E+00
Total	8.76E-03	0.00E+00	0.00E+00	0.00E+00	3.26E-08	0.00E+00

Title : U-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238 EMC.bld

Evaluation Time: 1000.00000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
U-238		
U-238	8.76E-03	8.76E-03
U-234	1.61E-06	1.61E-06
TH-230	5.45E-09	5.45E-09
RA-226	7.36E-07	7.36E-07
PB-210	2.76E-09	2.76E-09

Title : U-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-238 EMC.bld

Full Summary

```

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=====
=====
RESRAD-BUILD Dose (Time) Tables
=====
=====
=====
    
```

Receptor Dose Received for the Exposure Duration

(mrem)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.36E+01	8.76E-03	8.76E-03	8.76E-03	8.76E-03

Receptor Dose/Yr Averaged Over Exposure Duration

(mrem/yr)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.37E+01	8.77E-03	8.77E-03	8.77E-03	8.77E-03

Title : Pu-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238 EMC.bld

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Title : Pu-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238 EMC.bld

```

=====
=====
=====
RESRAD-BUILD Input Parameters
=====
=====
=====
    
```

```

Number of Sources : 1
Number of Receptors: 1
Total Time : 3.650000E+02 days
Fraction Inside : 5.000000E-01
    
```

```

===== Receptor Information =====
    
```

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	6.000	6.000	1.000	1.000	1.80E+01	1.00E-04

```

===== Receptor-Source Shielding Relationship =====
    
```

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

==== Building Information ====

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m]	Area [m2]	Air Exchanges [m3/hr]
		*****
		* * *
		* * *
		* * *
		* * * <=Q01: 7.20E+01
H1: 2.500		* Room 1 * Q10 : 7.20E+01
		* LAMBDA: 8.00E-01 * * *
Area 36.000		* * *
		*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : Pu-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238 EMC.bld

==== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00[m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Radon Release Fraction: 1.000E-01

Contamination::

Nuclide Concentration Dose Conversion Factor (Library: FGR 13 Morbidity)

		Ingestion	Inhalation	Submersion
	[dpm/m2]	[mrem/dpm]	[mrem/dpm]	[mrem/yr/ (dpm/m3)]
PU-238	8.000E+04	1.441E-03	1.766E-01	2.572E-07
U-234	0.000E+00	1.275E-04	5.946E-02	4.023E-07
TH-230	0.000E+00	2.468E-04	1.468E-01	9.189E-07
RA-226	0.000E+00	5.991E-04	3.874E-03	4.685E-03
PB-210	0.000E+00	2.419E-03	6.216E-03	4.730E-06

Title : Pu-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238 EMC.bld

Evaluation Time: 0.00000000E+00 years

```
=====
=====
=====
Assessment for Time: 1
Time =0.00E+00 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	PU-238	8.000E+04
	U-234	0.000E+00
	TH-230	0.000E+00
	RA-226	0.000E+00
	PB-210	0.000E+00

Title : Pu-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238 EMC.bld

Evaluation Time: 0.00000000E+00 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	1.45E+01	1.45E+01
Total	1.45E+01	1.45E+01

Title : Pu-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238 EMC.bld

Evaluation Time: 0.00000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	3.30E-04	7.38E-06	3.16E-09	1.42E+01	3.47E-18	3.09E-01
Total	3.30E-04	7.38E-06	3.16E-09	1.42E+01	3.47E-18	3.09E-01

Title : Pu-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238 EMC.bld

Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
PU-238		
PU-238	1.45E+01	1.45E+01
U-234	6.75E-06	6.75E-06
TH-230	4.89E-11	4.89E-11
RA-226	2.72E-16	2.72E-16
PB-210	2.59E-18	2.59E-18

Title : Pu-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238 EMC.bld

Evaluation Time: 1.00000000 years

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=====
=====
```

Assessment for Time: 2

Time =1.00E+00 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	PU-238	3.969E+04
	U-234	1.130E-01
	TH-230	5.091E-07
	RA-226	7.355E-11
	PB-210	5.682E-13



Title : Pu-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238 EMC.bld

Evaluation Time: 1.00000000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	2.18E-04	2.18E-04
Total	2.18E-04	2.18E-04

Title : Pu-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238 EMC.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	2.18E-04	0.00E+00	0.00E+00	0.00E+00	4.34E-17	0.00E+00
Total	2.18E-04	0.00E+00	0.00E+00	0.00E+00	4.34E-17	0.00E+00

Title : Pu-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238 EMC.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
PU-238		
PU-238	2.18E-04	2.18E-04
U-234	7.70E-10	7.70E-10
TH-230	4.06E-15	4.06E-15
RA-226	9.78E-16	9.78E-16
PB-210	5.11E-20	5.11E-20

Title : Pu-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238 EMC.bld

Evaluation Time: 10.0000000 years

```
=====
=====
=====
Assessment for Time: 3
Time =1.00E+01 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	PU-238	3.696E+04
	U-234	1.090E+00
	TH-230	4.972E-05
	RA-226	7.219E-08
	PB-210	5.299E-09

Title : Pu-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238 EMC.bld

Evaluation Time: 10.0000000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	2.03E-04	2.03E-04
Total	2.03E-04	2.03E-04

Title : Pu-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238 EMC.bld

Evaluation Time: 10.0000000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	2.03E-04	0.00E+00	0.00E+00	0.00E+00	1.32E-14	0.00E+00
Total	2.03E-04	0.00E+00	0.00E+00	0.00E+00	1.32E-14	0.00E+00

Title : Pu-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238 EMC.bld

Evaluation Time: 10.0000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
PU-238		
PU-238	2.03E-04	2.03E-04
U-234	5.21E-09	5.21E-09
TH-230	1.88E-13	1.88E-13
RA-226	2.97E-13	2.97E-13
PB-210	9.40E-17	9.40E-17

Title : Pu-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238 EMC.bld

Evaluation Time: 100.000008 years

```
=====
=====
=====
Assessment for Time: 4
Time =1.00E+02 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	PU-238	1.815E+04
	U-234	7.838E+00
	TH-230	3.987E-03
	RA-226	6.048E-05
	PB-210	2.887E-05



Title : Pu-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238 EMC.bld

Evaluation Time: 100.000008 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	9.98E-05	9.98E-05
Total	9.98E-05	9.98E-05

Title : Pu-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238 EMC.bld

Evaluation Time: 100.000008 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	9.98E-05	0.00E+00	0.00E+00	0.00E+00	9.67E-12	0.00E+00
Total	9.98E-05	0.00E+00	0.00E+00	0.00E+00	9.67E-12	0.00E+00

Title : Pu-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238 EMC.bld

Evaluation Time: 100.000008 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
PU-238		
PU-238	9.97E-05	9.97E-05
U-234	3.58E-08	3.58E-08
TH-230	1.38E-11	1.38E-11
RA-226	2.18E-10	2.18E-10
PB-210	4.28E-13	4.28E-13

Title : Pu-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238 EMC.bld

Evaluation Time: 1000.00000 years

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=====
```

Assessment for Time: 5

Time =1.00E+03 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	PU-238	1.483E+01
	U-234	1.431E+01
	TH-230	1.123E-01
	RA-226	1.914E-02
	PB-210	1.789E-02

Title : Pu-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238 EMC.bld

Evaluation Time: 1000.00000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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---

[mrem]

	Source	Total
	1	
Receptor 1	2.15E-07	2.15E-07
Total	2.15E-07	2.15E-07

Title : Pu-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238 EMC.bld

Evaluation Time: 1000.00000 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	2.12E-07	0.00E+00	0.00E+00	0.00E+00	3.02E-09	0.00E+00
Total	2.12E-07	0.00E+00	0.00E+00	0.00E+00	3.02E-09	0.00E+00

Title : Pu-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238 EMC.bld

Evaluation Time: 1000.00000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
PU-238		
PU-238	8.15E-08	8.15E-08
U-234	6.52E-08	6.52E-08
TH-230	3.85E-10	3.85E-10
RA-226	6.81E-08	6.81E-08
PB-210	2.61E-10	2.61E-10

Title : Pu-238 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-238 EMC.bld

Full Summary

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RESRAD-BUILD Dose (Time) Tables
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```

Receptor Dose Received for the Exposure Duration

(mrem)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.45E+01	2.18E-04	2.03E-04	9.98E-05	2.15E-07

Receptor Dose/Yr Averaged Over Exposure Duration

(mrem/yr)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.45E+01	2.18E-04	2.03E-04	9.98E-05	2.16E-07



Title : Pu-239 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239 EMC.bld

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Title : Pu-239 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239 EMC.bld

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RESRAD-BUILD Input Parameters
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```

```

Number of Sources : 1
Number of Receptors: 1
Total Time : 3.650000E+02 days
Fraction Inside : 5.000000E-01
    
```

```

===== Receptor Information =====
    
```

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	6.000	6.000	1.000	1.000	1.80E+01	1.00E-04

```

===== Receptor-Source Shielding Relationship =====
    
```

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	1.00E+00	Concrete

==== Building Information ====

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m]	Area [m2]	Air Exchanges [m3/hr]
		*****
		* * *
		* * *
		* * *
		* * * <=Q01: 7.20E+01
H1: 2.500		* Room 1 * Q10 : 7.20E+01
		* LAMBDA: 8.00E-01 * * *
Area 36.000		* * *
		*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : Pu-239 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239 EMC.bld

==== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00[m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::

Nuclide Concentration Dose Conversion Factor (Library: FGR 13 Morbidity)

	[dpm/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity)		
		Ingestion [mrem/dpm]	Inhalation [mrem/dpm]	Submersion [mrem/yr/ (dpm/m3)]
PU-239	7.300E+04	1.595E-03	1.932E-01	2.234E-07
U-235	0.000E+00	1.203E-04	5.541E-02	4.068E-04
PA-231	0.000E+00	4.775E-03	5.766E-01	9.054E-05
AC-227	0.000E+00	6.667E-03	3.027E+00	9.730E-04

Title : Pu-239 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239 EMC.bld

Evaluation Time: 0.00000000E+00 years

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Assessment for Time: 1

Time =0.00E+00 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	PU-239	7.300E+04
	U-235	0.000E+00
	PA-231	0.000E+00
	AC-227	0.000E+00

Title : Pu-239 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239 EMC.bld

Evaluation Time: 0.00000000E+00 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	1.47E+01	1.47E+01
Total	1.47E+01	1.47E+01

Title : Pu-239 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239 EMC.bld

Evaluation Time: 0.00000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	5.91E-06	3.72E-06	2.53E-09	1.44E+01	0.00E+00	3.17E-01
Total	5.91E-06	3.72E-06	2.53E-09	1.44E+01	0.00E+00	3.17E-01

Title : Pu-239 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239 EMC.bld

Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
PU-239		
PU-239	1.47E+01	1.47E+01
U-235	2.01E-09	2.01E-09
PA-231	1.46E-13	1.46E-13
AC-227	5.62E-15	5.62E-15



Title : Pu-239 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239 EMC.bld

Evaluation Time: 1.00000000 years

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Assessment for Time: 2

Time =1.00E+00 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	PU-239	3.650E+04
	U-235	3.595E-05
	PA-231	3.803E-10
	AC-227	4.004E-12

Title : Pu-239 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239 EMC.bld

Evaluation Time: 1.00000000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	3.94E-06	3.94E-06
Total	3.94E-06	3.94E-06

Title : Pu-239 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239 EMC.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	3.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	3.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Pu-239 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239 EMC.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
PU-239		
PU-239	3.94E-06	3.94E-06
U-235	1.71E-11	1.71E-11
PA-231	5.93E-17	5.93E-17
AC-227	1.11E-17	1.11E-17

Title : Pu-239 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239 EMC.bld

Evaluation Time: 10.0000000 years

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Assessment for Time: 3

Time =1.00E+01 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	PU-239	3.649E+04
	U-235	3.594E-04
	PA-231	3.802E-08
	AC-227	3.733E-09

Title : Pu-239 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239 EMC.bld

Evaluation Time: 10.0000000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	3.94E-06	3.94E-06
Total	3.94E-06	3.94E-06

Title : Pu-239 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239 EMC.bld

Evaluation Time: 10.0000000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	3.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	3.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Pu-239 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239 EMC.bld

Evaluation Time: 10.0000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
PU-239		
PU-239	3.94E-06	3.94E-06
U-235	1.20E-10	1.20E-10
PA-231	2.80E-15	2.80E-15
AC-227	3.21E-15	3.21E-15



Title : Pu-239 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239 EMC.bld

Evaluation Time: 100.000008 years

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Assessment for Time: 4
Time =1.00E+02 yr
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===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	PU-239	3.640E+04
	U-235	3.590E-03
	PA-231	3.797E-06
	AC-227	2.130E-06

Title : Pu-239 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239 EMC.bld

Evaluation Time: 100.000008 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	3.93E-06	3.93E-06
Total	3.93E-06	3.93E-06

Title : Pu-239 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239 EMC.bld

Evaluation Time: 100.000008 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	3.93E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	3.93E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Pu-239 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239 EMC.bld

Evaluation Time: 100.000008 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
PU-239		
PU-239	3.93E-06	3.93E-06
U-235	1.14E-09	1.14E-09
PA-231	2.56E-13	2.56E-13
AC-227	1.60E-12	1.60E-12

Title : Pu-239 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239 EMC.bld

Evaluation Time: 1000.00000 years

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```

Assessment for Time: 5

Time =1.00E+03 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	PU-239	3.546E+04
	U-235	3.543E-02
	PA-231	3.740E-04
	AC-227	3.514E-04

Title : Pu-239 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239 EMC.bld

Evaluation Time: 1000.00000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	3.84E-06	3.84E-06
Total	3.84E-06	3.84E-06

Title : Pu-239 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239 EMC.bld

Evaluation Time: 1000.00000 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	3.84E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	3.84E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Pu-239 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239 EMC.bld

Evaluation Time: 1000.00000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
PU-239		
PU-239	3.83E-06	3.83E-06
U-235	1.12E-08	1.12E-08
PA-231	2.50E-11	2.50E-11
AC-227	2.61E-10	2.61E-10



Title : Pu-239 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Pu-239 EMC.bld

Full Summary

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RESRAD-BUILD Dose (Time) Tables
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```

Receptor Dose Received for the Exposure Duration

(mrem)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.47E+01	3.94E-06	3.94E-06	3.93E-06	3.84E-06

Receptor Dose/Yr Averaged Over Exposure Duration

(mrem/yr)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.47E+01	3.94E-06	3.94E-06	3.93E-06	3.84E-06

Title : U-235 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235 EMC.bld

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For time = 1.00E+00 yr	
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Dose by Pathway Detail.....	11
Dose by Nuclide Detail.....	12
For time = 1.00E+01 yr	
Time Specific Parameters.....	13
Receptor-Source Dose Summary.....	14
Dose by Pathway Detail.....	15
Dose by Nuclide Detail.....	16
For time = 1.00E+02 yr	
Time Specific Parameters.....	17
Receptor-Source Dose Summary.....	18
Dose by Pathway Detail.....	19
Dose by Nuclide Detail.....	20
For time = 1.00E+03 yr	
Time Specific Parameters.....	21
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Dose by Nuclide Detail.....	24
Full Summary.....	25

Title : U-235 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235 EMC.bld

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RESRAD-BUILD Input Parameters
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```

```

Number of Sources : 1
Number of Receptors: 1
Total Time : 3.650000E+02 days
Fraction Inside : 5.000000E-01
    
```

```

===== Receptor Information =====
    
```

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	6.000	6.000	1.000	1.000	1.80E+01	1.00E-04

```

===== Receptor-Source Shielding Relationship =====
    
```

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

==== Building Information ====

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m]	Area [m2]	Air Exchanges [m3/hr]
		*****
		* * *
		* * *
		* * *
		* * * <=Q01: 7.20E+01
H1: 2.500		* Room 1 * Q10 : 7.20E+01
		* LAMBDA: 8.00E-01 * * *
Area 36.000		* * *
		*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : U-235 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235 EMC.bld

==== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00[m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::

Nuclide Concentration Dose Conversion Factor (Library: FGR 13 Morbidity)

	[dpm/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity)		
		Ingestion [mrem/dpm]	Inhalation [mrem/dpm]	Submersion [mrem/yr/ (dpm/m3)]
U-235	2.600E+05	1.203E-04	5.541E-02	4.068E-04
PA-231	0.000E+00	4.775E-03	5.766E-01	9.054E-05
AC-227	0.000E+00	6.667E-03	3.027E+00	9.730E-04

Title : U-235 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235 EMC.bld

Evaluation Time: 0.00000000E+00 years

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Assessment for Time: 1

Time =0.00E+00 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	U-235	2.600E+05
	PA-231	0.000E+00
	AC-227	0.000E+00

Title : U-235 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235 EMC.bld

Evaluation Time: 0.00000000E+00 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	1.49E+01	1.49E+01
Total	1.49E+01	1.49E+01

Title : U-235 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235 EMC.bld

Evaluation Time: 0.00000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	7.07E-02	1.78E-03	1.64E-05	1.47E+01	0.00E+00	8.51E-02
Total	7.07E-02	1.78E-03	1.64E-05	1.47E+01	0.00E+00	8.51E-02



Title : U-235 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235 EMC.bld

Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
U-235		
U-235	1.49E+01	1.49E+01
PA-231	1.62E-03	1.62E-03
AC-227	8.30E-05	8.30E-05

Title : U-235 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235 EMC.bld

Evaluation Time: 1.00000000 years

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Assessment for Time: 2

Time =1.00E+00 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	U-235	1.300E+05
	PA-231	2.751E+00
	AC-227	4.332E-02

Title : U-235 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235 EMC.bld

Evaluation Time: 1.00000000 years

---

---

---

RESRAD-BUILDDose Tables

---

---

---

Source Contributions to Receptor Doses

---

---

[mrem]

	Source	Total
	1	
Receptor 1	4.71E-02	4.71E-02
Total	4.71E-02	4.71E-02

Title : U-235 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235 EMC.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	4.71E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	4.71E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : U-235 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235 EMC.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
U-235		
U-235	4.71E-02	4.71E-02
PA-231	4.25E-07	4.25E-07
AC-227	8.07E-08	8.07E-08

Title : U-235 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235 EMC.bld

Evaluation Time: 10.0000000 years

```
=====
=====
=====
Assessment for Time: 3
Time =1.00E+01 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	U-235	1.300E+05
	PA-231	2.750E+01
	AC-227	3.948E+00

Title : U-235 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235 EMC.bld

Evaluation Time: 10.0000000 years

=====  
=====  
=====  
RESRAD-BUILDDose Tables  
=====  
=====  
=====

Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	4.71E-02	4.71E-02
Total	4.71E-02	4.71E-02

Title : U-235 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235 EMC.bld

Evaluation Time: 10.0000000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	4.71E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	4.71E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00



Title : U-235 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235 EMC.bld

Evaluation Time: 10.0000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
U-235		
U-235	4.71E-02	4.71E-02
PA-231	2.98E-06	2.98E-06
AC-227	3.48E-06	3.48E-06

Title : U-235 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235 EMC.bld

Evaluation Time: 100.000008 years

```
=====
=====
=====
Assessment for Time: 4
Time =1.00E+02 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	U-235	1.300E+05
	PA-231	2.748E+02
	AC-227	1.921E+02

Title : U-235 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235 EMC.bld

Evaluation Time: 100.000008 years

=====  
=====  
=====  
RESRAD-BUILDDose Tables  
=====  
=====  
=====

Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	4.73E-02	4.73E-02
Total	4.73E-02	4.73E-02

Title : U-235 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235 EMC.bld

Evaluation Time: 100.000008 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	4.73E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	4.73E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : U-235 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235 EMC.bld

Evaluation Time: 100.000008 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
U-235		
U-235	4.71E-02	4.71E-02
PA-231	2.85E-05	2.85E-05
AC-227	1.55E-04	1.55E-04

Title : U-235 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235 EMC.bld

Evaluation Time: 1000.00000 years

```
=====
=====
=====
=====
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=====
=====
=====
=====
=====
=====
```

Assessment for Time: 5

Time =1.00E+03 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	U-235	1.300E+05
	PA-231	2.722E+03
	AC-227	2.637E+03

Title : U-235 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235 EMC.bld

Evaluation Time: 1000.00000 years

=====  
=====  
=====  
RESRAD-BUILDDose Tables  
=====  
=====  
=====

Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	4.95E-02	4.95E-02
Total	4.95E-02	4.95E-02

Title : U-235 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235 EMC.bld

Evaluation Time: 1000.00000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	4.95E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	4.95E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00



Title : U-235 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235 EMC.bld

Evaluation Time: 1000.00000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
U-235		
U-235	4.71E-02	4.71E-02
PA-231	2.81E-04	2.81E-04
AC-227	2.12E-03	2.12E-03

Title : U-235 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\U-235 EMC.bld

Full Summary

```

=====
=====
=====
RESRAD-BUILD Dose (Time) Tables
=====
=====
=====
    
```

Receptor Dose Received for the Exposure Duration

(mrem)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.49E+01	4.71E-02	4.71E-02	4.73E-02	4.95E-02

Receptor Dose/Yr Averaged Over Exposure Duration

(mrem/yr)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.49E+01	4.71E-02	4.71E-02	4.73E-02	4.95E-02

Title : Np-237 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237 EMC.bld

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Title : Np-237 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237 EMC.bld

```

=====
=====
=====
RESRAD-BUILD Input Parameters
=====
=====
=====
    
```

```

Number of Sources : 1
Number of Receptors: 1
Total Time : 3.650000E+02 days
Fraction Inside : 5.000000E-01
    
```

```

===== Receptor Information =====
    
```

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	6.000	6.000	1.000	1.000	1.80E+01	1.00E-04

```

===== Receptor-Source Shielding Relationship =====
    
```

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

==== Building Information ====

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m]	Area [m2]	Air Exchanges [m3/hr]
		*****
		* * *
		* * *
		* * *
		* * *
H1: 2.500		* Room 1 * <=Q01: 7.20E+01
		* LAMBDA: 8.00E-01 * Q10 : 7.20E+01
Area 36.000		* * *
		* * *
		*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : Np-237 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237 EMC.bld

==== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00[m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::

Nuclide Concentration Dose Conversion Factor (Library: FGR 13 Morbidity)

	[dpm/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity)		
		Ingestion [mrem/dpm]	Inhalation [mrem/dpm]	Submersion [mrem/yr/ (dpm/m3)]
NP-237	5.800E+04	2.000E-03	2.432E-01	5.450E-04
U-233	0.000E+00	1.302E-04	6.081E-02	8.604E-07
TH-229	0.000E+00	1.815E-03	9.730E-01	7.748E-04

Title : Np-237 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237 EMC.bld

Evaluation Time: 0.00000000E+00 years

```
=====
=====
=====
Assessment for Time: 1
Time =0.00E+00 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	NP-237	5.800E+04
	U-233	0.000E+00
	TH-229	0.000E+00

Title : Np-237 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237 EMC.bld

Evaluation Time: 0.00000000E+00 years

=====

=====

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=====

RESRAD-BUILDDose Tables

=====

=====

=====

Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	1.47E+01	1.47E+01
Total	1.47E+01	1.47E+01



Title : Np-237 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237 EMC.bld

Evaluation Time: 0.00000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	2.14E-02	5.41E-04	4.91E-06	1.44E+01	0.00E+00	3.16E-01
Total	2.14E-02	5.41E-04	4.91E-06	1.44E+01	0.00E+00	3.16E-01

Title : Np-237 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237 EMC.bld

Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
NP-237		
NP-237	1.47E+01	1.47E+01
U-233	7.74E-06	7.74E-06
TH-229	3.81E-09	3.81E-09

Title : Np-237 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237 EMC.bld

Evaluation Time: 1.00000000 years

```
=====
=====
=====
Assessment for Time: 2
Time =1.00E+00 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	NP-237	2.900E+04
	U-233	1.268E-01
	TH-229	5.988E-06

Title : Np-237 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237 EMC.bld

Evaluation Time: 1.00000000 years

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---

---

RESRAD-BUILDDose Tables

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---

---

Source Contributions to Receptor Doses

---

---

[mrem]

	Source	Total
	1	
Receptor 1	1.43E-02	1.43E-02
Total	1.43E-02	1.43E-02

Title : Np-237 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237 EMC.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.43E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	1.43E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Np-237 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237 EMC.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
NP-237		
NP-237	1.43E-02	1.43E-02
U-233	6.53E-10	6.53E-10
TH-229	9.74E-12	9.74E-12

Title : Np-237 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237 EMC.bld

Evaluation Time: 10.0000000 years

```
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=====
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=====
=====
```

Assessment for Time: 3  
Time =1.00E+01 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	NP-237	2.900E+04
	U-233	1.268E+00
	TH-229	5.986E-04

Title : Np-237 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237 EMC.bld

Evaluation Time: 10.0000000 years

=====

=====

=====

=====

RESRAD-BUILDDose Tables

=====

=====

=====

Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	1.43E-02	1.43E-02
Total	1.43E-02	1.43E-02



Title : Np-237 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237 EMC.bld

Evaluation Time: 10.0000000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.43E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	1.43E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Np-237 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237 EMC.bld

Evaluation Time: 10.0000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
NP-237		
NP-237	1.43E-02	1.43E-02
U-233	4.57E-09	4.57E-09
TH-229	4.61E-10	4.61E-10

Title : Np-237 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237 EMC.bld

Evaluation Time: 100.000008 years

```
=====
=====
=====
=====
=====
=====
=====
=====
=====
=====
=====
```

Assessment for Time: 4

Time =1.00E+02 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	NP-237	2.900E+04
	U-233	1.268E+01
	TH-229	5.968E-02

Title : Np-237 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237 EMC.bld

Evaluation Time: 100.000008 years

=====

=====

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RESRAD-BUILDDose Tables

=====

=====

=====

Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	1.43E-02	1.43E-02
Total	1.43E-02	1.43E-02

Title : Np-237 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237 EMC.bld

Evaluation Time: 100.000008 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.43E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	1.43E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Np-237 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237 EMC.bld

Evaluation Time: 100.000008 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
NP-237		
NP-237	1.43E-02	1.43E-02
U-233	4.38E-08	4.38E-08
TH-229	4.21E-08	4.21E-08

Title : Np-237 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237 EMC.bld

Evaluation Time: 1000.00000 years

```
=====
=====
=====
Assessment for Time: 5
Time =1.00E+03 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	NP-237	2.899E+04
	U-233	1.265E+02
	TH-229	5.795E+00

Title : Np-237 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237 EMC.bld

Evaluation Time: 1000.00000 years

=====

=====

=====

=====

RESRAD-BUILDDose Tables

=====

=====

=====

Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	1.43E-02	1.43E-02
Total	1.43E-02	1.43E-02



Title : Np-237 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237 EMC.bld

Evaluation Time: 1000.00000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.43E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	1.43E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Np-237 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237 EMC.bld

Evaluation Time: 1000.00000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
NP-237		
NP-237	1.43E-02	1.43E-02
U-233	4.35E-07	4.35E-07
TH-229	4.05E-06	4.05E-06

Title : Np-237 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Np-237 EMC.bld

Full Summary

```

=====
=====
=====
RESRAD-BUILD Dose (Time) Tables
=====
=====
=====
    
```

Receptor Dose Received for the Exposure Duration

(mrem)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.47E+01	1.43E-02	1.43E-02	1.43E-02	1.43E-02

Receptor Dose/Yr Averaged Over Exposure Duration

(mrem/yr)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.47E+01	1.43E-02	1.43E-02	1.43E-02	1.43E-02

Title : Th-232 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232 EMC.bld

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Title : Th-232 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232 EMC.bld

```

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=====
RESRAD-BUILD Input Parameters
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```

```

Number of Sources : 1
Number of Receptors: 1
Total Time : 3.650000E+02 days
Fraction Inside : 5.000000E-01
    
```

```

===== Receptor Information =====
    
```

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	6.000	6.000	1.000	1.000	1.80E+01	1.00E-04

```

===== Receptor-Source Shielding Relationship =====
    
```

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

Title : Th-232 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232 EMC.bld

==== Building Information ====

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m]	Area [m2]	Air Exchanges [m3/hr]
		*****
		* * *
		* * *
		* * *
		* * *
H1: 2.500		* Room 1 * <=Q01: 2.00E+02
		* LAMBDA: 8.00E-01 * Q10 : 2.00E+02
Area 100.000		* * *
		* * *
		*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : Th-232 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232 EMC.bld

==== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00[m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Radon Release Fraction: 1.000E-01

Contamination::

Nuclide Concentration Dose Conversion Factor (Library: FGR 13 Morbidity)

	Nuclide Concentration [dpm/m2]	Ingestion [mrem/dpm]	Inhalation [mrem/dpm]	Submersion [mrem/yr/ (dpm/m3)]
TH-232	5.500E+04	1.230E-03	7.387E-01	4.595E-07
TH-228	0.000E+00	3.640E-04	1.554E-01	4.239E-03
RA-228	0.000E+00	6.486E-04	2.288E-03	2.518E-03

Title : Th-232 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232 EMC.bld

Evaluation Time: 0.00000000E+00 years

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=====
```

Assessment for Time: 1  
Time =0.00E+00 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	TH-232	5.500E+04
	TH-228	0.000E+00
	RA-228	0.000E+00



Title : Th-232 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232 EMC.bld

Evaluation Time: 0.00000000E+00 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	1.50E+01	1.50E+01
Total	1.50E+01	1.50E+01

Title : Th-232 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232 EMC.bld

Evaluation Time: 0.00000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	4.85E-03	5.72E-05	4.46E-07	1.49E+01	1.83E-04	6.80E-02
Total	4.85E-03	5.72E-05	4.46E-07	1.49E+01	1.83E-04	6.80E-02

Title : Th-232 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232 EMC.bld

Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
TH-232		
TH-232	1.50E+01	1.50E+01
TH-228	1.48E-02	1.48E-02
RA-228	8.18E-03	8.18E-03

Title : Th-232 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232 EMC.bld

Evaluation Time: 1.00000000 years

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=====
=====
Assessment for Time: 2
Time =1.00E+00 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	TH-232	2.750E+04
	TH-228	5.127E+02
	RA-228	3.123E+03

Title : Th-232 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232 EMC.bld

Evaluation Time: 1.00000000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	1.28E-02	1.28E-02
Total	1.28E-02	1.28E-02

Title : Th-232 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232 EMC.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.19E-02	0.00E+00	0.00E+00	0.00E+00	8.96E-04	0.00E+00
Total	1.19E-02	0.00E+00	0.00E+00	0.00E+00	8.96E-04	0.00E+00

Title : Th-232 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232 EMC.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
TH-232		
TH-232	8.48E-05	8.48E-05
TH-228	3.98E-03	3.98E-03
RA-228	8.72E-03	8.72E-03

Title : Th-232 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232 EMC.bld

Evaluation Time: 10.0000000 years

```
=====
=====
=====
Assessment for Time: 3
Time =1.00E+01 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	TH-232	2.750E+04
	TH-228	1.552E+04
	RA-228	1.926E+04



Title : Th-232 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232 EMC.bld

Evaluation Time: 10.0000000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	9.71E-02	9.71E-02
Total	9.71E-02	9.71E-02

Title : Th-232 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232 EMC.bld

Evaluation Time: 10.0000000 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	8.38E-02	0.00E+00	0.00E+00	0.00E+00	1.33E-02	0.00E+00
Total	8.38E-02	0.00E+00	0.00E+00	0.00E+00	1.33E-02	0.00E+00

Title : Th-232 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232 EMC.bld

Evaluation Time: 10.0000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
TH-232		
TH-232	8.48E-05	8.48E-05
TH-228	5.90E-02	5.90E-02
RA-228	3.80E-02	3.80E-02

Title : Th-232 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232 EMC.bld

Evaluation Time: 100.000008 years

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Assessment for Time: 4
Time =1.00E+02 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	TH-232	2.750E+04
	TH-228	2.750E+04
	RA-228	2.750E+04

Title : Th-232 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232 EMC.bld

Evaluation Time: 100.000008 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	1.53E-01	1.53E-01
Total	1.53E-01	1.53E-01

Title : Th-232 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232 EMC.bld

Evaluation Time: 100.000008 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	1.31E-01	0.00E+00	0.00E+00	0.00E+00	2.26E-02	0.00E+00
Total	1.31E-01	0.00E+00	0.00E+00	0.00E+00	2.26E-02	0.00E+00

Title : Th-232 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232 EMC.bld

Evaluation Time: 100.000008 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
TH-232		
TH-232	8.48E-05	8.48E-05
TH-228	1.00E-01	1.00E-01
RA-228	5.29E-02	5.29E-02

Title : Th-232 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232 EMC.bld

Evaluation Time: 1000.00000 years

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```

Assessment for Time: 5

Time =1.00E+03 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	TH-232	2.750E+04
	TH-228	2.750E+04
	RA-228	2.750E+04



Title : Th-232 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232 EMC.bld

Evaluation Time: 1000.00000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	1.53E-01	1.53E-01
Total	1.53E-01	1.53E-01

Title : Th-232 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232 EMC.bld

Evaluation Time: 1000.00000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.31E-01	0.00E+00	0.00E+00	0.00E+00	2.26E-02	0.00E+00
Total	1.31E-01	0.00E+00	0.00E+00	0.00E+00	2.26E-02	0.00E+00

Title : Th-232 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232 EMC.bld

Evaluation Time: 1000.00000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
TH-232		
TH-232	8.48E-05	8.48E-05
TH-228	1.00E-01	1.00E-01
RA-228	5.29E-02	5.29E-02

Title : Th-232 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Th-232 EMC.bld

Full Summary

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RESRAD-BUILD Dose (Time) Tables
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```

Receptor Dose Received for the Exposure Duration

(mrem)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.50E+01	1.28E-02	9.71E-02	1.53E-01	1.53E-01

Receptor Dose/Yr Averaged Over Exposure Duration

(mrem/yr)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.50E+01	1.28E-02	9.71E-02	1.53E-01	1.53E-01

Title : H-3 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3 EMC.bld

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Dose by Nuclide Detail.....	12
For time = 1.00E+01 yr	
Time Specific Parameters.....	13
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Dose by Pathway Detail.....	15
Dose by Nuclide Detail.....	16
For time = 1.00E+02 yr	
Time Specific Parameters.....	17
Receptor-Source Dose Summary.....	18
Dose by Pathway Detail.....	19
Dose by Nuclide Detail.....	20
For time = 1.00E+03 yr	
Time Specific Parameters.....	21
Receptor-Source Dose Summary.....	22
Dose by Pathway Detail.....	23
Dose by Nuclide Detail.....	24
Full Summary.....	25

Title : H-3 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3 EMC.bld

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RESRAD-BUILD Input Parameters
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```

```

Number of Sources : 1
Number of Receptors: 1
Total Time : 3.650000E+02 days
Fraction Inside : 5.000000E-01
    
```

```

===== Receptor Information =====
    
```

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion (Dust) [m2/hr]
1	1	6.000	6.000	1.000	1.000	1.80E+01	1.00E-04

```

===== Receptor-Source Shielding Relationship =====
    
```

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

==== Building Information =====

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m]	Area [m2]	Air Exchanges [m3/hr]
*****		
* * *		
* <=Q01: 7.20E+01		
H1: 2.500		* Q10 : 7.20E+01
		* Room 1
		* LAMBDA: 8.00E-01
Area 36.000		* * *
*****		

Deposition velocity: 1.00E-02 [m/s]    Resuspension Rate: 5.00E-07 [1/s]

Title : H-3 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3 EMC.bld

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00[m]  
 Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z  
 Pathway ::  
     Direct Ingestion Rate: 0.000E+00 [1/hr]  
     Fraction released to air: 1.000E-01  
     Removable fraction: 5.000E-01  
     Time to Remove: 3.650E+02 [day]

Contamination::

Nuclide	Concentration [dpm/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity)		
		Ingestion [mrem/dpm]	Inhalation [mrem/dpm]	Submersion [mrem/yr/ (dpm/m3)]
H-3	1.300E+11	2.883E-08	2.883E-08	0.000E+00



Title : H-3 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3 EMC.bld

Evaluation Time: 0.00000000E+00 years

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Assessment for Time: 1  
Time =0.00E+00 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]  
Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z  
Pathway ::  
Direct Ingestion Rate: 0.000E+00 [1/hr]  
Fraction released to air: 1.000E-01  
Removable fraction: 5.000E-01  
Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	H-3	1.300E+11

Title : H-3 EMC  
Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3 EMC.bld  
Evaluation Time: 0.00000000E+00 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	1.45E+01	1.45E+01
Total	1.45E+01	1.45E+01

Title : H-3 EMC  
Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3 EMC.bld  
Evaluation Time: 0.00000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	0.00E+00	0.00E+00	0.00E+00	5.24E+00	0.00E+00	9.29E+00
Total	0.00E+00	0.00E+00	0.00E+00	5.24E+00	0.00E+00	9.29E+00

Title : H-3 EMC  
Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3 EMC.bld  
Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
H-3	1	
H-3	1.45E+01	1.45E+01

Title : H-3 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3 EMC.bld

Evaluation Time: 1.00000000 years

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Assessment for Time: 2  
Time =1.00E+00 yr

===== Source Information =====

Source: 1  
Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]  
Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z  
Pathway ::  
Direct Ingestion Rate: 0.000E+00 [1/hr]  
Fraction released to air: 1.000E-01  
Removable fraction: 0.000E+00  
Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	H-3	6.145E+10

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	0.00E+00	0.00E+00
Total	0.00E+00	0.00E+00

Title : H-3 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3 EMC.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : H-3 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3 EMC.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
H-3	1	
H-3	0.00E+00	0.00E+00



Title : H-3 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3 EMC.bld

Evaluation Time: 10.0000000 years

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```

Assessment for Time: 3  
Time =1.00E+01 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]  
Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z  
Pathway ::  
Direct Ingestion Rate: 0.000E+00 [1/hr]  
Fraction released to air: 1.000E-01  
Removable fraction: 0.000E+00  
Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
	H-3	3.708E+10 [dpm/m2]

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	0.00E+00	0.00E+00
Total	0.00E+00	0.00E+00

Title : H-3 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3 EMC.bld

Evaluation Time: 10.0000000 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : H-3 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3 EMC.bld

Evaluation Time: 10.0000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
H-3	1	
H-3	0.00E+00	0.00E+00

Title : H-3 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3 EMC.bld

Evaluation Time: 100.000008 years

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```

Assessment for Time: 4  
Time =1.00E+02 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]  
Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z  
Pathway ::  
Direct Ingestion Rate: 0.000E+00 [1/hr]  
Fraction released to air: 1.000E-01  
Removable fraction: 0.000E+00  
Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	H-3	2.374E+08

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=====  
===== RESRAD-BUILDDose Tables =====  
=====  
=====  
=====

Source Contributions to Receptor Doses  
[mrem]

	Source	Total
	1	
Receptor 1	0.00E+00	0.00E+00
Total	0.00E+00	0.00E+00

Title : H-3 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3 EMC.bld

Evaluation Time: 100.000008 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : H-3 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3 EMC.bld

Evaluation Time: 100.000008 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
H-3	1	
H-3	0.00E+00	0.00E+00



Title : H-3 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3 EMC.bld

Evaluation Time: 1000.00000 years

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=====
```

Assessment for Time: 5  
Time =1.00E+03 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]  
Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z  
Pathway ::  
Direct Ingestion Rate: 0.000E+00 [1/hr]  
Fraction released to air: 1.000E-01  
Removable fraction: 0.000E+00  
Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
	H-3	2.742E-14 [dpm/m2]

Title : H-3 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3 EMC.bld

Evaluation Time: 1000.00000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	0.00E+00	0.00E+00
Total	0.00E+00	0.00E+00

Title : H-3 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3 EMC.bld

Evaluation Time: 1000.00000 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : H-3 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3 EMC.bld

Evaluation Time: 1000.00000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
H-3	1	
H-3	0.00E+00	0.00E+00

Title : H-3 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\H-3 EMC.bld

Full Summary

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RESRAD-BUILD Dose (Time) Tables

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Receptor Dose Received for the Exposure Duration

=====

(mrem)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.45E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Receptor Dose/Yr Averaged Over Exposure Duration

=====

(mrem/yr)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.45E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Ra-226 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226 EMC.bld

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Title : Ra-226 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226 EMC.bld

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RESRAD-BUILD Input Parameters
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```

```

Number of Sources : 1
Number of Receptors: 1
Total Time : 3.650000E+02 days
Fraction Inside : 5.000000E-01
    
```

```

===== Receptor Information =====
    
```

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	6.000	6.000	1.000	1.000	1.80E+01	1.00E-04

```

===== Receptor-Source Shielding Relationship =====
    
```

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

==== Building Information ====

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m]	Area [m2]	Air Exchanges [m3/hr]
		*****
		* * *
		* * *
		* * *
		* * * <=Q01: 7.20E+01
H1: 2.500		* Room 1 * Q10 : 7.20E+01
		* LAMBDA: 8.00E-01 * * *
Area 36.000		* * *
		*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]



Title : Ra-226 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226 EMC.bld

==== Source Information ====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00[m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Radon Release Fraction: 1.000E-01

Contamination::

Nuclide Concentration Dose Conversion Factor (Library: FGR 13 Morbidity)

	[dpm/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity)		
		Ingestion [mrem/dpm]	Inhalation [mrem/dpm]	Submersion [mrem/yr/ (dpm/m3)]
RA-226	1.700E+06	5.991E-04	3.874E-03	4.685E-03
PB-210	0.000E+00	2.419E-03	6.216E-03	4.730E-06

Title : Ra-226 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226 EMC.bld

Evaluation Time: 0.00000000E+00 years

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=====
Assessment for Time: 1
Time =0.00E+00 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	RA-226	1.700E+06
	PB-210	0.000E+00

Title : Ra-226 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226 EMC.bld

Evaluation Time: 0.00000000E+00 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	1.44E+01	1.44E+01
Total	1.44E+01	1.44E+01

Title : Ra-226 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226 EMC.bld

Evaluation Time: 0.00000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	4.33E+00	1.10E-01	1.24E-03	6.87E+00	2.01E-01	2.93E+00
Total	4.33E+00	1.10E-01	1.24E-03	6.87E+00	2.01E-01	2.93E+00

Title : Ra-226 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226 EMC.bld

Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
RA-226		
RA-226	1.41E+01	1.41E+01
PB-210	3.19E-01	3.19E-01

Title : Ra-226 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226 EMC.bld

Evaluation Time: 1.00000000 years

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```

Assessment for Time: 2

Time =1.00E+00 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	RA-226	8.496E+05
	PB-210	2.601E+04

Title : Ra-226 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226 EMC.bld

Evaluation Time: 1.00000000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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---

[mrem]

	Source	Total
	1	
Receptor 1	3.02E+00	3.02E+00
Total	3.02E+00	3.02E+00

Title : Ra-226 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226 EMC.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	2.88E+00	0.00E+00	0.00E+00	0.00E+00	1.34E-01	0.00E+00
Total	2.88E+00	0.00E+00	0.00E+00	0.00E+00	1.34E-01	0.00E+00



Title : Ra-226 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226 EMC.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
RA-226		
RA-226	3.02E+00	3.02E+00
PB-210	5.64E-04	5.64E-04

Title : Ra-226 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226 EMC.bld

Evaluation Time: 10.0000000 years

```
=====
=====
=====
Assessment for Time: 3
Time =1.00E+01 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	RA-226	8.463E+05
	PB-210	2.266E+05

Title : Ra-226 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226 EMC.bld

Evaluation Time: 10.0000000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	3.01E+00	3.01E+00
Total	3.01E+00	3.01E+00

Title : Ra-226 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226 EMC.bld

Evaluation Time: 10.0000000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	2.88E+00	0.00E+00	0.00E+00	0.00E+00	1.33E-01	0.00E+00
Total	2.88E+00	0.00E+00	0.00E+00	0.00E+00	1.33E-01	0.00E+00

Title : Ra-226 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226 EMC.bld

Evaluation Time: 10.0000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
RA-226		
RA-226	3.01E+00	3.01E+00
PB-210	3.44E-03	3.44E-03

Title : Ra-226 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226 EMC.bld

Evaluation Time: 100.000008 years

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Assessment for Time: 4
Time =1.00E+02 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	RA-226	8.140E+05
	PB-210	7.870E+05

Title : Ra-226 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226 EMC.bld

Evaluation Time: 100.000008 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	2.90E+00	2.90E+00
Total	2.90E+00	2.90E+00

Title : Ra-226 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226 EMC.bld

Evaluation Time: 100.000008 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	2.77E+00	0.00E+00	0.00E+00	0.00E+00	1.28E-01	0.00E+00
Total	2.77E+00	0.00E+00	0.00E+00	0.00E+00	1.28E-01	0.00E+00



Title : Ra-226 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226 EMC.bld

Evaluation Time: 100.000008 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
RA-226		
RA-226	2.89E+00	2.89E+00
PB-210	1.15E-02	1.15E-02

Title : Ra-226 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226 EMC.bld

Evaluation Time: 1000.00000 years

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=====
```

Assessment for Time: 5

Time =1.00E+03 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	RA-226	5.512E+05
	PB-210	5.589E+05

Title : Ra-226 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226 EMC.bld

Evaluation Time: 1000.00000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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---

[mrem]

	Source	Total
	1	
Receptor 1	1.97E+00	1.97E+00
Total	1.97E+00	1.97E+00

Title : Ra-226 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226 EMC.bld

Evaluation Time: 1000.00000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.88E+00	0.00E+00	0.00E+00	0.00E+00	8.69E-02	0.00E+00
Total	1.88E+00	0.00E+00	0.00E+00	0.00E+00	8.69E-02	0.00E+00

Title : Ra-226 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226 EMC.bld

Evaluation Time: 1000.00000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
RA-226		
RA-226	1.96E+00	1.96E+00
PB-210	8.15E-03	8.15E-03

Title : Ra-226 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Ra-226 EMC.bld

Full Summary

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=====
RESRAD-BUILD Dose (Time) Tables
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=====
=====
    
```

Receptor Dose Received for the Exposure Duration

(mrem)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.44E+01	3.02E+00	3.01E+00	2.90E+00	1.97E+00

Receptor Dose/Yr Averaged Over Exposure Duration

(mrem/yr)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.45E+01	3.02E+00	3.01E+00	2.91E+00	1.97E+00

Title : Sr-90 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90 EMC.bld

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Time Specific Parameters.....	9
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Dose by Pathway Detail.....	11
Dose by Nuclide Detail.....	12
For time = 1.00E+01 yr	
Time Specific Parameters.....	13
Receptor-Source Dose Summary.....	14
Dose by Pathway Detail.....	15
Dose by Nuclide Detail.....	16
For time = 1.00E+02 yr	
Time Specific Parameters.....	17
Receptor-Source Dose Summary.....	18
Dose by Pathway Detail.....	19
Dose by Nuclide Detail.....	20
For time = 1.00E+03 yr	
Time Specific Parameters.....	21
Receptor-Source Dose Summary.....	22
Dose by Pathway Detail.....	23
Dose by Nuclide Detail.....	24
Full Summary.....	25

Title : Sr-90 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90 EMC.bld

```

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RESRAD-BUILD Input Parameters
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=====
    
```

```

Number of Sources : 1
Number of Receptors: 1
Total Time : 3.650000E+02 days
Fraction Inside : 5.000000E-01
    
```

```

===== Receptor Information =====
    
```

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	6.000	6.000	1.000	1.000	1.80E+01	1.00E-04

```

===== Receptor-Source Shielding Relationship =====
    
```

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete



==== Building Information =====

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m]	Area [m2]	Air Exchanges [m3/hr]
		*****
		* * *
		* * *
		* * *
		* * * <=Q01: 7.20E+01
H1: 2.500		* Room 1 * Q10 : 7.20E+01
		* LAMBDA: 8.00E-01 * *
Area 36.000		* * *
		* * *
		*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : Sr-90 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90 EMC.bld

==== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00[m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::

Nuclide Concentration Dose Conversion Factor (Library: FGR 13 Morbidity)

		Ingestion	Inhalation	Submersion
	[dpm/m2]	[mrem/dpm]	[mrem/dpm]	[mrem/yr/ (dpm/m3)]
SR-90	1.800E+07	6.892E-05	5.901E-04	1.041E-05

Title : Sr-90 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90 EMC.bld

Evaluation Time: 0.00000000E+00 years

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```

Assessment for Time: 1

Time =0.00E+00 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	SR-90	1.800E+07

Title : Sr-90 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90 EMC.bld

Evaluation Time: 0.00000000E+00 years

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RESRAD-BUILDDose Tables

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---

Source Contributions to Receptor Doses

---

---

[mrem]

	Source	Total
	1	
Receptor 1	1.38E+01	1.38E+01
Total	1.38E+01	1.38E+01

Title : Sr-90 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90 EMC.bld

Evaluation Time: 0.00000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.54E-01	3.81E-03	2.80E-05	1.04E+01	0.00E+00	3.24E+00
Total	1.54E-01	3.81E-03	2.80E-05	1.04E+01	0.00E+00	3.24E+00

Title : Sr-90 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90 EMC.bld

Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
SR-90		
SR-90	1.38E+01	1.38E+01

Title : Sr-90 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90 EMC.bld

Evaluation Time: 1.00000000 years

```
=====
=====
=====
Assessment for Time: 2
Time =1.00E+00 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	SR-90	8.788E+06

Title : Sr-90 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90 EMC.bld

Evaluation Time: 1.00000000 years

---

---

---

RESRAD-BUILDDose Tables

---

---

---

Source Contributions to Receptor Doses

---

---

[mrem]

	Source	Total
	1	
Receptor 1	1.00E-01	1.00E-01
Total	1.00E-01	1.00E-01



Title : Sr-90 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90 EMC.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	1.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Sr-90 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90 EMC.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
SR-90		
SR-90	1.00E-01	1.00E-01

Title : Sr-90 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90 EMC.bld

Evaluation Time: 10.0000000 years

```
=====
=====
=====
Assessment for Time: 3
Time =1.00E+01 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	SR-90	7.094E+06

Title : Sr-90 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90 EMC.bld

Evaluation Time: 10.0000000 years

=====

=====

=====

=====

RESRAD-BUILDDose Tables

=====

=====

=====

Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	8.10E-02	8.10E-02
Total	8.10E-02	8.10E-02

Title : Sr-90 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90 EMC.bld

Evaluation Time: 10.0000000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	8.10E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	8.10E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Sr-90 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90 EMC.bld

Evaluation Time: 10.0000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
SR-90		
SR-90	8.10E-02	8.10E-02

Title : Sr-90 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90 EMC.bld

Evaluation Time: 100.000008 years

```
=====
=====
=====
Assessment for Time: 4
Time =1.00E+02 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	SR-90	8.327E+05

Title : Sr-90 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90 EMC.bld

Evaluation Time: 100.000008 years

---

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RESRAD-BUILDDose Tables

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---

Source Contributions to Receptor Doses

---

---

[mrem]

	Source	Total
	1	
Receptor 1	9.50E-03	9.50E-03
Total	9.50E-03	9.50E-03



Title : Sr-90 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90 EMC.bld

Evaluation Time: 100.000008 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	9.50E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	9.50E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Sr-90 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90 EMC.bld

Evaluation Time: 100.000008 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
SR-90		
SR-90	9.50E-03	9.50E-03

Title : Sr-90 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90 EMC.bld

Evaluation Time: 1000.00000 years

```
=====
=====
=====
Assessment for Time: 5
Time =1.00E+03 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	SR-90	4.137E-04

Title : Sr-90 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90 EMC.bld

Evaluation Time: 1000.00000 years

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RESRAD-BUILDDose Tables

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---

Source Contributions to Receptor Doses

---

---

[mrem]

	Source	Total
	1	
Receptor 1	4.72E-12	4.72E-12
Total	4.72E-12	4.72E-12

Title : Sr-90 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90 EMC.bld

Evaluation Time: 1000.00000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	4.72E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	4.72E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Sr-90 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90 EMC.bld

Evaluation Time: 1000.00000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
SR-90		
SR-90	4.72E-12	4.72E-12

Title : Sr-90 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Sr-90 EMC.bld

Full Summary

```

=====
=====
=====
RESRAD-BUILD Dose (Time) Tables
=====
=====
=====
    
```

Receptor Dose Received for the Exposure Duration

(mrem)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.38E+01	1.00E-01	8.10E-02	9.50E-03	4.72E-12

Receptor Dose/Yr Averaged Over Exposure Duration

(mrem/yr)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.38E+01	1.00E-01	8.10E-02	9.51E-03	4.72E-12

Title : Cs-137 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137 EMC.bld

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Title : Cs-137 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137 EMC.bld

```

=====
=====
=====
RESRAD-BUILD Input Parameters
=====
=====
=====
    
```

```

Number of Sources : 1
Number of Receptors: 1
Total Time : 3.650000E+02 days
Fraction Inside : 5.000000E-01
    
```

```

===== Receptor Information =====
    
```

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	6.000	6.000	1.000	1.000	1.80E+01	1.00E-04

```

===== Receptor-Source Shielding Relationship =====
    
```

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

Title : Cs-137 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137 EMC.bld

==== Building Information =====

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m]	Area [m2]	Air Exchanges [m3/hr]
		*****
		* * *
		* * *
		* * *
		* * * <=Q01: 7.20E+01
H1: 2.500		* Room 1 * Q10 : 7.20E+01
		* LAMBDA: 8.00E-01 * * *
Area 36.000		* * *
		*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : Cs-137 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137 EMC.bld

==== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00[m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::

Nuclide Concentration Dose Conversion Factor (Library: FGR 13 Morbidity)

	[dpm/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity)		
		Ingestion [mrem/dpm]	Inhalation [mrem/dpm]	Submersion [mrem/yr/ (dpm/m3)]
CS-137	1.600E+07	2.252E-05	1.437E-05	1.437E-03

Title : Cs-137 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137 EMC.bld

Evaluation Time: 0.00000000E+00 years

```
=====
=====
=====
=====
=====
=====
=====
=====
=====
=====
=====
```

Assessment for Time: 1

Time =0.00E+00 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	CS-137	1.600E+07

Title : Cs-137 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137 EMC.bld

Evaluation Time: 0.00000000E+00 years

=====  
=====  
=====  
RESRAD-BUILDDose Tables  
=====  
=====  
=====

Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	1.50E+01	1.50E+01
Total	1.50E+01	1.50E+01

Title : Cs-137 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137 EMC.bld

Evaluation Time: 0.00000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.35E+01	3.34E-01	3.44E-03	2.26E-01	0.00E+00	9.43E-01
Total	1.35E+01	3.34E-01	3.44E-03	2.26E-01	0.00E+00	9.43E-01

Title : Cs-137 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137 EMC.bld

Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
CS-137		
CS-137	1.50E+01	1.50E+01

Title : Cs-137 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137 EMC.bld

Evaluation Time: 1.00000000 years

```
=====
=====
=====
Assessment for Time: 2
Time =1.00E+00 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	CS-137	7.817E+06



Title : Cs-137 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137 EMC.bld

Evaluation Time: 1.00000000 years

=====  
=====  
=====  
RESRAD-BUILDDose Tables  
=====  
=====  
=====

Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	8.79E+00	8.79E+00
Total	8.79E+00	8.79E+00

Title : Cs-137 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137 EMC.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	8.79E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	8.79E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Cs-137 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137 EMC.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
CS-137		
CS-137	8.79E+00	8.79E+00

Title : Cs-137 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137 EMC.bld

Evaluation Time: 10.0000000 years

```
=====
=====
=====
Assessment for Time: 3
Time =1.00E+01 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	CS-137	6.350E+06

Title : Cs-137 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137 EMC.bld

Evaluation Time: 10.0000000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

---

---

[mrem]

	Source	Total
	1	
Receptor 1	7.14E+00	7.14E+00
Total	7.14E+00	7.14E+00

Title : Cs-137 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137 EMC.bld

Evaluation Time: 10.0000000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	7.14E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	7.14E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Cs-137 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137 EMC.bld

Evaluation Time: 10.0000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
CS-137		
CS-137	7.14E+00	7.14E+00

Title : Cs-137 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137 EMC.bld

Evaluation Time: 100.000008 years

```
=====
=====
=====
Assessment for Time: 4
Time =1.00E+02 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	CS-137	7.937E+05



Title : Cs-137 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137 EMC.bld

Evaluation Time: 100.000008 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

---

---

[mrem]

	Source	Total
	1	
Receptor 1	8.93E-01	8.93E-01
Total	8.93E-01	8.93E-01

Title : Cs-137 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137 EMC.bld

Evaluation Time: 100.000008 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	8.93E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	8.93E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Cs-137 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137 EMC.bld

Evaluation Time: 100.000008 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
CS-137		
CS-137	8.93E-01	8.93E-01

Title : Cs-137 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137 EMC.bld

Evaluation Time: 1000.00000 years

```
=====
=====
=====
Assessment for Time: 5
Time =1.00E+03 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	CS-137	7.392E-04

Title : Cs-137 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137 EMC.bld

Evaluation Time: 1000.00000 years

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RESRAD-BUILDDose Tables

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---

Source Contributions to Receptor Doses

---

---

[mrem]

	Source	Total
	1	
Receptor 1	8.31E-10	8.31E-10
Total	8.31E-10	8.31E-10

Title : Cs-137 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137 EMC.bld

Evaluation Time: 1000.00000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	8.31E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	8.31E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : Cs-137 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137 EMC.bld

Evaluation Time: 1000.00000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
CS-137		
CS-137	8.31E-10	8.31E-10

Title : Cs-137 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\Cs-137 EMC.bld

Full Summary

```

=====
=====
=====
RESRAD-BUILD Dose (Time) Tables
=====
=====
=====
    
```

Receptor Dose Received for the Exposure Duration

(mrem)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.50E+01	8.79E+00	7.14E+00	8.93E-01	8.31E-10

Receptor Dose/Yr Averaged Over Exposure Duration

(mrem/yr)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.50E+01	8.80E+00	7.15E+00	8.93E-01	8.32E-10



Title : C-14 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14 EMC.bld

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Title : C-14 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14 EMC.bld

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=====
RESRAD-BUILD Input Parameters
=====
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```

```

Number of Sources : 1
Number of Receptors: 1
Total Time : 3.650000E+02 days
Fraction Inside : 5.000000E-01
    
```

```

===== Receptor Information =====
    
```

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	6.000	6.000	1.000	1.000	1.80E+01	1.00E-04

```

===== Receptor-Source Shielding Relationship =====
    
```

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

==== Building Information =====

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m]	Area [m2]	Air Exchanges [m3/hr]
		*****
		* * *
		* * *
		* * *
		* * * <=Q01: 7.20E+01
H1: 2.500		* Room 1 * Q10 : 7.20E+01
		* LAMBDA: 8.00E-01 * * *
Area 36.000		* * *
		*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : C-14 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14 EMC.bld

==== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00[m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::

Nuclide Concentration Dose Conversion Factor (Library: FGR 13 Morbidity)

	[dpm/m2]	Dose Conversion Factor (Library: FGR 13 Morbidity)		
		Ingestion [mrem/dpm]	Inhalation [mrem/dpm]	Submersion [mrem/yr/ (dpm/m3)]
C-14	4.100E+09	9.414E-07	9.414E-07	1.180E-08

Title : C-14 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14 EMC.bld

Evaluation Time: 0.00000000E+00 years

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=====
Assessment for Time: 1
Time =0.00E+00 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 5.000E-01

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	C-14	4.100E+09

Title : C-14 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14 EMC.bld

Evaluation Time: 0.00000000E+00 years

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=====  
RESRAD-BUILDDose Tables  
=====  
=====  
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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	1.46E+01	1.46E+01
Total	1.46E+01	1.46E+01

Title : C-14 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14 EMC.bld

Evaluation Time: 0.00000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	1.33E-01	3.49E-03	7.52E-06	3.94E+00	0.00E+00	1.05E+01
Total	1.33E-01	3.49E-03	7.52E-06	3.94E+00	0.00E+00	1.05E+01

Title : C-14 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14 EMC.bld

Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
C-14		
C-14	1.46E+01	1.46E+01



Title : C-14 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14 EMC.bld

Evaluation Time: 1.00000000 years

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Assessment for Time: 2

Time =1.00E+00 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	C-14	2.050E+09

Title : C-14 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14 EMC.bld

Evaluation Time: 1.00000000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	8.88E-02	8.88E-02
Total	8.88E-02	8.88E-02

Title : C-14 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14 EMC.bld

Evaluation Time: 1.00000000 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	8.88E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	8.88E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : C-14 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14 EMC.bld

Evaluation Time: 1.00000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
C-14		
C-14	8.88E-02	8.88E-02

Title : C-14 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14 EMC.bld

Evaluation Time: 10.0000000 years

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```

Assessment for Time: 3

Time =1.00E+01 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	C-14	2.048E+09

Title : C-14 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14 EMC.bld

Evaluation Time: 10.0000000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	8.87E-02	8.87E-02
Total	8.87E-02	8.87E-02

Title : C-14 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14 EMC.bld

Evaluation Time: 10.0000000 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	8.87E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	8.87E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : C-14 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14 EMC.bld

Evaluation Time: 10.0000000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
C-14		
C-14	8.87E-02	8.87E-02



Title : C-14 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14 EMC.bld

Evaluation Time: 100.000008 years

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Assessment for Time: 4
Time =1.00E+02 yr
=====
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```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	C-14	2.025E+09

Title : C-14 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14 EMC.bld

Evaluation Time: 100.000008 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

[mrem]

	Source	Total
	1	
Receptor 1	8.78E-02	8.78E-02
Total	8.78E-02	8.78E-02

Title : C-14 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14 EMC.bld

Evaluation Time: 100.000008 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	8.78E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	8.78E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : C-14 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14 EMC.bld

Evaluation Time: 100.000008 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
C-14		
C-14	8.78E-02	8.78E-02

Title : C-14 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14 EMC.bld

Evaluation Time: 1000.00000 years

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Assessment for Time: 5

Time =1.00E+03 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 6.00 y: 6.00 z: 0.00 [m]

Geometry:: Type: Area Area:4.00E+00 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 0.000E+00

Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration
		[dpm/m2]
	C-14	1.816E+09

Title : C-14 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14 EMC.bld

Evaluation Time: 1000.00000 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	7.87E-02	7.87E-02
Total	7.87E-02	7.87E-02

Title : C-14 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14 EMC.bld

Evaluation Time: 1000.00000 years

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor 1	7.87E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	7.87E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Title : C-14 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14 EMC.bld

Evaluation Time: 1000.00000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
C-14		
C-14	7.87E-02	7.87E-02



Title : C-14 EMC

Input File : C:\Program Files\RESRAD\_Family\BUILD\C-14 EMC.bld

Full Summary

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RESRAD-BUILD Dose (Time) Tables

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Receptor Dose Received for the Exposure Duration

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(mrem)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.46E+01	8.88E-02	8.87E-02	8.78E-02	7.87E-02

Receptor Dose/Yr Averaged Over Exposure Duration

=====

(mrem/yr)

	Evaluation Time [yr]				
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03
1	1.46E+01	8.89E-02	8.88E-02	8.78E-02	7.88E-02

# RESRAD VERSION 6.3 DATA DCGL CALCULATIONS

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## Dose Conversion Factor (and Related) Parameter Summary

File: FGR 13 MORBIDITY

Menu	Parameter	Current Value	Base Case*	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ba-133	7.810E-06	7.810E-06	DCF2( 1)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ba-133	3.400E-06	3.400E-06	DCF3( 1)
D-34	Food transfer factors:			
D-34	Ba-133 , plant/soil concentration ratio, dimensionless	5.000E-03	5.000E-03	RTF( 1,1)
D-34	Ba-133 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-04	2.000E-04	RTF( 1,2)
D-34	Ba-133 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-04	5.000E-04	RTF( 1,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Ba-133 , fish	4.000E+00	4.000E+00	BIOFAC( 1,1)
D-5	Ba-133 , crustacea and mollusks	2.000E+02	2.000E+02	BIOFAC( 1,2)

\*Base Case means Default.Lib w/o Associate Nuclide contributions.

## Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	6.000E+00	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.500E-01	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	3.000E+00	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	1.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T( 2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T( 3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T( 4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T( 5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T( 6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T( 7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T( 8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T( 9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Ba-133	6.000E+00	0.000E+00	---	S1( 1)
R012	Concentration in groundwater (pCi/L): Ba-133	not used	0.000E+00	---	W1( 1)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	4.000E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.000E-01	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	2.000E-01	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	1.000E+02	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	---	HGWT
R014	Saturated zone b parameter	5.300E+00	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	1.000E-03	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	---	UW
R015	Number of unsaturated zone strata	1	1	---	NS

## Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R015	Unsat. zone 1, thickness (m)	4.000E+00	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.500E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	4.000E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	2.000E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	2.000E-01	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	5.300E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Ba-133				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC( 1)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU( 1,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS( 1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.426E-02	ALEACH( 1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK( 1)
R017	Inhalation rate (m**3/yr)	8.400E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	3.000E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	5.000E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	2.500E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	-1.000E+00	1.000E+00	-1 shows non-circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	2.500E-01	5.000E+01	---	RAD_SHAPE( 1)
R017	Outer annular radius (m), ring 2:	5.000E-01	7.071E+01	---	RAD_SHAPE( 2)
R017	Outer annular radius (m), ring 3:	7.500E-01	0.000E+00	---	RAD_SHAPE( 3)
R017	Outer annular radius (m), ring 4:	1.000E+00	0.000E+00	---	RAD_SHAPE( 4)
R017	Outer annular radius (m), ring 5:	1.250E+00	0.000E+00	---	RAD_SHAPE( 5)
R017	Outer annular radius (m), ring 6:	1.500E+00	0.000E+00	---	RAD_SHAPE( 6)
R017	Outer annular radius (m), ring 7:	1.750E+00	0.000E+00	---	RAD_SHAPE( 7)
R017	Outer annular radius (m), ring 8:	2.000E+00	0.000E+00	---	RAD_SHAPE( 8)
R017	Outer annular radius (m), ring 9:	2.250E+00	0.000E+00	---	RAD_SHAPE( 9)
R017	Outer annular radius (m), ring 10:	2.500E+00	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	2.750E+00	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	3.000E+00	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	9.000E-01	1.000E+00	---	FRACA( 1)
R017	Ring 2	9.000E-01	2.732E-01	---	FRACA( 2)
R017	Ring 3	9.000E-01	0.000E+00	---	FRACA( 3)
R017	Ring 4	8.500E-01	0.000E+00	---	FRACA( 4)
R017	Ring 5	6.500E-01	0.000E+00	---	FRACA( 5)
R017	Ring 6	3.200E-01	0.000E+00	---	FRACA( 6)
R017	Ring 7	2.000E-01	0.000E+00	---	FRACA( 7)
R017	Ring 8	1.700E-01	0.000E+00	---	FRACA( 8)
R017	Ring 9	1.300E-01	0.000E+00	---	FRACA( 9)
R017	Ring 10	2.300E-02	0.000E+00	---	FRACA(10)
R017	Ring 11	0.000E+00	0.000E+00	---	FRACA(11)
R017	Ring 12	0.000E+00	0.000E+00	---	FRACA(12)

## Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R018	Fruits, vegetables and grain consumption (kg/yr)	1.600E+02	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	1.400E+01	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	9.200E+01	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	6.300E+01	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	5.400E+00	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	9.000E-01	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	5.100E+02	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	1.000E+00	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	1.000E+00	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	1.000E+00	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	5.000E-01	5.000E-01	---	FR9
R018	Contamination fraction of plant food	5.000E-01	-1	---	FPLANT
R018	Contamination fraction of meat	1.000E+00	-1	---	FMEAT
R018	Contamination fraction of milk	1.000E+00	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	6.800E+01	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	5.500E+01	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	1.600E+02	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	5.000E-01	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	1.000E-04	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	9.000E-01	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	1.000E+00	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	1.000E+00	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	1.000E+00	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	7.000E-01	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	1.500E+00	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	1.100E+00	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	1.700E-01	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	2.500E-01	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	8.000E-02	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	1.000E-01	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	1.000E+00	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	1.000E+00	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	2.000E+01	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR

## Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
C14	DCF correction factor for gaseous forms of C14	not used	0.000E+00	---	CO2F
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX



## Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	active
4 -- meat ingestion	active
5 -- milk ingestion	active
6 -- aquatic foods	active
7 -- drinking water	active
8 -- soil ingestion	active
9 -- radon	suppressed
Find peak pathway doses	active

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	6.00 square meters	Ba-133	6.000E+00
Thickness:	0.15 meters		
Cover Depth:	0.00 meters		

Total Dose TDOSE(t), mrem/yr

Basic Radiation Dose Limit = 1.500E+01 mrem/yr

Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	1.854E+00	1.656E+00	1.321E+00	5.983E-01	6.153E-02	1.634E-05	0.000E+00	0.000E+00
M(t):	1.236E-01	1.104E-01	8.808E-02	3.988E-02	4.102E-03	1.089E-06	0.000E+00	0.000E+00

Maximum TDOSE(t): 1.854E+00 mrem/yr at t = 0.000E+00 years

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ba-133	1.852E+00	0.9989	1.291E-06	0.0000	0.000E+00	0.0000	1.400E-03	0.0008	1.356E-04	0.0001	4.841E-04	0.0003	3.164E-06	0.0000
Total	1.852E+00	0.9989	1.291E-06	0.0000	0.000E+00	0.0000	1.400E-03	0.0008	1.356E-04	0.0001	4.841E-04	0.0003	3.164E-06	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ba-133	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.854E+00	1.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.854E+00	1.0000

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ba-133	1.654E+00	0.9989	1.150E-06	0.0000	0.000E+00	0.0000	1.248E-03	0.0008	1.208E-04	0.0001	4.314E-04	0.0003	2.819E-06	0.0000
Total	1.654E+00	0.9989	1.150E-06	0.0000	0.000E+00	0.0000	1.248E-03	0.0008	1.208E-04	0.0001	4.314E-04	0.0003	2.819E-06	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ba-133	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.656E+00	1.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.656E+00	1.0000

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ba-133	1.320E+00	0.9989	9.126E-07	0.0000	0.000E+00	0.0000	9.901E-04	0.0007	9.590E-05	0.0001	3.423E-04	0.0003	2.237E-06	0.0000
Total	1.320E+00	0.9989	9.126E-07	0.0000	0.000E+00	0.0000	9.901E-04	0.0007	9.590E-05	0.0001	3.423E-04	0.0003	2.237E-06	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ba-133	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.321E+00	1.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.321E+00	1.0000

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ba-133	5.976E-01	0.9989	4.058E-07	0.0000	0.000E+00	0.0000	4.402E-04	0.0007	4.264E-05	0.0001	1.522E-04	0.0003	9.948E-07	0.0000
Total	5.976E-01	0.9989	4.058E-07	0.0000	0.000E+00	0.0000	4.402E-04	0.0007	4.264E-05	0.0001	1.522E-04	0.0003	9.948E-07	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ba-133	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.983E-01	1.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.983E-01	1.0000

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ba-133	6.146E-02	0.9990	3.946E-08	0.0000	0.000E+00	0.0000	4.281E-05	0.0007	4.147E-06	0.0001	1.480E-05	0.0002	9.673E-08	0.0000
<b>Total</b>	<b>6.146E-02</b>	<b>0.9990</b>	<b>3.946E-08</b>	<b>0.0000</b>	<b>0.000E+00</b>	<b>0.0000</b>	<b>4.281E-05</b>	<b>0.0007</b>	<b>4.147E-06</b>	<b>0.0001</b>	<b>1.480E-05</b>	<b>0.0002</b>	<b>9.673E-08</b>	<b>0.0000</b>

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ba-133	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.153E-02	1.0000
<b>Total</b>	<b>0.000E+00</b>	<b>0.0000</b>	<b>0.000E+00</b>	<b>0.0000</b>	<b>0.000E+00</b>	<b>0.0000</b>	<b>0.000E+00</b>	<b>0.0000</b>	<b>0.000E+00</b>	<b>0.0000</b>	<b>0.000E+00</b>	<b>0.0000</b>	<b>6.153E-02</b>	<b>1.0000</b>

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ba-133	1.633E-05	0.9992	8.054E-12	0.0000	0.000E+00	0.0000	8.741E-09	0.0005	8.471E-10	0.0001	3.022E-09	0.0002	1.975E-11	0.0000
Total	1.633E-05	0.9992	8.054E-12	0.0000	0.000E+00	0.0000	8.741E-09	0.0005	8.471E-10	0.0001	3.022E-09	0.0002	1.975E-11	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ba-133	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.634E-05	1.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.634E-05	1.0000

\*Sum of all water independent and dependent pathways.



Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ba-133	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ba-133	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

\*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ba-133	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ba-133	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

\*Sum of all water independent and dependent pathways.

Dose/Source Ratios Summed Over All Pathways  
Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	1.000E+00	3.091E-01	2.760E-01	2.202E-01	9.971E-02	1.025E-02	2.723E-06	0.000E+00	0.000E+00

The DSR includes contributions from associated (half-life ≤ 180 days) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g  
Basic Radiation Dose Limit = 1.500E+01 mrem/yr

Nuclide (i)	t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133		4.854E+01	5.434E+01	6.812E+01	1.504E+02	1.463E+03	5.509E+06	*2.504E+14	*2.504E+14

\*At specific activity limit

Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)  
and Single Radionuclide Soil Guidelines G(i,t) in pCi/g  
at tmin = time of minimum single radionuclide soil guideline  
and at tmax = time of maximum total dose = 0.000E+00 years

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Ba-133	6.000E+00	0.000E+00	3.091E-01	4.854E+01	3.091E-01	4.854E+01

Individual Nuclide Dose Summed Over All Pathways  
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	1.000E+00	1.854E+00	1.656E+00	1.321E+00	5.983E-01	6.153E-02	1.634E-05	0.000E+00	0.000E+00

THF(i) is the thread fraction of the parent nuclide.

Individual Nuclide Soil Concentration  
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	1.000E+00	6.000E+00	5.381E+00	4.329E+00	2.021E+00	2.295E-01	1.131E-04	4.014E-14	0.000E+00

THF(i) is the thread fraction of the parent nuclide.

RESCALC.EXE execution time = 2.83 seconds

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Iteration Log for Computation of the Time of Maximum Ba-133 Dose/Source Ratio  
 Pathway: Water

Tolerance for tmax = 1.0E-03 (fractional accuracy)

Iteration Number	t (years)	DSR(t) (mrem/yr)/(pCi/g)	Step Size (years)	Step Type
0	3.45511E+02	1.76532E-14		
1	2.25831E+02	0.00000E+00	-1.19679E+02	parabolic
2	3.38246E+02	2.09904E-14	-7.26450E+00	parabolic
3	2.95308E+02	0.00000E+00	-4.29386E+01	golden section
4	3.21845E+02	0.00000E+00	-1.64011E+01	golden section
5	3.31982E+02	1.85877E-14	-6.26466E+00	golden section
6	3.37908E+02	2.10436E-14	-5.43731E-02	parabolic
7	3.37214E+02	2.11059E-14	-6.93480E-01	parabolic
8	3.35216E+02	2.08614E-14	-1.99879E+00	golden section
9	3.36876E+02	2.11115E-14	-3.38173E-01	parabolic
10	3.36539E+02	2.10995E-14	-3.36876E-01	parabolic
11	3.36876E+02	2.11115E-14	0.00000E+00	direct

Notes:

- 1) Step size always from t with current largest DSR(t) .
- 2) Parabolic step based on parabola maximum through the current best triplet.
- 3) Golden section step,  $0.5 \cdot (3 - \sqrt{5})$  of larger interval bracketing maximum, taken only if trial parabolic step fails.
- 4) Direct step to a previous t only on last iteration and only if prior iteration met convergence test but DSR(t) was smaller than the previous value.

Iteration Log for Computation of the Time of Maximum Ba-133 Dose/Source Ratio  
Pathway: Fish

Tolerance for tmax = 1.0E-03 (fractional accuracy)

Iteration Number	t (years)	DSR(t) (mrem/yr)/(pCi/g)	Step Size (years)	Step Type
0	3.45511E+02	1.74364E-18		
1	2.25831E+02	0.00000E+00	-1.19679E+02	parabolic
2	3.38246E+02	2.07227E-18	-7.26449E+00	parabolic
3	2.95308E+02	0.00000E+00	-4.29386E+01	golden section
4	3.21845E+02	0.00000E+00	-1.64011E+01	golden section
5	3.31982E+02	1.83273E-18	-6.26466E+00	golden section
6	3.37908E+02	2.07746E-18	-3.36894E-02	parabolic
7	3.37229E+02	2.08339E-18	-6.78816E-01	parabolic
8	3.35225E+02	2.05897E-18	-2.00440E+00	golden section
9	3.36892E+02	2.08392E-18	-3.33390E-01	parabolic
10	3.36555E+02	2.08272E-18	-3.36892E-01	parabolic
11	3.36892E+02	2.08392E-18	0.00000E+00	direct

Notes:

- 1) Step size always from t with current largest DSR(t) .
- 2) Parabolic step based on parabola maximum through the current best triplet.
- 3) Golden section step,  $0.5*(3-\text{SQRT}(5))$  of larger interval bracketing maximum, taken only if trial parabolic step fails.
- 4) Direct step to a previous t only on last iteration and only if prior iteration met convergence test but DSR(t) was smaller than the previous value.



Iteration Log for Computation of the Time of Maximum Ba-133 Dose/Source Ratio  
Pathway: Plant (water dependent)

Tolerance for tmax = 1.0E-03 (fractional accuracy)

Iteration Number	t (years)	DSR(t) (mrem/yr)/(pCi/g)	Step Size (years)	Step Type
0	3.45511E+02	1.35764E-15		
1	2.25831E+02	0.00000E+00	-1.19679E+02	parabolic
2	3.38246E+02	1.61299E-15	-7.26449E+00	parabolic
3	2.95308E+02	0.00000E+00	-4.29386E+01	golden section
4	3.21845E+02	0.00000E+00	-1.64011E+01	golden section
5	3.31982E+02	1.42527E-15	-6.26466E+00	golden section
6	3.37908E+02	1.61699E-15	-1.94047E-02	parabolic
7	3.37239E+02	1.62148E-15	-6.68676E-01	parabolic
8	3.35231E+02	1.60233E-15	-2.00827E+00	golden section
9	3.36902E+02	1.62189E-15	-3.29905E-01	parabolic
10	3.36565E+02	1.62094E-15	-3.36902E-01	parabolic
11	3.36902E+02	1.62189E-15	0.00000E+00	direct

Notes:

- 1) Step size always from t with current largest DSR(t) .
- 2) Parabolic step based on parabola maximum through the current best triplet.
- 3) Golden section step,  $0.5 \cdot (3 - \sqrt{5})$  of larger interval bracketing maximum, taken only if trial parabolic step fails.
- 4) Direct step to a previous t only on last iteration and only if prior iteration met convergence test but DSR(t) was smaller than the previous value.

Iteration Log for Computation of the Time of Maximum Ba-133 Dose/Source Ratio  
Pathway: Meat (water dependent)

Tolerance for tmax = 1.0E-03 (fractional accuracy)

Iteration Number	t (years)	DSR(t) (mrem/yr)/(pCi/g)	Step Size (years)	Step Type
0	3.45511E+02	7.52648E-17		
1	2.25831E+02	0.00000E+00	-1.19679E+02	parabolic
2	3.38246E+02	8.91234E-17	-7.26446E+00	parabolic
3	2.95308E+02	0.00000E+00	-4.29386E+01	golden section
4	3.21845E+02	0.00000E+00	-1.64011E+01	golden section
5	3.31982E+02	7.80400E-17	-6.26466E+00	golden section
6	3.38584E+02	8.88652E-17	1.22532E-01	parabolic
7	3.37420E+02	8.94932E-17	-8.26012E-01	parabolic
8	3.35343E+02	8.84311E-17	-2.07737E+00	golden section
9	3.37007E+02	8.95256E-17	-4.12865E-01	parabolic
10	3.36670E+02	8.94692E-17	-3.37007E-01	parabolic
11	3.37007E+02	8.95256E-17	0.00000E+00	direct

- Notes:
- 1) Step size always from t with current largest DSR(t) .
  - 2) Parabolic step based on parabola maximum through the current best triplet.
  - 3) Golden section step,  $0.5*(3-\text{SQRT}(5))$  of larger interval bracketing maximum, taken only if trial parabolic step fails.
  - 4) Direct step to a previous t only on last iteration and only if prior iteration met convergence test but DSR(t) was smaller than the previous value.

Iteration Log for Computation of the Time of Maximum Ba-133 Dose/Source Ratio  
 Pathway: Milk (water dependent)

Tolerance for tmax = 1.0E-03 (fractional accuracy)

Iteration Number	t (years)	DSR(t) (mrem/yr)/(pCi/g)	Step Size (years)	Step Type
0	3.45511E+02	4.12969E-16		
1	2.25831E+02	0.00000E+00	-1.19679E+02	parabolic
2	3.38246E+02	4.90327E-16	-7.26448E+00	parabolic
3	2.95308E+02	0.00000E+00	-4.29386E+01	golden section
4	3.21845E+02	0.00000E+00	-1.64011E+01	golden section
5	3.31982E+02	4.32507E-16	-6.26466E+00	golden section
6	3.38584E+02	4.88811E-16	8.48834E-03	parabolic
7	3.37336E+02	4.92731E-16	-9.09822E-01	parabolic
8	3.35291E+02	4.87245E-16	-2.04536E+00	golden section
9	3.36895E+02	4.92923E-16	-4.41817E-01	parabolic
10	3.36558E+02	4.92597E-16	-3.36895E-01	parabolic
11	3.36895E+02	4.92923E-16	0.00000E+00	direct

Notes:

- 1) Step size always from t with current largest DSR(t) .
- 2) Parabolic step based on parabola maximum through the current best triplet.
- 3) Golden section step,  $0.5 \cdot (3 - \sqrt{5})$  of larger interval bracketing maximum, taken only if trial parabolic step fails.
- 4) Direct step to a previous t only on last iteration and only if prior iteration met convergence test but DSR(t) was smaller than the previous value.

Iteration Log for Computation of the Time of Maximum Total Dose  
Pathway: Water

Tolerance for tmax = 1.0E-03 (fractional accuracy)

Iteration Number	t (years)	TDOSE(t) (mrem/yr)	Step Size (years)	Step Type
0	3.45511E+02	1.05919E-13		
1	2.25831E+02	0.00000E+00	-1.19679E+02	parabolic
2	3.38246E+02	1.25942E-13	-7.26450E+00	parabolic
3	2.95308E+02	0.00000E+00	-4.29386E+01	golden section
4	3.21845E+02	0.00000E+00	-1.64011E+01	golden section
5	3.31982E+02	1.11526E-13	-6.26466E+00	golden section
6	3.37908E+02	1.26262E-13	-5.43734E-02	parabolic
7	3.37214E+02	1.26636E-13	-6.93481E-01	parabolic
8	3.35216E+02	1.25169E-13	-1.99879E+00	golden section
9	3.36876E+02	1.26669E-13	-3.38216E-01	parabolic
10	3.36539E+02	1.26597E-13	-3.36876E-01	parabolic
11	3.36876E+02	1.26669E-13	0.00000E+00	direct

Notes:

- 1) Step size always from t with current largest TDOSE(t).
- 2) Parabolic step based on parabola maximum through the current best triplet.
- 3) Golden section step,  $0.5*(3-\text{SQRT}(5))$  of larger interval bracketing maximum, taken only if trial parabolic step fails.
- 4) Direct step to a previous t only on last iteration and only if prior iteration met convergence test but TDOSE(t) was smaller than the previous value.

Iteration Log for Computation of the Time of Maximum Total Dose  
Pathway: Fish

Tolerance for tmax = 1.0E-03 (fractional accuracy)

Iteration Number	t (years)	TDOSE(t) (mrem/yr)	Step Size (years)	Step Type
0	3.45511E+02	1.04618E-17		
1	2.25831E+02	0.00000E+00	-1.19679E+02	parabolic
2	3.38246E+02	1.24336E-17	-7.26449E+00	parabolic
3	2.95308E+02	0.00000E+00	-4.29386E+01	golden section
4	3.21845E+02	0.00000E+00	-1.64011E+01	golden section
5	3.31982E+02	1.09964E-17	-6.26466E+00	golden section
6	3.37908E+02	1.24648E-17	-3.36890E-02	parabolic
7	3.37229E+02	1.25003E-17	-6.78824E-01	parabolic
8	3.35225E+02	1.23538E-17	-2.00439E+00	golden section
9	3.36892E+02	1.25035E-17	-3.33195E-01	parabolic
10	3.36555E+02	1.24963E-17	-3.36892E-01	parabolic
11	3.36892E+02	1.25035E-17	0.00000E+00	direct

Notes:

- 1) Step size always from t with current largest TDOSE(t).
- 2) Parabolic step based on parabola maximum through the current best triplet.
- 3) Golden section step,  $0.5*(3-\text{SQRT}(5))$  of larger interval bracketing maximum, taken only if trial parabolic step fails.
- 4) Direct step to a previous t only on last iteration and only if prior iteration met convergence test but TDOSE(t) was smaller than the previous value.

Iteration Log for Computation of the Time of Maximum Total Dose  
Pathway: Plant (water dependent)

Tolerance for tmax = 1.0E-03 (fractional accuracy)

Iteration Number	t (years)	TDOSE(t) (mrem/yr)	Step Size (years)	Step Type
0	3.45511E+02	8.14583E-15		
1	2.25831E+02	0.00000E+00	-1.19679E+02	parabolic
2	3.38246E+02	9.67796E-15	-7.26449E+00	parabolic
3	2.95308E+02	0.00000E+00	-4.29386E+01	golden section
4	3.21845E+02	0.00000E+00	-1.64011E+01	golden section
5	3.31982E+02	8.55163E-15	-6.26466E+00	golden section
6	3.37908E+02	9.70193E-15	-1.94042E-02	parabolic
7	3.37239E+02	9.72889E-15	-6.68676E-01	parabolic
8	3.35231E+02	9.61400E-15	-2.00827E+00	golden section
9	3.36902E+02	9.73132E-15	-3.29929E-01	parabolic
10	3.36565E+02	9.72567E-15	-3.36902E-01	parabolic
11	3.36902E+02	9.73132E-15	0.00000E+00	direct

Notes:

- 1) Step size always from t with current largest TDOSE(t).
- 2) Parabolic step based on parabola maximum through the current best triplet.
- 3) Golden section step,  $0.5 \cdot (3 - \sqrt{5})$  of larger interval bracketing maximum, taken only if trial parabolic step fails.
- 4) Direct step to a previous t only on last iteration and only if prior iteration met convergence test but TDOSE(t) was smaller than the previous value.

Iteration Log for Computation of the Time of Maximum Total Dose  
Pathway: Meat (water dependent)

Tolerance for tmax = 1.0E-03 (fractional accuracy)

Iteration Number	t (years)	TDOSE(t) (mrem/yr)	Step Size (years)	Step Type
0	3.45511E+02	4.51589E-16		
1	2.25831E+02	0.00000E+00	-1.19679E+02	parabolic
2	3.38246E+02	5.34740E-16	-7.26446E+00	parabolic
3	2.95308E+02	0.00000E+00	-4.29386E+01	golden section
4	3.21845E+02	0.00000E+00	-1.64011E+01	golden section
5	3.31982E+02	4.68240E-16	-6.26466E+00	golden section
6	3.38584E+02	5.33191E-16	1.22533E-01	parabolic
7	3.37420E+02	5.36959E-16	-8.26018E-01	parabolic
8	3.35343E+02	5.30587E-16	-2.07737E+00	golden section
9	3.37007E+02	5.37154E-16	-4.12848E-01	parabolic
10	3.36670E+02	5.36815E-16	-3.37007E-01	parabolic
11	3.37007E+02	5.37154E-16	0.00000E+00	direct

Notes:

- 1) Step size always from t with current largest TDOSE(t).
- 2) Parabolic step based on parabola maximum through the current best triplet.
- 3) Golden section step,  $0.5 \cdot (3 - \sqrt{5})$  of larger interval bracketing maximum, taken only if trial parabolic step fails.
- 4) Direct step to a previous t only on last iteration and only if prior iteration met convergence test but TDOSE(t) was smaller than the previous value.

Iteration Log for Computation of the Time of Maximum Total Dose  
Pathway: Milk (water dependent)

Tolerance for tmax = 1.0E-03 (fractional accuracy)

Iteration Number	t (years)	TDOSE(t) (mrem/yr)	Step Size (years)	Step Type
0	3.45511E+02	2.47781E-15		
1	2.25831E+02	0.00000E+00	-1.19679E+02	parabolic
2	3.38246E+02	2.94196E-15	-7.26448E+00	parabolic
3	2.95308E+02	0.00000E+00	-4.29386E+01	golden section
4	3.21845E+02	0.00000E+00	-1.64011E+01	golden section
5	3.31982E+02	2.59504E-15	-6.26466E+00	golden section
6	3.38584E+02	2.93287E-15	8.48809E-03	parabolic
7	3.37336E+02	2.95638E-15	-9.09813E-01	parabolic
8	3.35291E+02	2.92347E-15	-2.04536E+00	golden section
9	3.36895E+02	2.95754E-15	-4.41842E-01	parabolic
10	3.36558E+02	2.95558E-15	-3.36895E-01	parabolic
11	3.36895E+02	2.95754E-15	0.00000E+00	direct

Notes:

- 1) Step size always from t with current largest TDOSE(t).
- 2) Parabolic step based on parabola maximum through the current best triplet.
- 3) Golden section step,  $0.5*(3-\text{SQRT}(5))$  of larger interval bracketing maximum, taken only if trial parabolic step fails.
- 4) Direct step to a previous t only on last iteration and only if prior iteration met convergence test but TDOSE(t) was smaller than the previous value.



Source Factors for Ingrowth and Decay  
Radioactivity Factors Only  
Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	ID(j,t) = THF(j)*S1(j,t)/S1(i,0) At Time in Years							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	1.000E+00	1.000E+00	9.375E-01	8.240E-01	5.245E-01	1.443E-01	1.574E-03	3.902E-09	9.357E-29

Source Factors for Ingrowth and Decay  
Combined Radioactivity and Leaching Factors  
Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	SF(j,t) = THF(j)*S1(j,t)/S1(i,0) At Time in Years							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	1.000E+00	1.000E+00	8.969E-01	7.215E-01	3.369E-01	3.824E-02	1.884E-05	6.690E-15	0.000E+00

The effect of volatilization was also considered when computing the source factors for H-3 and C-14.

Parameters Used for Calculating Cover Depth and Contaminated Zone Thicknesses

Cover Erosion rate (vcv): 0.001000 m/yr  
 Contaminated Zone Erosion rate (vcz): 0.001000 m/yr  
 Water Table Drop rate (vwt): 0.001000 m/yr  
 Precipitation rate (Pr): 1.000000 m/yr  
 Cover Removal Time (Tc): 0.000E+00 yr  
 Overhead irrigation rate (Irr): 0.200 m/yr      Runoff coefficient (Cr): 0.200  
 Evapotranspiration coeff. (Ce): 0.500      Infiltration rate (In): 0.500 m/yr  
 Bulk soil density (rhob): 1.500 g/cm\*\*3      Effective porosity (pe): 0.000

Radio-nuclide (i)	Distribution Coefficient Kd(i), cm**3/g	Leaching Ratio q(i)
Ba-133	5.000000E+01	4.261E-03

Time Dependence of Source Geometry

Time Dependence of Cover Depth [Cd(i,t)]

Nuclide (i)	t=	Cd(i,t) (meters)							
		0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133		0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

Time Dependence of Contaminated Zone Thicknesses [T(i,t)]

Nuclide (i)	t=	T(i,t) (meters)							
		0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133		1.5000E-01	1.4900E-01	1.4700E-01	1.4000E-01	1.2000E-01	5.0000E-02	0.0000E+00	0.0000E+00

Occupancy, Cover/Depth, and Area Factors for Ground Pathway

Occupancy Factor (FO1): 0.600  
 Area (A): 6. sq. meters  
 Initial cover depth (Cd): 0.000 meters  
 Initial contaminated zone thickness (T): 0.150 meters

Time Dependence of Cover/Depth Factor [FCTR\_COV\_DEPTH(i,t)]

Nuclide (i)	FCTR_COV_DEPTH(i,t) (dimensionless)								
	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	
Ba-133	9.276E-01	9.263E-01	9.238E-01	9.142E-01	8.796E-01	6.056E-01	0.000E+00	0.000E+00	

Time Dependence of Area Factor [FCTR\_AREA(i,t)]

Nuclide (i)	FCTR_AREA(i,t) (dimensionless)								
	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	
Ba-133	2.963E-01	2.954E-01	2.938E-01	2.879E-01	2.713E-01	2.139E-01	1.000E+00	1.000E+00	

Dose Conversion and Environmental Transport Factors for the Ground Pathway (p=1)

Nuclide (i)	DCF(i,1)*	ETFG(i,t) At Time in Years (dimensionless)								
		t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	
Ba-133	1.980E+00	1.649E-01	1.642E-01	1.628E-01	1.579E-01	1.432E-01	7.774E-02	0.000E+00	0.000E+00	

\* - Units are (mrem/yr)/(pCi/g) at infinite depth and area. Multiplication by ETFG(i,t) converts to site conditions.

Dose/Source Ratios for External Radiation from the Ground (p=1)  
 Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,1,t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	1.000E+00	3.087E-01	2.757E-01	2.200E-01	9.960E-02	1.024E-02	2.721E-06	0.000E+00	0.000E+00

The DSR includes contributions from associated (half-life ≤ 180 days) daughters.

Dose/Source Ratios for Inhalation Pathway, Excluding Radon (p=2)  
 Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,2,t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	1.000E+00	2.151E-07	1.917E-07	1.521E-07	6.763E-08	6.576E-09	1.342E-12	0.000E+00	0.000E+00

The DSR includes contributions from associated (half-life ≤ 180 days) daughters.

Pathway Factors for the Inhalation Pathway (radon excluded)

Area (A): 6.0000E+00 m\*\*2      Occupancy Factor (FO2): 4.5000E-01  
 Area Factor (FA2): 7.7156E-02      Annual Air Intake (F12): 8.4000E+03 m\*\*3/yr  
 Cover Depth [Cd(0)]: 0.0000E+00 m      Mass Loading (ASR2): 1.0000E-04 g/m\*\*3  
 Contaminated Zone Thickness [T(0)]: 1.5000E-01 m      FA2 \* FO2 \* F12 \* ASR2: 2.9165E-02 g/yr

Nuclide (i)	t=	Depth Factor [FD(i,2,t)] (dimensionless)							
		0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	1.0000E+00	9.9333E-01	9.8000E-01	9.3333E-01	8.0000E-01	3.3333E-01	0.0000E+00	0.0000E+00	

Dose Conversion and Environmental Transport Factors for the Inhalation Pathway, Excluding Radon (p=2)

Parent (i)	Product (j)	DCF(j,2)*	ETF(j,2,t) At Time in Years (g/yr)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	7.810E-06	2.916E-02	2.897E-02	2.858E-02	2.722E-02	2.333E-02	9.722E-03	0.000E+00	0.000E+00

\* - The dose conversion factor units are mrem/pCi.

Transport Time Parameters for Unsaturated Zone Stratum No. 1

Stratum thickness [h(1)]:            4.000000 m  
 Bulk soil material density [rhob(1)]:    1.500000 g/cm\*\*3  
     Effective porosity [peuz(1)]:        0.200000  
     Hydraulic conductivity [Khuz(1)]:    10.000000 m/yr  
     Total porosity [ptuz(1)]:            0.400000  
 Soil specific b parameter [buz(1)]:    5.300000  
     Saturation ratio [sruz(1)]:         0.802299

Radio-nuclide (i)	Distribution Coefficient Kduz(i,1), cm**3/g	Retardation Factor Rduz(i,1)	Transport Time Dtuz(i,1), yr
Ba-133	5.0000E+01	2.3470E+02	3.0128E+02

Transport Time Parameters for Unsaturated Zone created by the Falling Water Table

Water table drop rate [vwt]:            0.001000 m/yr  
 Bulk soil material density [rhobaq]:    1.500000 g/cm\*\*3  
     Effective porosity [peaq]:            0.200000  
     Hydraulic conductivity [Khaq]:       100.000000 m/yr  
     Total porosity [ptaq]:                0.400000  
 Soil specific b parameter [baq]:        5.300000  
     Saturation ratio [sruaq]:            0.677340

Radio-nuclide (i)	Distribution Coefficient Kdaq(i), cm**3/g	Retardation Factor Rduaq(i)	Minimum Transport Time Dtuaq(i), yr
Ba-133	5.0000E+01	2.7782E+02	2.4524E+01

Dilution Factor and Rise Time Parameters for Nondispersion (ND) Model

Aquifer contamination depth at well (z): 7.50000E-01 m  
 Depth of water intake below water table (dw): 1.00000E+01 m  
     Infiltration rate (In): 5.00000E-01 m/yr  
     Aquifer water flow rate (Vwfr): 2.00000E+00 m/yr  
     Hydraulic gradient (J): 2.00000E-02  
 Hydraulic conductivity of aquifer (Kszh): 1.00000E+02 m/yr  
 Contaminated zone extent parallel to gradient (l): 3.00000E+00 m  
 Distance below contaminated zone to water table (h): 0.40000E+01 m  
 Initial thickness of uncontaminated cover (Cd): 0.00000E+00 m  
 Initial thickness of contaminated zone (T): 0.15000E+00 m  
 Effective porosity of saturated zone (pesz): 0.20000E+00

Radio-nuclide (i)	Dilution Factor f(i)	Retardation Factor Rdsz(i)	Horizontal Transport Time Onsite Tauh(i), yr	Rise Time dt(i), yr	Decay Time Parameter 1/lamda(i), yr
Ba-133	1.200E-02	1.885E+02	5.655E+01	5.655E+01	1.549E+01

Primary Parameters Used for Calculating Water/Soil Concentration Ratios for Groundwater Pathway Segment

Model used: Nondispersion (ND)

Bulk soil density in contaminated zone (rhob): 1.500 g/cm\*\*3

Radio-nuclide (i)	Dilution Factor f(i)	Retardation Factor Rdcz(i)	Breakthrough Time Chain year	Single Nuclide Dt(i), yr	Rise Time dt(i), yr
Ba-133	1.200E-02	2.347E+02	3.258E+02	3.258E+02	5.655E+01



Storage Times For Contaminated Foodstuffs

k	Food Item	STOR_T(k), days
1	non-leafy plants	14.
2	leafy plants	1.
3	milk	1.
4	meat	20.
5	fish	7.
6	crustacea	7.
7	well water	1.
8	surface water	1.
9	livestock fodder	45.

Storage Time Ingrowth and Decay Factors

Storage Time for k'th Foodstuff:  $t = \text{STOR\_T}(k)$ , days

Parent (i)	Product (j)	Thread Fraction	STOR_ID(i,j,t) = CONCE(i,j,t)/CONCE(i,i,0)								
			t= 1.400E+01	1.000E+00	1.000E+00	2.000E+01	7.000E+00	7.000E+00	1.000E+00	1.000E+00	4.500E+01
Ba-133	Ba-133	1.000E+00	9.975E-01	9.998E-01	9.998E-01	9.965E-01	9.988E-01	9.988E-01	9.998E-01	9.998E-01	9.921E-01

CONCE(i,j,t)/CONCE(i,i,0) is the concentration ratio of Product(j) at time t to Parent(i) at start of storage time.



Storage Time Correction Factors

Drinking Water from Well and/or Surface

Harvest Time = t - 2.74E-03 yr; Consumption Time = t yr

Parent (i)	Product (j)	Thread Fraction	CFWW(j,t,1)# At Time in Years							
Ba-133	Ba-133	1.000E+00	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03

#Correction factor = (concentration in media at consumption time)/(concentration at harvest time).

Storage Time Correction Factors

Irrigation Water for Nonleafy Plants from Well and/or Surface

Harvest Time = t - 4.11E-02 yr; Consumption Time = t - 3.83E-02 yr

Parent (i)	Product (j)	Thread Fraction	CFWW(j,t,2)# At Time in Years							
Ba-133	Ba-133	1.000E+00	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03

#Correction factor = (concentration in media at consumption time)/(concentration at harvest time).

Storage Time Correction Factors

Irrigation Water for Leafy Plants from Well and/or Surface

Harvest Time = t - 5.48E-03 yr; Consumption Time = t - 2.74E-03 yr

Parent (i)	Product (j)	Thread Fraction	CFWW(j,t,3)# At Time in Years							
Ba-133	Ba-133	1.000E+00	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03

#Correction factor = (concentration in media at consumption time)/(concentration at harvest time).

Storage Time Correction Factors

Irrigation Water for Livestock (Milk) Fodder from Well and/or Surface

Harvest Time = t - 1.29E-01 yr; Consumption Time = t - 1.26E-01 yr

Parent (i)	Product (j)	Thread Fraction	CFWW(j,t,5)# At Time in Years							
Ba-133	Ba-133	1.000E+00	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03

#Correction factor = (concentration in media at consumption time)/(concentration at harvest time).

Storage Time Correction Factors

Irrigation Water for Livestock (Meat) Fodder from Well and/or Surface

Harvest Time = t - 1.81E-01 yr; Consumption Time = t - 1.78E-01 yr

Parent (i)	Product (j)	Thread Fraction	CFWW(j,t,7)# At Time in Years							
Ba-133	Ba-133	1.000E+00	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03

#Correction factor = (concentration in media at consumption time)/(concentration at harvest time).

Storage Time Correction Factors

Livestock (Milk) Water from Well and/or Surface

Harvest Time = t - 5.48E-03 yr; Consumption Time = t - 2.74E-03 yr

Parent (i)	Product (j)	Thread Fraction	CFWW(j,t,4)# At Time in Years							
Ba-133	Ba-133	1.000E+00	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03

#Correction factor = (concentration in media at consumption time)/(concentration at harvest time).

Storage Time Correction Factors

Livestock (Meat) Water from Well and/or Surface

Harvest Time = t - 5.75E-02 yr; Consumption Time = t - 5.48E-02 yr

Parent (i)	Product (j)	Thread Fraction	CFWW(j,t,6)# At Time in Years							
Ba-133	Ba-133	1.000E+00	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03

#Correction factor = (concentration in media at consumption time)/(concentration at harvest time).

Storage Time Correction Factors for Nonleafy Plants

Harvest Time = t - 3.83E-02 yr; Consumption Time = t yr

Parent (i)	Product (j)	Thread Fraction	CF3(j,1,t)# At Time in Years							
Ba-133	Ba-133	1.000E+00	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03

#Correction factor = (concentration in media at consumption time)/(concentration at harvest time).

Storage Time Correction Factors for Leafy Plants

Harvest Time = t - 2.74E-03 yr; Consumption Time = t yr

Parent (i)	Product (j)	Thread Fraction	CF3(j,2,t)# At Time in Years							
Ba-133	Ba-133	1.000E+00	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03

Storage Time Correction Factors for Leafy Plants

Harvest Time = t - 2.74E-03 yr; Consumption Time = t yr

Parent (i)	Product (j)	Thread Fraction	CF3(j,2,t)# At Time in Years							
Ba-133	Ba-133	1.000E+00	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03

#Correction factor = (concentration in media at consumption time)/(concentration at harvest time).

Storage Time Correction Factors for Livestock (Meat) Fodder

Harvest Time = t - 1.78E-01 yr; Consumption Time = t - 5.48E-02 yr

Parent (i)	Product (j)	Thread Fraction	CFLF(j,1,t)# At Time in Years							
Ba-133	Ba-133	1.000E+00	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03

#Correction factor = (concentration in media at consumption time)/(concentration at harvest time).

Storage Time Correction Factors for Livestock (Milk) Fodder

Harvest Time = t - 1.26E-01 yr; Consumption Time = t - 2.74E-03 yr

Parent (i)	Product (j)	Thread Fraction	CFLF(j,2,t)# At Time in Years							
Ba-133	Ba-133	1.000E+00	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03

#Correction factor = (concentration in media at consumption time)/(concentration at harvest time).

Storage Time Correction Factors for Meat

Harvest Time = t - 5.48E-02 yr; Consumption Time = t yr

Parent (i)	Product (j)	Thread Fraction	CF45(j,1,t)# At Time in Years							
Ba-133	Ba-133	1.000E+00	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03

#Correction factor = (concentration in media at consumption time)/(concentration at harvest time).

Storage Time Correction Factors for Milk

Harvest Time = t - 2.74E-03 yr; Consumption Time = t yr

Parent (i)	Product (j)	Thread Fraction	CF45(j,2,t)# At Time in Years							
Ba-133	Ba-133	1.000E+00	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03

#Correction factor = (concentration in media at consumption time)/(concentration at harvest time).

## Storage Time Correction Factors for Fish &amp; Crustacea

Harvest Time = t - 1.92E-02 yr; Consumption Time = t yr

Parent (i)	Product (j)	Thread Fraction	CFF(j,1,t)# At Time in Years							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	1.000E+00	1.000E+00	9.988E-01	9.988E-01	9.988E-01	9.988E-01	9.988E-01	9.988E-01	9.988E-01

#Correction factor = (concentration in media at consumption time)/(concentration at harvest time).



Area and Depth Factors for Plant (p=3), Meat (p=4), and Milk (p=5) Pathways  
Overhead Irrigation (q=4)

Area Factor for Plant Foods [FA(3)] = 0.50

The Depth Factor Value

$FD(i,p,q,t) = 1.0000E+00$

is applicable for all radionuclides(i) and times(t).

Area and Depth Factors for Meat (p=4) and Milk (p=5) Pathways  
Transfer from Livestock Water (q=5) and Soil (q=6) Intake

Area Factor for Meat and Milk [FA(p),p=4,5] = 1.00

The livestock water subpathway (q=5) and livestock soil intake subpathway (q=6)  
occur only for the meat (p=4) and milk (p=5) pathways.

Dose Conversion and Environmental Transport Factors for the Plant Food Pathway (p=3)  
 Subpathway: Root Uptake from Contaminated Soil (q=1)

Parent (i)	Product (j)	DCF(j,3)*	ETF(j,3,1,t) At Time in Years (g/yr)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	3.400E-06	7.250E+01	6.471E+01	5.136E+01	2.284E+01	2.222E+00	4.564E-04	0.000E+00	0.000E+00

\* - The dose conversion factor units are mrem/pCi.

Dose Conversion and Environmental Transport Factors for the Plant Food Pathway (p=3)  
 Subpathway: Foliar Uptake from Contaminated Dust (q=2)

Parent (i)	Product (j)	DCF(j,3)*	ETF(j,3,2,t) At Time in Years (g/yr)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	3.400E-06	4.779E-02	4.264E-02	3.384E-02	1.505E-02	1.464E-03	3.007E-07	0.000E+00	0.000E+00

\* - The dose conversion factor units are mrem/pCi.

Dose Conversion and Environmental Transport Factors for the Plant Food Pathway (p=3)  
 Subpathway: Ditch Irrigation (q=3)

Parent (i)	Product (j)	DCF(j,3)*	ETF(j,3,3,t) * SF(j,t) At Time in Years (g/yr)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	3.400E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\* - The dose conversion factor units are mrem/pCi.

Dose Conversion and Environmental Transport Factors for the Plant Food Pathway (p=3)  
 Subpathway: Overhead Irrigation (q=4)

Parent (i)	Product (j)	DCF(j,3)*	ETF(j,3,4,t) * SF(j,t) At Time in Years (g/yr)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	3.400E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\* - The dose conversion factor units are mrem/pCi.

Dose Conversion and Environmental Transport Factors for the Meat Pathway (p=4)

Subpathway: Fodder Root Uptake from Contaminated Soil (q=1)

Parent (i)	Product (j)	DCF(j,4)*	ETF(j,4,1,t) At Time in Years (g/yr)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	3.400E-06	7.140E-01	6.419E-01	5.095E-01	2.266E-01	2.205E-02	4.536E-06	0.000E+00	0.000E+00

\* - The dose conversion factor units are mrem/pCi.

Dose Conversion and Environmental Transport Factors for the Meat Pathway (p=4)

Subpathway: Fodder Foliar Uptake from Contaminated Dust (q=2)

Parent (i)	Product (j)	DCF(j,4)*	ETF(j,4,2,t) At Time in Years (g/yr)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	3.400E-06	1.895E-03	1.703E-03	1.352E-03	6.012E-04	5.851E-05	1.204E-08	0.000E+00	0.000E+00

\* - The dose conversion factor units are mrem/pCi.

Dose Conversion and Environmental Transport Factors for the Meat Pathway (p=4)

Subpathway: Ditch Irrigation (q=3)

Parent (i)	Product (j)	DCF(j,4)*	ETF(j,4,3,t) * SF(j,t) At Time in Years (g/yr)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	3.400E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\* - The dose conversion factor units are mrem/pCi.

Dose Conversion and Environmental Transport Factors for the Meat Pathway (p=4)

Subpathway: Overhead Irrigation (q=4)

Parent (i)	Product (j)	DCF(j,4)*	ETF(j,4,4,t) * SF(j,t) At Time in Years (g/yr)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	3.400E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\* - The dose conversion factor units are mrem/pCi.

Dose Conversion and Environmental Transport Factors for the Meat Pathway (p=4)

Subpathway: Livestock Water (q=5)

Parent (i)	Product (j)	DCF(j,4)*	ETF(j,4,5,t) * SF(j,t) At Time in Years (g/yr)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	3.400E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\* - The dose conversion factor units are mrem/pCi.



Dose Conversion and Environmental Transport Factors for the Milk Pathway (p=5)  
 Subpathway: Fodder Root Uptake from Contaminated Soil (q=1)

Parent (i)	Product (j)	DCF(j,5)*	ETF(j,5,1,t) At Time in Years (g/yr)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	3.400E-06	2.108E+00	1.890E+00	1.500E+00	6.673E-01	6.493E-02	1.335E-05	0.000E+00	0.000E+00

\* - The dose conversion factor units are mrem/pCi.

Dose Conversion and Environmental Transport Factors for the Milk Pathway (p=5)  
 Subpathway: Fodder Foliar Uptake from Contaminated Dust (q=2)

Parent (i)	Product (j)	DCF(j,5)*	ETF(j,5,2,t) At Time in Years (g/yr)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	3.400E-06	5.594E-03	5.016E-03	3.981E-03	1.771E-03	1.723E-04	3.542E-08	0.000E+00	0.000E+00

\* - The dose conversion factor units are mrem/pCi.

Dose Conversion and Environmental Transport Factors for the Milk Pathway (p=5)  
 Subpathway: Ditch Irrigation (q=3)

Parent (i)	Product (j)	DCF(j,5)*	ETF(j,5,3,t) * SF(j,t) At Time in Years (g/yr)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	3.400E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\* - The dose conversion factor units are mrem/pCi.

Dose Conversion and Environmental Transport Factors for the Milk Pathway (p=5)  
 Subpathway: Overhead Irrigation (q=4)

Parent (i)	Product (j)	DCF(j,5)*	ETF(j,5,4,t) * SF(j,t) At Time in Years (g/yr)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	3.400E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\* - The dose conversion factor units are mrem/pCi.

Dose Conversion and Environmental Transport Factors for the Milk Pathway (p=5)  
 Subpathway: Livestock Water (q=5)

Parent (i)	Product (j)	DCF(j,5)*	ETF(j,5,5,t) * SF(j,t) At Time in Years (g/yr)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	3.400E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\* - The dose conversion factor units are mrem/pCi.

Dose Conversion and Environmental Transport Factors for the Fish Pathway (p=6)

Parent (i)	Product (j)	DCF(j,6)*	ETF(j,6,t) * SF(j,t) At Time in Years (g/yr)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	3.400E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\* - The dose conversion factor units are mrem/pCi.

Dose Conversion and Environmental Transport Factors for the Drinking Water Pathway (p=7)

Parent (i)	Product (j)	DCF(j,7)*	ETF(j,7,t) * SF(j,t) At Time in Years (g/yr)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	3.400E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\* - The dose conversion factor units are mrem/pCi.

Dose/Source Ratios for Internal Radiation from Ingestion of Plant Foods (p=3)

Subpathway: Root Uptake from Contaminated Soil (q=1)

Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,3,1t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	1.000E+00	2.332E-04	2.078E-04	1.649E-04	7.332E-05	7.130E-06	1.456E-09	0.000E+00	0.000E+00

The DSR includes contributions from associated (half-life ≤ 180 days) daughters.

Dose/Source Ratios for Internal Radiation from Ingestion of Plant Foods (p=3)

Subpathway: Foliar Uptake from Contaminated Dust (q=2)

Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,3,2t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	1.000E+00	1.537E-07	1.369E-07	1.087E-07	4.832E-08	4.698E-09	9.593E-13	0.000E+00	0.000E+00

The DSR includes contributions from associated (half-life ≤ 180 days) daughters.

Dose/Source Ratios for Internal Radiation from Ingestion of Plant Foods (p=3)

Subpathway: Ditch Irrigation (q=3)

Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,3,3t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

The DSR includes contributions from associated (half-life ≤ 180 days) daughters.

Dose/Source Ratios for Internal Radiation from Ingestion of Plant Foods (p=3)

Subpathway: Overhead Irrigation (q=4)

Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,3,4t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

The DSR includes contributions from associated (half-life ≤ 180 days) daughters.

Dose/Source Ratios for Internal Radiation from Ingestion of Plant Foods (p=3)

Total for All Subpathways

Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,3,t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	1.000E+00	2.333E-04	2.079E-04	1.650E-04	7.337E-05	7.134E-06	1.457E-09	0.000E+00	0.000E+00

The DSR includes contributions from associated (half-life ≤ 180 days) daughters.

Dose/Source Ratios for Internal Radiation from Ingestion of Meat (p=4)

Subpathway: Fodder Root Uptake from Contaminated Soil (q=1)

Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,4,1t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	1.000E+00	2.312E-06	2.061E-06	1.636E-06	7.274E-07	7.074E-08	1.447E-11	0.000E+00	0.000E+00

The DSR includes contributions from associated (half-life ≤ 180 days) daughters.

Dose/Source Ratios for Internal Radiation from Ingestion of Meat (p=4)

Subpathway: Fodder Foliar Uptake from Contaminated Dust (q=2)

Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,4,2t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	1.000E+00	6.134E-09	5.469E-09	4.341E-09	1.930E-09	1.877E-10	3.840E-14	0.000E+00	0.000E+00

The DSR includes contributions from associated (half-life ≤ 180 days) daughters.

Dose/Source Ratios for Internal Radiation from Ingestion of Meat (p=4)

Subpathway: Ditch Irrigation (q=3)

Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,4,3t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

The DSR includes contributions from associated (half-life ≤ 180 days) daughters.

Dose/Source Ratios for Internal Radiation from Ingestion of Meat (p=4)

Subpathway: Overhead Irrigation (q=4)

Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,4,4t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

The DSR includes contributions from associated (half-life ≤ 180 days) daughters.

Dose/Source Ratios for Internal Radiation from Ingestion of Meat (p=4)

Subpathway: Livestock Water (q=5)

Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,4,5t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

The DSR includes contributions from associated (half-life ≤ 180 days) daughters.

Dose/Source Ratios for Internal Radiation from Ingestion of Meat (p=4)

Total for All Subpathways

Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,4,t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	1.000E+00	2.260E-05	2.014E-05	1.598E-05	7.107E-06	6.911E-07	1.412E-10	0.000E+00	0.000E+00

The DSR includes contributions from associated (half-life ≤ 180 days) daughters.

Dose/Source Ratios for Internal Radiation from Ingestion of Milk (p=5)

Subpathway: Fodder Root Uptake from Contaminated Soil (q=1)

Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,5,1t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	1.000E+00	6.810E-06	6.070E-06	4.818E-06	2.142E-06	2.083E-07	4.259E-11	0.000E+00	0.000E+00

The DSR includes contributions from associated (half-life ≤ 180 days) daughters.

Dose/Source Ratios for Internal Radiation from Ingestion of Milk (p=5)

Subpathway: Fodder Foliar Uptake from Contaminated Dust (q=2)

Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,5,2t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	1.000E+00	1.807E-08	1.611E-08	1.278E-08	5.684E-09	5.528E-10	1.130E-13	0.000E+00	0.000E+00

The DSR includes contributions from associated (half-life ≤ 180 days) daughters.

Dose/Source Ratios for Internal Radiation from Ingestion of Milk (p=5)

Subpathway: Ditch Irrigation (q=3)

Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,5,3t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

The DSR includes contributions from associated (half-life ≤ 180 days) daughters.

Dose/Source Ratios for Internal Radiation from Ingestion of Milk (p=5)

Subpathway: Overhead Irrigation (q=4)

Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,5,4t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

The DSR includes contributions from associated (half-life ≤ 180 days) daughters.

Dose/Source Ratios for Internal Radiation from Ingestion of Milk (p=5)

Subpathway: Livestock Water (q=5)

Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,5,t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

The DSR includes contributions from associated (half-life ≤ 180 days) daughters.

Dose/Source Ratios for Internal Radiation from Ingestion of Milk (p=5)

Total for All Subpathways

Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,5,t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	1.000E+00	8.069E-05	7.189E-05	5.706E-05	2.537E-05	2.467E-06	5.036E-10	0.000E+00	0.000E+00

The DSR includes contributions from associated (half-life ≤ 180 days) daughters.



Dose/Source Ratios for Internal Radiation from the Ingestion of Fish (p=6)

Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,6,t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

The DSR includes contributions from associated (half-life ≤ 180 days) daughters.

Dose/Source Ratios for Internal Radiation from the Ingestion of Drinking Water (p=7)  
 Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,7,t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

The DSR includes contributions from associated (half-life ≤ 180 days) daughters.





Meat/Fodder, Milk/Fodder, Fodder/Air and Fodder/Water Concentration Ratios

FI(4,q): 68.0 kg/day      FI(5,q): 55.0 kg/day      q=1,2,3,4  
 FI(4,q): 50.0 L/day      FI(5,q): 160.0 L/day      q=5  
 FI(4,q): 0.5 kg/day      FI(5,q):

Nuclide (i)	FQR(i,4) d/kg	FQR(i,5) d/kg	FAR(i,3,2,3) m**3/g	FWR(i,3,3,3) L/g	FWR(i,3,4,3) L/g
Ba-133	2.0000E-04	5.0000E-04	2.8659E-01	2.6619E-07	1.8139E-03

FI(p,q) are the fodder (q=1,2,3,4), livestock water (q=5) and soil (q=6) intake rates;

FQR(i,p) are the transfer coefficients from contaminated fodder of livestock

water to meat (p=4) or milk (p=5). FAR(i,3,2,3) are the fodder/air

concentration ratios, and FWR(i,3,3,3) and FWR(i,3,4,3) are the fodder/

water concentration ratios for ditch and overhead irrigation, respectively.









Dose/Source Ratios for Soil Ingestion Pathway (p=8)  
 Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,8,t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	1.000E+00	5.274E-07	4.699E-07	3.729E-07	1.658E-07	1.612E-08	3.291E-12	0.000E+00	0.000E+00

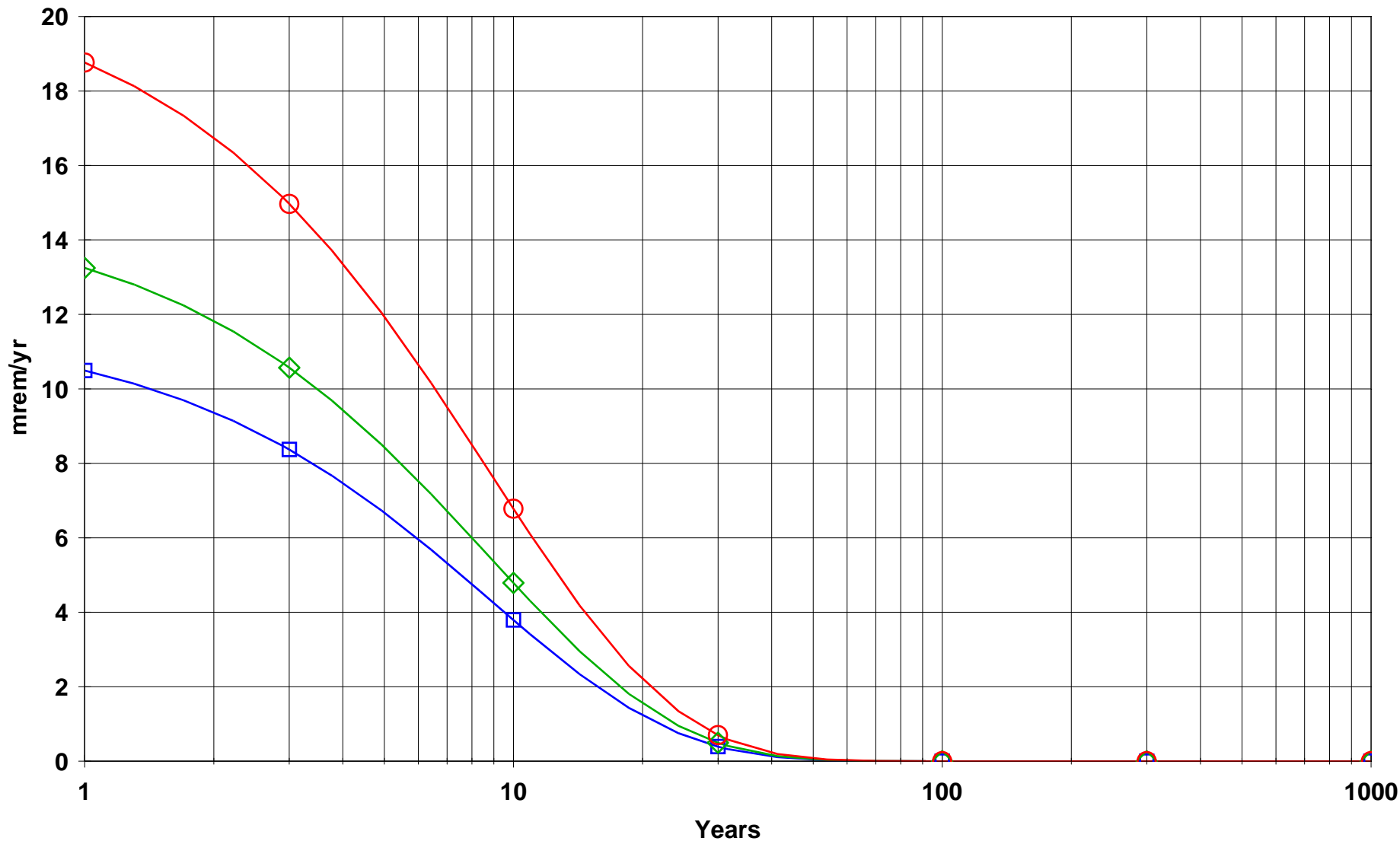
The DSR includes contributions from associated (half-life ≤ 180 days) daughters.

Dose Conversion and Environmental Transport Factors for the Soil Ingestion Pathway (p=8)

Parent (i)	Product (j)	DCF(j,8)*	ETF(j,8,t) At Time in Years (g/yr)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ba-133	Ba-133	3.400E-06	1.643E-01	1.632E-01	1.610E-01	1.533E-01	1.314E-01	5.475E-02	0.000E+00	0.000E+00

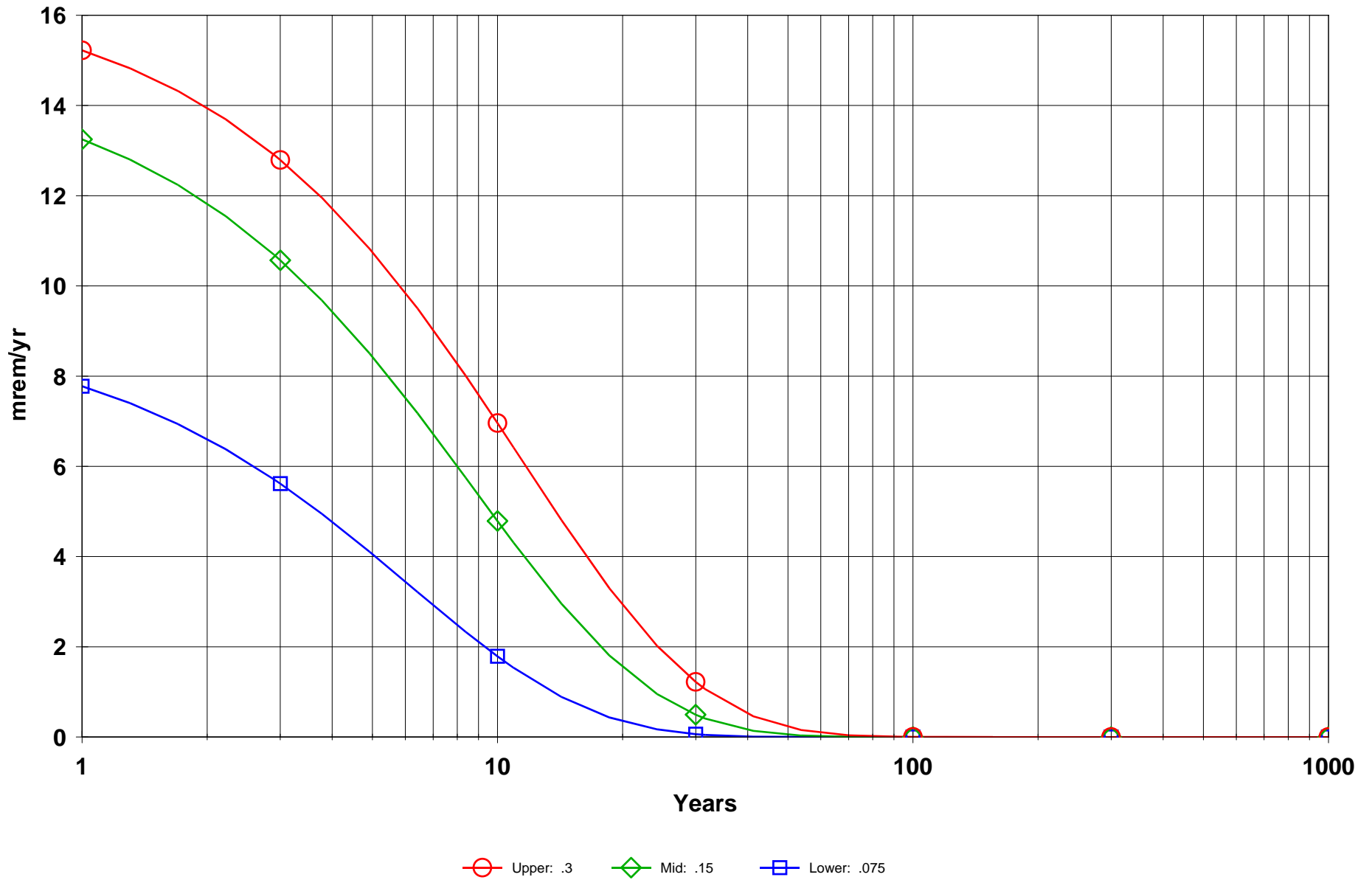
\* - The dose conversion factor units are mrem/pCi.

### DOSE: Ba-133, All Pathways Summed With SA on Outdoor Time fraction

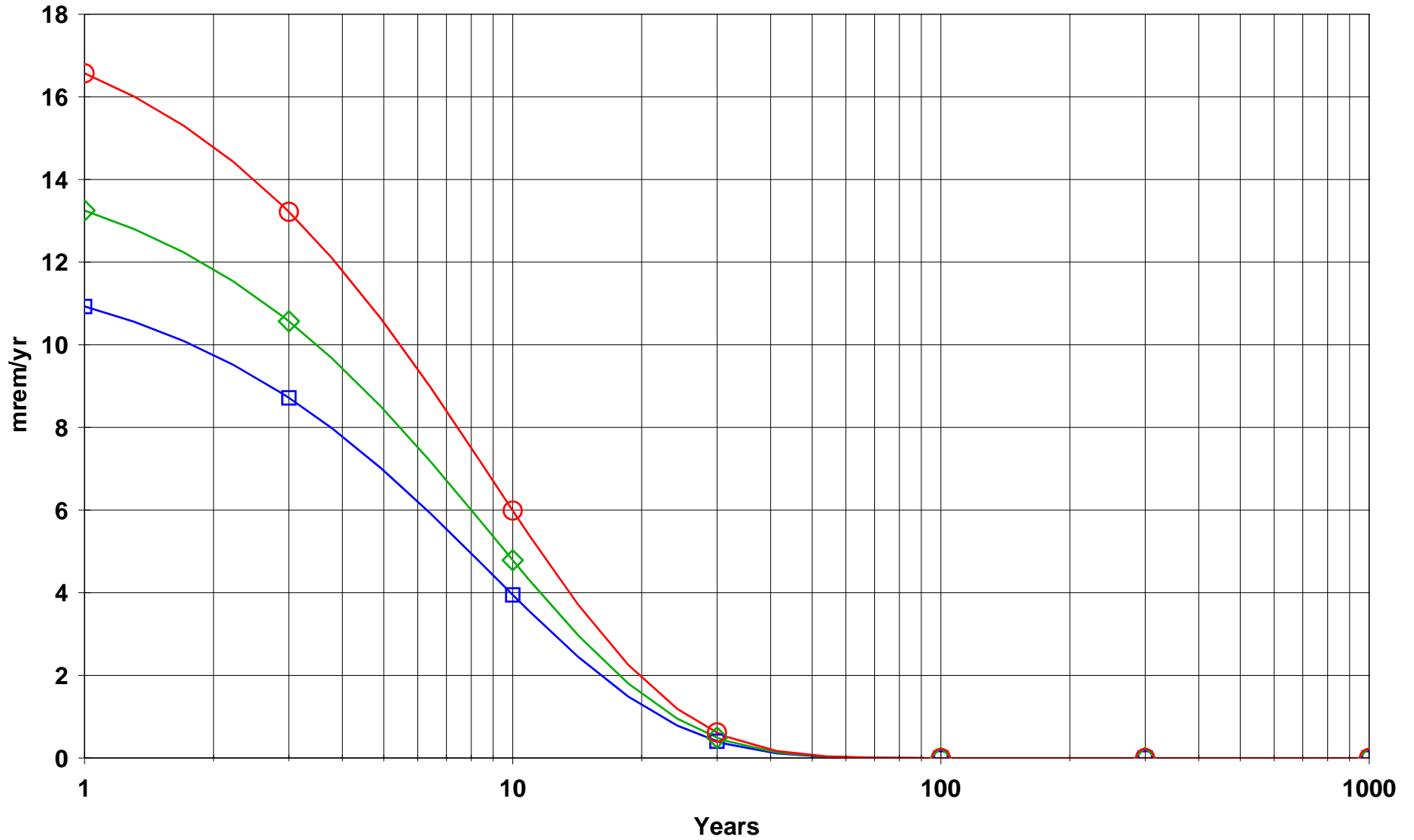


Upper: .5    Mid: .25    Lower: .125

# DOSE: Ba-133, All Pathways Summed With SA on Thickness of contaminated zone

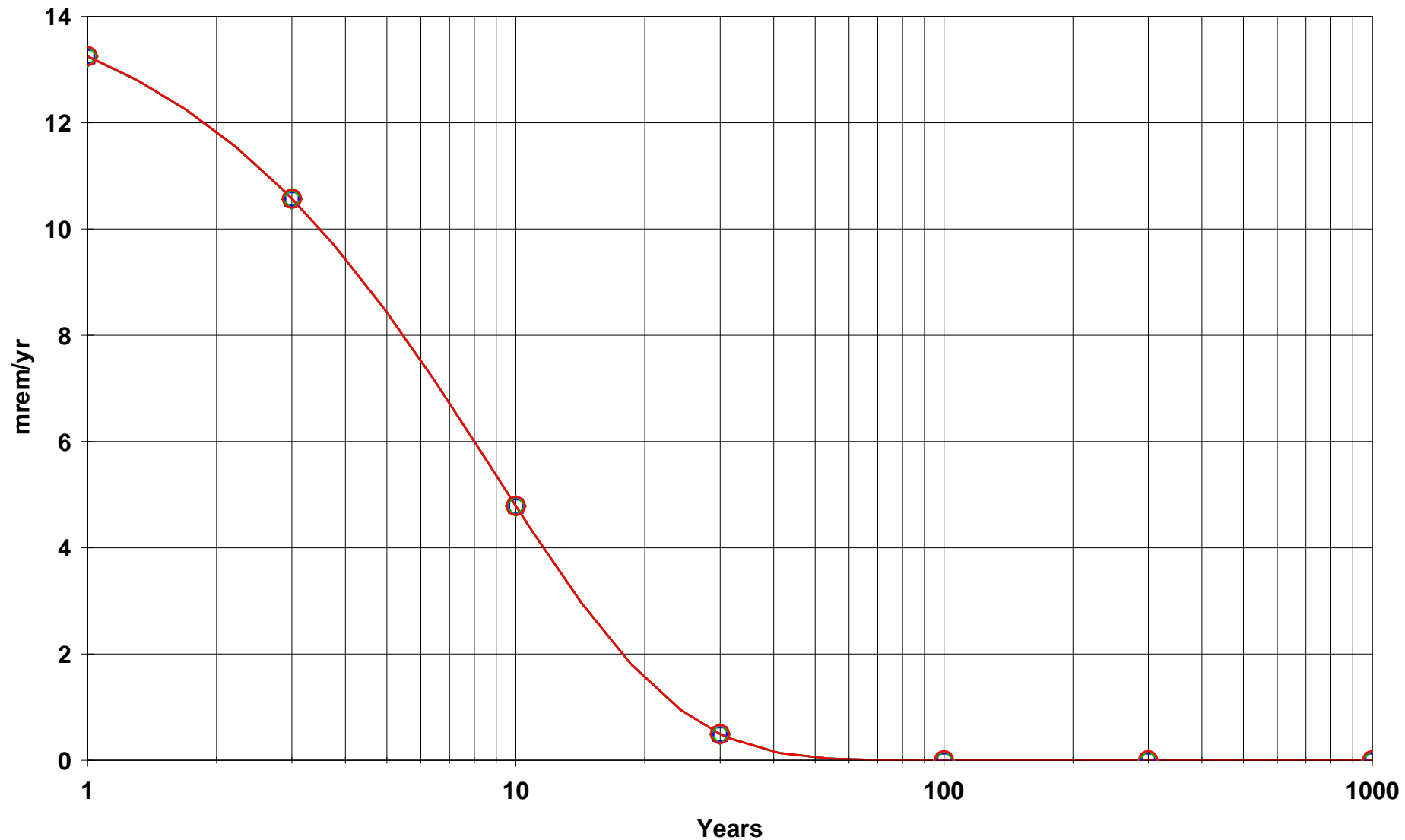


### DOSE: Ba-133, All Pathways Summed With SA on External Gamma Shielding factor



Upper: 1.001    Mid: .7    Lower: .4895105

### DOSE: Ba-133, All Pathways Summed With SA on Livestock intake of soil



Upper: 1    Mid: .5    Lower: .25

### DOSE: Ba-133, All Pathways Summed With SA on Area of contaminated zone

