

Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

Table of Contents

---

---

**Part II: Source Terms, Factors, and Parameters for Individual Pathways**

---

---

## Iteration Logs

Maximum Ra-226 Dose/Source Ratio .....	3
Maximum Th-230 Dose/Source Ratio .....	5
Maximum Total Dose .....	7

## Source Factors for Ingrowth and Decay

Radioactivity Only .....	9
Combined Radioactivity and Leaching .....	9

## Ground Pathway

Source Term Parameters .....	10
Time Dependence of Source Geometry .....	10
Occupancy, Cover/Depth, and Area Factors .....	11
Dose Conversion and Environmental Transport Factors .	11
Dose/Source Ratios .....	12

## Inhalation Pathway (radon excluded)

Dose/Source Ratios .....	13
Pathway Factors .....	13
Dose Conversion and Environmental Transport Factors .	13

## Radon Pathway

Flux and Parameters .....	14
Concentration and Parameters .....	15
Working Levels .....	16
Dose/Source Ratios .....	17

## Groundwater and Surface Water Pathway Segments

Transport Time Parameters for Unsaturated Zone Strata	18
Dilution Factor and Rise Time Parameters for Nondispersion (ND) Model .....	20
Primary Parameters Used to Calculate Ratios .....	20
Water/Soil Concentration Ratios .....	21

Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

Table of Contents (cont.)

Part II: Source Terms, Factors, and Parameters for Individual Pathways

---

## Food Pathways

Storage Times for Contaminated Foodstuffs .....	22
Storage Time Ingrowth and Decay Factors .....	22
Storage Correction Factors	
Drinking Water .....	23
Irrigation Water .....	23
Livestock Water .....	25
Plants .....	26
Livestock Fodder .....	27
Meat and Milk .....	28
Fish and Crustacea .....	28
Area and Depth Factors .....	29
Dose Conversion and Environmental Transport Factors	
Plant .....	31
Meat .....	33
Milk .....	35
Fish .....	37
Drinking Water .....	37
Dose/Source Ratios	
Plant .....	38
Plant Total .....	40
Meat .....	41
Meat Total .....	43
Milk .....	44
Milk Total .....	46
Fish .....	47
Drinking Water .....	48
Concentration Ratios	
Plant/Air and Plant/Water .....	49
Plant/Soil .....	49
Meat/Fodder, Fodder/Air, Fodder/Water .....	51
Fodder/Soil .....	52
Meat/Soil .....	54
Milk/Soil .....	56

## Soil Ingestion Pathway

Dose/Source Ratios.....	58
Dose Conversion and Environmental Transport Factors .	58

Iteration Log for Computation of the Time of Maximum Ra-226 Dose/Source Ratio  
Pathway: Radon (water independent)

Tolerance for tmax = 1.0E-03 (fractional accuracy)

Iteration Number	t (years)	DSR(t) (mrem/yr)/(pCi/g)	Step Size (years)	Step Type
0	3.36808E+03	1.21581E-04		
1	3.28035E+03	1.26310E-04	-8.77264E+01	parabolic
2	3.21095E+03	1.30181E-04	-6.94076E+01	parabolic
3	3.12445E+03	1.25168E-04	-8.65001E+01	golden section
4	3.20742E+03	1.30380E-04	-3.52600E+00	parabolic
5	3.17573E+03	1.29009E-04	-3.16932E+01	golden section
6	3.19920E+03	1.30805E-04	-8.22053E+00	parabolic
7	3.19023E+03	1.30118E-04	-8.96576E+00	golden section
8	3.19577E+03	1.30543E-04	-3.42464E+00	golden section
9	3.20240E+03	1.30666E-04	3.19920E+00	parabolic
10	3.19920E+03	1.30805E-04	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 Ra-226 Dose/Source Ratio  
 All Pathways Summed

Tolerance for tmax = 1.0E-03 (fractional accuracy)

Iteration Number	t (years)	DSR(t) (mrem/yr)/(pCi/g)	Step Size (years)	Step Type
0	3.36808E+03	1.21581E-04		
1	3.28035E+03	1.26310E-04	-8.77264E+01	parabolic
2	3.21095E+03	1.30181E-04	-6.94076E+01	parabolic
3	3.12445E+03	1.25168E-04	-8.65001E+01	golden section
4	3.20742E+03	1.30380E-04	-3.52600E+00	parabolic
5	3.17573E+03	1.29009E-04	-3.16932E+01	golden section
6	3.19920E+03	1.30805E-04	-8.22053E+00	parabolic
7	3.19023E+03	1.30118E-04	-8.96576E+00	golden section
8	3.19577E+03	1.30543E-04	-3.42464E+00	golden section
9	3.20240E+03	1.30666E-04	3.19920E+00	parabolic
10	3.19920E+03	1.30805E-04	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-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.

Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

Iteration Log for Computation of the Time of Maximum Th-230 Dose/Source Ratio  
Pathway: Radon (water independent)

Tolerance for tmax = 1.0E-03 (fractional accuracy)

Iteration Number	t (years)	DSR(t) (mrem/yr)/(pCi/g)	Step Size (years)	Step Type
0	8.99700E+03	4.82665E-04		
1	9.12882E+03	4.82683E-04	1.31815E+02	parabolic
2	9.13794E+03	4.82683E-04	4.99831E+00	parabolic
3	9.11969E+03	4.82683E-04	-9.12882E+00	parabolic
4	9.12882E+03	4.82683E-04	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 Th-230 Dose/Source Ratio  
All Pathways Summed

Tolerance for tmax = 1.0E-03 (fractional accuracy)

Iteration Number	t (years)	DSR(t) (mrem/yr)/(pCi/g)	Step Size (years)	Step Type
0	8.99700E+03	4.82665E-04		
1	9.12882E+03	4.82683E-04	1.31815E+02	parabolic
2	9.13794E+03	4.82683E-04	4.99831E+00	parabolic
3	9.11969E+03	4.82683E-04	-9.12882E+00	parabolic
4	9.12882E+03	4.82683E-04	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.

Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

Iteration Log for Computation of the Time of Maximum Total Dose  
Pathway: Radon (water independent)

Tolerance for tmax = 1.0E-03 (fractional accuracy)

Iteration Number	t (years)	TDOSE(t) (mrem/yr)	Step Size (years)	Step Type
0	8.99700E+03	2.47436E+01		
1	8.98800E+03	2.47436E+01	-7.81159E-01	parabolic
2	8.97901E+03	2.47436E+01	-8.98800E+00	parabolic
3	8.98800E+03	2.47436E+01	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.

Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

Iteration Log for Computation of the Time of Maximum Total Dose  
All Pathways Summed

Tolerance for tmax = 1.0E-03 (fractional accuracy)

Iteration Number	t (years)	TDOSE(t) (mrem/yr)	Step Size (years)	Step Type
0	8.99700E+03	2.47436E+01		
1	8.98800E+03	2.47436E+01	-7.81159E-01	parabolic
2	8.97901E+03	2.47436E+01	-8.98800E+00	parabolic
3	8.98800E+03	2.47436E+01	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.



Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

## Source Factors for Ingrowth and Decay

## Radioactivity Factors Only

## Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Branch Fraction*	ID(j,t) = CUMBRF(j)*S1(j,t)/S1(i,0)				
			t=	0.000E+00	3.000E+02	1.000E+03	8.997E+03
Pb-210	Pb-210	1.000E+00	1.000E+00	8.918E-05	3.169E-14	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	1.000E+00	8.781E-01	6.484E-01	2.029E-02	1.314E-02
Ra-226	Pb-210	1.000E+00	0.000E+00	8.904E-01	6.576E-01	2.058E-02	1.332E-02
Th-230	Th-230	1.000E+00	1.000E+00	9.973E-01	9.910E-01	9.222E-01	9.139E-01
Th-230	Ra-226	1.000E+00	0.000E+00	1.217E-01	3.499E-01	9.211E-01	9.199E-01
Th-230	Pb-210	1.000E+00	0.000E+00	1.093E-01	3.408E-01	9.210E-01	9.200E-01

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR

## Source Factors for Ingrowth and Decay

## Combined Radioactivity and Leaching Factors

## Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Branch Fraction*	SF(j,t) = CUMBRF(j)*S1(j,t)/S1(i,0)				
			t=	0.000E+00	3.000E+02	1.000E+03	8.997E+03
Pb-210	Pb-210	1.000E+00	1.000E+00	8.915E-05	3.165E-14	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	1.000E+00	8.777E-01	6.473E-01	1.998E-02	1.292E-02
Ra-226	Pb-210	1.000E+00	0.000E+00	8.900E-01	6.565E-01	2.026E-02	1.310E-02
Th-230	Th-230	1.000E+00	1.000E+00	9.973E-01	9.910E-01	9.222E-01	9.139E-01
Th-230	Ra-226	1.000E+00	0.000E+00	1.217E-01	3.496E-01	9.176E-01	9.164E-01
Th-230	Pb-210	1.000E+00	0.000E+00	1.093E-01	3.405E-01	9.176E-01	9.164E-01

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR

The effect of volatilization was also considered when computing the source factors for H-3 and C-14.

Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

## 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): 0.200000 m/yr  
 Cover Removal Time (Tc): 3.200E+03 yr  
 Overhead irrigation rate (Irr): 0.000 m/yr  
 Evapotranspiration coeff. (Ce): 0.500  
 Bulk soil density (rhob): 1.800 g/cm\*\*3  
 Runoff coefficient (Cr): 0.974  
 Infiltration rate (In): 0.003 m/yr  
 Effective porosity (pe): 0.000

Radio-nuclide (i)	Distribution Coefficient Kd(i), cm**3/g	Leaching Ratio q(i)
Pb-210	1.000000E+02	1.210E-03
Ra-226	7.000000E+01	1.727E-03
Th-230	6.000000E+04	2.019E-06

## Time Dependence of Source Geometry

## Time Dependence of Cover Depth [Cd(i,t)]

Nuclide (i)	Cd(i,t) (meters)				
	t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	3.2000E+00	2.9000E+00	2.2000E+00	0.0000E+00	0.0000E+00
Ra-226	3.2000E+00	2.9000E+00	2.2000E+00	0.0000E+00	0.0000E+00
Th-230	3.2000E+00	2.9000E+00	2.2000E+00	0.0000E+00	0.0000E+00

## Time Dependence of Contaminated Zone Thicknesses [T(i,t)]

Nuclide (i)	T(i,t) (meters)				
	t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	1.2000E+01	1.2000E+01	1.2000E+01	6.2030E+00	5.2000E+00
Ra-226	1.2000E+01	1.2000E+01	1.2000E+01	6.2030E+00	5.2000E+00
Th-230	1.2000E+01	1.2000E+01	1.2000E+01	6.2030E+00	5.2000E+00

Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

## Occupancy, Cover/Depth, and Area Factors for Ground Pathway

Occupancy Factor (FO1): 0.000  
 Area (A): 324. sq. meters

Initial cover depth (Cd): 3.200 meters

Initial contaminated zone thickness (T): 12.000 meters

## Time Dependence of Cover/Depth Factor [FCTR\_COV\_DEPTH(i,t)]

Nuclide (i)	FCTR_COV_DEPTH(i,t) (dimensionless)				
	t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	0.000E+00	0.000E+00	0.000E+00	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	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## Dose Conversion and Environmental Transport Factors for the Ground Pathway (p=1)

Parent (i)	Product (j)	DCF(j,1)*	ETF(j,1,t) (dimensionless)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	6.120E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.120E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	6.120E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	1.210E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.120E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	6.120E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\* - The dose conversion factor units are (mrem/yr)/(pCi/g) at infinite depth and area.

Dose/Source Ratios for External Radiation from the Ground (p=1)  
 Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Branch Fraction*	t=	DSR(j,1,t) (mrem/yr)/(pCi/g)				
				0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR  
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

Dose/Source Ratios for Inhalation Pathway, Excluding Radon (p=2)  
 Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Branch Fraction*	DSR(j,2,t) (mrem/yr)/(pCi/g)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR  
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Pathway Factors for the Inhalation Pathway (radon excluded)

Area (A):	3.2400E+02 m**2	Occupancy Factor (FO2):	1.0000E+00
Area Factor (FA2):	1.1841E-01	Annual Air Intake (F12):	8.4000E+03 m**3/yr
Cover Depth [Cd(0)]:	3.2000E+00 m	Mass Loading (ASR2):	1.0000E-04 g/m**3
Contaminated Zone Thickness [T(0)]:	1.2000E+01 m	FA2 * FO2 * F12 * ASR2:	9.9462E-02 g/yr

Nuclide (i)	Depth Factor [FD(i,2,t)] (dimensionless)	t=				
		0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210+D		0.0000E+00	0.0000E+00	0.0000E+00	1.0000E+00	1.0000E+00
Ra-226+D		0.0000E+00	0.0000E+00	0.0000E+00	1.0000E+00	1.0000E+00
Th-230		0.0000E+00	0.0000E+00	0.0000E+00	1.0000E+00	1.0000E+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) (g/yr)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	2.320E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	8.600E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	2.320E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	3.260E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	8.600E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	2.320E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\* - The dose conversion factor units are mrem/pCi.

Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

## Parameters Used for Calculating Indoor and Outdoor Radon Flux

	*Floor Material	Cover Material	Contaminated Zone
Radon Diffusion Coefficient (m**2/s)	3.000E-07	2.000E-06	2.000E-06
Total Porosity	1.000E-01	4.000E-01	4.000E-01
Volumetric Water Content	3.000E-02	5.000E-02	2.180E-01
Bulk Density (g/cm**3)	2.400E+00	1.500E+00	1.800E+00
Rn-222 Emanation Coefficient	2.500E-01	2.500E-01	2.500E-01
Initial Thickness (m)	1.500E-01	3.200E+00	1.200E+01

Building Depth Below Ground Surface \*(DMFL): -1.000E+00 (m)

Negative DMFL shows building depth adjusted (if necessary) for no penetration of contaminated zone. Actual values used \*(DMFLACT), m:

t= 0.0000E+00 3.0000E+02 1.0000E+03 8.9970E+03 1.0000E+04

DMFLACT= 1.0000E+00 1.0000E+00 1.0000E+00 0.0000E+00 0.0000E+00

Building indoor area factor \*(FAI): 0.000E+00

FAI &lt;= 0.0 shows calculated time-dependent value based on amount of wall area extending into the contaminated zone. Actual values used \*(FAIACT):

t= 0.0000E+00 3.0000E+02 1.0000E+03 8.9970E+03 1.0000E+04

FAIACT = 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00

\* - Parameters are used only for indoor radon flux

## Time Dependence of Outdoor Radon Flux [FLUXO(i,t)]

Nuclide (i)	t=	FLUXO(i,t) (pCi/m**2/s)				
		0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Ra-226		1.0328E+02	1.2332E+02	1.8614E+02	5.4683E+01	3.5344E+01
Th-230		0.0000E+00	2.9473E+02	1.7331E+03	4.3299E+04	4.3232E+04

## Time Dependence of Indoor Radon Flux [FLUXI(i,t)]

Nuclide (i)	t=	FLUXI(i,t) (pCi/m**2/s)				
		0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Ra-226		5.4446E+01	6.5161E+01	9.8158E+01	1.0348E+01	6.6891E+00
Th-230		0.0000E+00	1.5573E+02	9.1393E+02	8.1934E+03	8.1819E+03

Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

## Parameters Used for Calculating Indoor and Outdoor Radon Concentration

Radon Vertical Dimension of Mixing (HMIX): 2.000E+00 (m)  
 Average Annual Wind Speed (WIND): 2.000E+00 (m/sec)  
 Building Room Height (HRM): 2.500E+00 (m)  
 Building Air Exchange Rate (REXG): 5.000E-01 (1/hr)

## Time Dependence of Outdoor Radon Concentration [CRNO(i,t)]

Nuclide (i)	t=	CRNO(i,t) (pCi/m**3)				
		0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Ra-226	2.3237E+02	2.7747E+02	4.1880E+02	1.2304E+02	7.9524E+01	
Th-230	0.0000E+00	6.6314E+02	3.8994E+03	9.7421E+04	9.7271E+04	

## Time Dependence of Indoor Radon Concentration [HCONC(i,r)]

Nuclide (i)	t=	HCONC(i,t) (pCi/m**3)				
		0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Ra-226	1.5470E+05	1.8514E+05	2.7890E+05	2.9478E+04	1.9056E+04	
Th-230	0.0000E+00	4.4248E+05	2.5967E+06	2.3342E+07	2.3309E+07	

Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

## Outdoor Working Levels of Radon [WLOTD(i,t)]

Nuclide (i)	t=	WLOTD(i,t) (WL)				
		0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Ra-226	2.0347E-06	2.4296E-06	3.6672E-06	1.0773E-06	6.9633E-07	
Th-230	0.0000E+00	5.8066E-06	3.4144E-05	8.5305E-04	8.5174E-04	

## Indoor Working Levels of Radon [WLIND(i,t)]

Nuclide (i)	t=	WLIND(i,t) (WL)				
		0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Ra-226	1.0667E+00	1.2767E+00	1.9232E+00	2.0327E-01	1.3140E-01	
Th-230	0.0000E+00	3.0511E+00	1.7906E+01	1.6095E+02	1.6073E+02	

Fraction of Time Spent Outdoors (FOTD): 1.000E+00

Fraction of Time Spent Indoors (FIND): 0.000E+00



Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

## Dose/Source Ratios for Radon Pathway (p=9)

Subpathway: Outdoor and Indoor Radon Flux

## Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Branch Fraction*	DSR(j,9,t) - DSRRNW(j,t) (mrem/yr)/(pCi/g)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	1.985E-05	2.371E-05	3.578E-05	1.051E-05	6.791E-06
Ra-226	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	∑DSR(j)		1.985E-05	2.371E-05	3.578E-05	1.051E-05	6.791E-06
Th-230	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.000E+00	4.301E-09	3.292E-06	1.934E-05	4.827E-04	4.819E-04
Th-230	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	∑DSR(j)		4.301E-09	3.292E-06	1.934E-05	4.827E-04	4.819E-04

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR  
The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

## Dose/Source Ratios for Radon Pathway (p=9)

Subpathway: Indoor Radon from Water Usage

## Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Branch Fraction*	DSRRNW(j,t) (mrem/yr)/(pCi/g)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR  
The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

## Transport Time Parameters for Unsaturated Zone Stratum No. 1

Stratum thickness [h(1)]: 0.600000 m  
 Bulk soil material density [rhob(1)]: 1.800000 g/cm\*\*3  
 Effective porosity [peuz(1)]: 0.200000  
 Hydraulic conductivity [Khuz(1)]: 0.300000 m/yr  
 Total porosity [ptuz(1)]: 0.400000  
 Soil specific b parameter [buz(1)]: 5.300000  
 Saturation ratio [sruz(1)]: 0.705296

Radio-nuclide (i)	Distribution Coefficient Kduz(i,1), cm**3/g	Retardation Factor Rduz(i,1)	Transport Time Dtuz(i,1), yr
Pb-210	1.0000E+02	6.3903E+02	2.0802E+04
Ra-226	7.0000E+01	4.4762E+02	1.4571E+04
Th-230	6.0000E+04	3.8282E+05	1.2462E+07

## Transport Time Parameters for Unsaturated Zone Stratum No. 2

Stratum thickness [h(2)]: 4.430000 m  
 Bulk soil material density [rhob(2)]: 1.570000 g/cm\*\*3  
 Effective porosity [peuz(2)]: 0.200000  
 Hydraulic conductivity [Khuz(2)]: 189.000000 m/yr  
 Total porosity [ptuz(2)]: 0.400000  
 Soil specific b parameter [buz(2)]: 5.300000  
 Saturation ratio [sruz(2)]: 0.500000

Radio-nuclide (i)	Distribution Coefficient Kduz(i,2), cm**3/g	Retardation Factor Rduz(i,2)	Transport Time Dtuz(i,2), yr
Pb-210	1.0000E+02	7.8600E+02	1.3392E+05
Ra-226	7.0000E+01	5.5050E+02	9.3797E+04
Th-230	6.0000E+04	4.7100E+05	8.0251E+07

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]: 0.290000  
 Hydraulic conductivity [Khaq]: 239.000000 m/yr  
 Total porosity [ptaq]: 0.400000  
 Soil specific b parameter [baq]: 5.300000  
 Saturation ratio [sruaq]: 0.500000

Radio-nuclide	Distribution Coefficient	Retardation Factor	Minimum Transport Time
(i)	Kdaq(i), cm**3/g	Rduaq(i)	Dtuaq(i), yr
Pb-210	1.0000E+02	7.5100E+02	Infinite
Ra-226	7.0000E+01	5.2600E+02	Infinite
Th-230	6.0000E+04	4.5000E+05	Infinite

Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

## Dilution Factor and Rise Time Parameters for Nondispersion (ND) Model

Aquifer contamination depth at well (z): 1.95816E-01 m  
 Depth of water intake below water table (dw): 1.00000E+01 m  
 Infiltration rate (In): 2.60000E-03 m/yr  
 Aquifer water flow rate (Vwfr): 2.39000E-01 m/yr  
 Hydraulic gradient (J): 1.00000E-03  
 Hydraulic conductivity of aquifer (Kszh): 2.39000E+02 m/yr  
 Contaminated zone extent parallel to gradient (l): 1.80000E+01 m  
 Distance below contaminated zone to water table (h): 0.50300E+01 m  
 Initial thickness of uncontaminated cover (Cd): 0.32000E+01 m  
 Initial thickness of contaminated zone (T): 0.12000E+02 m  
 Effective porosity of saturated zone (pesz): 0.29000E+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
Pb-210	3.370E-03	3.760E+02	8.212E+03	8.212E+03	3.217E+01
Ra-226	3.370E-03	2.635E+02	5.755E+03	5.755E+03	2.308E+03
Th-230	3.370E-03	2.250E+05	4.914E+06	4.914E+06	1.111E+05

Primary Parameters Used for Calculating Water/Soil Concentration Ratios for Groundwater Pathway Segment

Model used: Nondispersion (ND)

Bulk soil density in contaminated zone (rhob): 1.800 g/cm<sup>3</sup>

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
Pb-210	3.370E-03	8.267E+02	Infinite	Infinite	8.212E+03
Ra-226	3.370E-03	5.790E+02	Infinite	Infinite	5.755E+03
Th-230	3.370E-03	4.954E+05	Infinite	Infinite	4.914E+06

Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

## Water/Soil Concentration Ratios [WSR(j,1,t)] for Groundwater Pathway Segment

Parent (i)	Product (j)	Branch Fraction*	WSR(j,1,t) in (pCi/L)/(pCi/g)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## Water/Soil Concentration Ratios [WSR(j,2,t)] for Surface Water Pathway Segment

Watershed Area (Aw) = 1.0000E+06 m\*\*2  
 Contaminated Zone Area (A) = 3.2400E+02 m\*\*2  
 Dilution Factor (f') = 3.2400E-04  
 Soil Density (rhob) = 1.8000E+00 kg/m\*\*3

Parent (i)	Product (j)	Branch Fraction*	WSR(j,2,t) in (pCi/L)/(pCi/g)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

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)	Branch 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	1.000E+00
Pb-210	Pb-210	1.000E+00	9.988E-01	9.999E-01	9.999E-01	9.983E-01	9.994E-01	9.994E-01	9.999E-01	9.999E-01	9.999E-01	
Ra-226	Ra-226	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	
Ra-226	Pb-210	1.000E+00	1.191E-03	8.510E-05	8.510E-05	1.701E-03	5.955E-04	5.955E-04	8.510E-05	8.510E-05	8.510E-05	
Th-230	Th-230	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	
Th-230	Ra-226	1.000E+00	1.661E-05	1.186E-06	1.186E-06	2.372E-05	8.303E-06	8.303E-06	1.186E-06	1.186E-06	1.186E-06	
Th-230	Pb-210	1.000E+00	9.888E-09	5.047E-11	5.047E-11	2.018E-08	2.472E-09	2.472E-09	5.047E-11	5.047E-11	5.047E-11	

CONCE(i,j,t)/CONCE(i,i,0) is the concentration ratio of Product(j) at time t to Parent(i) at start of

Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

## 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)	Branch Fraction*	CFWW(j,t,1)#				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	1.000E+00	9.999E-01	9.999E-01	9.999E-01	9.999E-01
Ra-226	Ra-226	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Ra-226	Pb-210	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Th-230	Th-230	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Th-230	Ra-226	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Th-230	Pb-210	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR

#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)	Branch Fraction*	CFWW(j,t,2)#				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	1.000E+00	9.999E-01	9.999E-01	9.999E-01	9.999E-01
Ra-226	Ra-226	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Ra-226	Pb-210	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Th-230	Th-230	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Th-230	Ra-226	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Th-230	Pb-210	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR

#Correction factor = (concentration in media at consumption time)/(concentration at harvest time).

Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

## 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)	Branch Fraction*	CFWW(j,t,3)#				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	1.000E+00	9.999E-01	9.999E-01	9.999E-01	9.999E-01
Ra-226	Ra-226	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Ra-226	Pb-210	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Th-230	Th-230	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Th-230	Ra-226	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Th-230	Pb-210	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR

#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)	Branch Fraction*	CFWW(j,t,5)#				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	1.000E+00	9.999E-01	9.999E-01	9.999E-01	9.999E-01
Ra-226	Ra-226	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Ra-226	Pb-210	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Th-230	Th-230	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Th-230	Ra-226	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Th-230	Pb-210	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR

#Correction factor = (concentration in media at consumption time)/(concentration at harvest time).



Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

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)	Branch Fraction*	CFWW(j,t,7)#				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	1.000E+00	9.999E-01	9.999E-01	9.999E-01	9.999E-01
Ra-226	Ra-226	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Ra-226	Pb-210	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Th-230	Th-230	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Th-230	Ra-226	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Th-230	Pb-210	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR  
 #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)	Branch Fraction*	CFWW(j,t,4)#				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	1.000E+00	9.999E-01	9.999E-01	9.999E-01	9.999E-01
Ra-226	Ra-226	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Ra-226	Pb-210	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Th-230	Th-230	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Th-230	Ra-226	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Th-230	Pb-210	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR  
 #Correction factor = (concentration in media at consumption time)/(concentration at harvest time).



Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

## Storage Time Correction Factors for Leafy Plants

Harvest Time = t - 2.74E-03 yr; Consumption Time = t yr

Parent (i)	Product (j)	Branch Fraction*	CF3(j,2,t)#				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Th-230	Th-230	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Th-230	Ra-226	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Th-230	Pb-210	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR

#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)	Branch Fraction*	CFLF(j,1,t)#				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	1.000E+00	9.962E-01	9.962E-01	9.962E-01	9.962E-01
Ra-226	Ra-226	1.000E+00	1.000E+00	9.999E-01	9.999E-01	9.999E-01	9.999E-01
Ra-226	Pb-210	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.011E+00	1.011E+00
Th-230	Th-230	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Th-230	Ra-226	1.000E+00	1.000E+00	1.000E+00	1.000E+00	9.999E-01	9.999E-01
Th-230	Pb-210	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.011E+00	1.011E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR

#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)	Branch Fraction*	CFLF(j,2,t)#				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	1.000E+00	9.962E-01	9.962E-01	9.962E-01	9.962E-01
Ra-226	Ra-226	1.000E+00	1.000E+00	9.999E-01	9.999E-01	9.999E-01	9.999E-01
Ra-226	Pb-210	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.011E+00	1.011E+00
Th-230	Th-230	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Th-230	Ra-226	1.000E+00	1.000E+00	1.000E+00	1.000E+00	9.999E-01	9.999E-01
Th-230	Pb-210	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.011E+00	1.011E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR

#Correction factor = (concentration in media at consumption time)/(concentration at harvest time).

Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

## Storage Time Correction Factors for Meat

Harvest Time = t - 5.48E-02 yr; Consumption Time = t yr

Parent (i)	Product (j)	Branch Fraction*	CF45(j,1,t)#				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	1.000E+00	9.983E-01	9.983E-01	9.983E-01	9.983E-01
Ra-226	Ra-226	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Ra-226	Pb-210	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.004E+00	1.004E+00
Th-230	Th-230	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Th-230	Ra-226	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Th-230	Pb-210	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.004E+00	1.004E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR

#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)	Branch Fraction*	CF45(j,2,t)#				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	1.000E+00	9.999E-01	9.999E-01	9.999E-01	9.999E-01
Ra-226	Ra-226	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Ra-226	Pb-210	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.001E+00	1.001E+00
Th-230	Th-230	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Th-230	Ra-226	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Th-230	Pb-210	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.001E+00	1.001E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR

#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)	Branch Fraction*	CFF(j,1,t)#				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	1.000E+00	9.994E-01	9.994E-01	9.994E-01	9.994E-01
Ra-226	Ra-226	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Ra-226	Pb-210	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Th-230	Th-230	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Th-230	Ra-226	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Th-230	Pb-210	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR

#Correction factor = (concentration in media at consumption time)/(concentration at harvest time).

Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

Area and Depth Factors for Plant (p=3), Meat (p=4), and Milk (p=5) Pathways  
 Root Uptake from Contaminated Soil (q=1)

Area Factor for Plant Foods [FA(3)] = 0.16

Nuclide (i)	Depth Factor FD(i,1,t) (dimensionless)				
	t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	0.0000E+00	0.0000E+00	0.0000E+00	1.0000E+00	1.0000E+00
Ra-226	0.0000E+00	0.0000E+00	0.0000E+00	1.0000E+00	1.0000E+00
Th-230	0.0000E+00	0.0000E+00	0.0000E+00	1.0000E+00	1.0000E+00

Area and Depth Factors for Plant (p=3), Meat (p=4), and Milk (p=5) Pathways  
 Foliar Uptake from Contaminated Dust (q=2)

Area Factor for Plant Foods [FA(3)] = 0.16

Nuclide (i)	Depth Factor FD(i,2,t) (dimensionless)				
	t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	0.0000E+00	0.0000E+00	0.0000E+00	1.0000E+00	1.0000E+00
Ra-226	0.0000E+00	0.0000E+00	0.0000E+00	1.0000E+00	1.0000E+00
Th-230	0.0000E+00	0.0000E+00	0.0000E+00	1.0000E+00	1.0000E+00

Area and Depth Factors for Plant (p=3), Meat (p=4), and Milk (p=5) Pathways  
 Ditch Irrigation (q=3)

Area Factor for Plant Foods [FA(3)] = 0.16

Nuclide (i)	Depth Factor FD(i,3,t) (dimensionless)				
	t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00
Ra-226	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00
Th-230	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00

Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

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)] = 0.16

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] = 0.02

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.

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] = 0.02

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.

Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

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) (g/yr)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	7.270E-03	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: Foliar Uptake from Contaminated Dust (q=2)

Parent (i)	Product (j)	DCF(j,3)*	ETF(j,3,2,t) (g/yr)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	7.270E-03	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: Ditch Irrigation (q=3)

Parent (i)	Product (j)	DCF(j,3)*	ETF(j,3,3,t) * SF(j,t) (g/yr)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\* - The dose conversion factor units are mrem/pCi.

Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

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) (g/yr)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\* - The dose conversion factor units are mrem/pCi.



Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

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) (g/yr)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	7.270E-03	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 Foliar Uptake from Contaminated Dust (q=2)

Parent (i)	Product (j)	DCF(j,4)*	ETF(j,4,2,t) (g/yr)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	7.270E-03	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: Ditch Irrigation (q=3)

Parent (i)	Product (j)	DCF(j,4)*	ETF(j,4,3,t) * SF(j,t) (g/yr)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\* - The dose conversion factor units are mrem/pCi.

Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

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) (g/yr)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	7.270E-03	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) (g/yr)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\* - The dose conversion factor units are mrem/pCi.

Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

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) (g/yr)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	7.270E-03	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 Foliar Uptake from Contaminated Dust (q=2)

Parent (i)	Product (j)	DCF(j,5)*	ETF(j,5,2,t) (g/yr)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	7.270E-03	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: Ditch Irrigation (q=3)

Parent (i)	Product (j)	DCF(j,5)*	ETF(j,5,3,t) * SF(j,t) (g/yr)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\* - The dose conversion factor units are mrem/pCi.

Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

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) (g/yr)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	7.270E-03	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) (g/yr)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\* - The dose conversion factor units are mrem/pCi.

Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

## 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) (g/yr)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	7.270E-03	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) (g/yr)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	7.270E-03	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)	Branch Fraction*	DSR(j,3,1,t) (mrem/yr)/(pCi/g)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR  
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) 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)	Branch Fraction*	DSR(j,3,2,t) (mrem/yr)/(pCi/g)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR  
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

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)	Branch Fraction*	t=	DSR(j,3,3,t) (mrem/yr)/(pCi/g)				
				0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	∑DSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	∑DSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR

The DSR includes contributions from associated (half-life ≤ 0.5 yr) 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)	Branch Fraction*	t=	DSR(j,3,4,t) (mrem/yr)/(pCi/g)				
				0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	∑DSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	∑DSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR

The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

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)	Branch Fraction*	t=	DSR(j,3,t) (mrem/yr)/(pCi/g)				
				0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR  
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) 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)	Branch Fraction*	DSR(j,4,1,t) (mrem/yr)/(pCi/g)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR  
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) 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)	Branch Fraction*	DSR(j,4,2,t) (mrem/yr)/(pCi/g)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR  
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) 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)	Branch Fraction*	DSR(j,4,3,t) (mrem/yr)/(pCi/g)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR  
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) 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)	Branch Fraction*	DSR(j,4,4,t) (mrem/yr)/(pCi/g)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR  
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) 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)	Branch Fraction*	DSR(j,4,5,t) (mrem/yr)/(pCi/g)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR  
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) 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)	Branch Fraction*	DSR(j,4,t) (mrem/yr)/(pCi/g)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR  
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) 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)	Branch Fraction*	DSR(j,5,1,t) (mrem/yr)/(pCi/g)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR  
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) 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)	Branch Fraction*	DSR(j,5,2,t) (mrem/yr)/(pCi/g)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR  
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) 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)	Branch Fraction*	DSR(j,5,3,t) (mrem/yr)/(pCi/g)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR  
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) 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)	Branch Fraction*	DSR(j,5,4,t) (mrem/yr)/(pCi/g)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR  
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) 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)	Branch Fraction*	t=	DSR(j,5,5,t) (mrem/yr)/(pCi/g)				
				0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	∑DSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	∑DSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR  
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) 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)	Branch Fraction*	t=	DSR(j,5,t) (mrem/yr)/(pCi/g)				
				0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	∑DSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	∑DSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR  
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) 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)	Branch Fraction*	t=	DSR(j,6,t) (mrem/yr)/(pCi/g)				
				0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR  
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) 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)	Branch Fraction*	t=	DSR(j,7,t) (mrem/yr)/(pCi/g)				
				0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR  
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.



Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

## Plant/Air and Plant/Water Concentration Ratios

Mass loading [ASR(3)]: 1.000E-04 g/m\*\*3

Area Factor for Mass Loading [FA(2)]: 1.184E-01

Nuclide (i)	FAR(i,3,2,1) m**3/g	FAR(i,3,2,2) m**3/g	FWR(i,3,3,1) L/g	FWR(i,3,3,2) L/g	FWR(i,3,4,1) L/g	FWR(i,3,4,2) L/g
Pb-210	5.4545E-02	2.6156E-01	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ra-226	5.4545E-02	2.6156E-01	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Th-230	5.4545E-02	2.6156E-01	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

FAR(i,p,q,k) is the plant/air concentration ratio for airborne contaminated dust,  
and FWR(i,p,q,k) is the plant/water concentration ratio. See groundwater displays  
for water/soil concentration ratios.

## Plant/Soil Concentration Ratios, FSR(i,3,q,k,t)

Root Uptake (q=1) and Foliar Dust Deposition (q=2)  
Nonleafy (k=1) and/or Leafy (k=2) Vegetables

Nuclide (i)		FSR(i,3,1,k)	FSR(i,3,2,1)	FSR(i,3,2,2)
Parent	Product			
Pb-210	Pb-210	1.0000E-02	6.4586E-07	3.0970E-06
Ra-226	Ra-226	4.0000E-02	6.4586E-07	3.0970E-06
Ra-226	Pb-210	1.0000E-02	6.4586E-07	3.0970E-06
Th-230	Th-230	1.0000E-03	6.4586E-07	3.0970E-06
Th-230	Ra-226	4.0000E-02	6.4586E-07	3.0970E-06
Th-230	Pb-210	1.0000E-02	6.4586E-07	3.0970E-06

Plant/Soil Concentration Ratio, FSR(j,3,q,k,t)  
Ditch Irrigation (q=3)

Parent (i)	Product (j)	Branch Fraction*	FSR(j,3,3,k,t)				
			t=	0.000E+00	3.000E+02	1.000E+03	8.997E+03
Pb-210	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00



Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

## 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
Pb-210	8.0000E-04	3.0000E-04	2.8659E-01	0.0000E+00	0.0000E+00
Ra-226	1.0000E-03	1.0000E-03	2.8659E-01	0.0000E+00	0.0000E+00
Th-230	1.0000E-04	5.0000E-06	2.8659E-01	0.0000E+00	0.0000E+00

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.







Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

Meat/Soil Concentration Ratio, FSR(j,4,q,t)  
Livestock Water (q=5)

Parent (i)	Product (j)	Branch Fraction*	FSR(j,4,5,t) * SF(j,t)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00





Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

Milk/Soil Concentration Ratio, FSR(j,5,q,t)  
Livestock Water (q=5)

Parent (i)	Product (j)	Branch Fraction*	FSR(j,5,5,t) * SF(j,t)				
			t= 0.000E+00	3.000E+02	1.000E+03	8.997E+03	1.000E+04
Pb-210	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Detailed: RESRAD Default Parameters

File : Silo3\_radon\_highKd\_LIR\_LC\_0.001.RAD

## Dose/Source Ratios for Soil Ingestion Pathway (p=8)

## Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Branch Fraction*	DSR(j,8,t) (mrem/yr)/(pCi/g)				
			t=	0.000E+00	3.000E+02	1.000E+03	8.997E+03
Pb-210	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	∑DSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BR

The DSR includes contributions from associated (half-life ≤ 0.5 yr) 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) (g/yr)				
			t=	0.000E+00	3.000E+02	1.000E+03	8.997E+03
Pb-210	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

\* - The dose conversion factor units are mrem/pCi.