



**DEPARTMENT OF THE ARMY  
ST. LOUIS DISTRICT, CORPS OF ENGINEERS  
8945 LATTY AVENUE  
BERKELEY, MISSOURI 63134**

REPLY TO  
ATTENTION OF:

**CEMVS-PM-R**

**03 JANUARY 2014**

**MEMORANDUM FOR RECORD**

**SUBJECT:** Supplemental Residential Gardener Risk Characterization of Inaccessible and Property-Wide Soil Areas at the St. Louis Downtown Site (SLDS) Vicinity Properties (VPs) DT-9 Levee (Terminal Railroad Association) and DT-15 (St. Louis Metropolitan Sewer District Lift Station) for the SLDS Inaccessible Soil Operable Unit (ISOU) Administrative Record

**STATEMENT OF BASIS**

A risk characterization of the hypothetical residential gardener scenario was conducted for SLDS plant properties and industrial/commercial VPs associated with ISOU media as part of USACE's (2012) "*Remedial Investigation and Baseline Risk Assessment Report for the Inaccessible Soil Operable Unit at the St. Louis Downtown Site, St. Louis, Missouri, Final, September 20*" (ISOU RI/BRA). The risks were estimated for soil that was contaminated by past Manhattan Engineer District/Atomic Energy Commission (MED/AEC) processes that supported the nation's early atomic weapons development program. MED/AEC-related contaminants of concern (COCs) identified from the ISOU RI/BRA included radionuclides and metals. During subsequent preparation of USACE's (2013) "*Proposed Plan for No Further Action for the Inaccessible Soil Operable Unit Associated with Group 1 Properties at the St. Louis Downtown Site, St. Louis Missouri*" (ISOU PP), DT-9 Levee and DT-15, were included among a list of properties, referred to as the "Group 1 Properties," for which No Further Action is being recommended for ISOU media. Both properties are located adjacent to the Mississippi River and contain portions of the Mississippi River levee system.

In the ISOU PP, the Group 1 Properties are those properties that have no exposure pathway, are non-impacted, or the property-wide radiological cancer risk above background is within or less than the U.S. Environmental Protection Agency's (USEPA) acceptable cancer risk range of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$  for the most plausible, restrictive scenario. Property-wide cancer risks are those that include the combined risks estimated for inaccessible soil and accessible soil areas. Only radiological COCs were evaluated for Group 1 Properties because the properties are located outside the areas historically used for ore processing. The current and expected future land use established for the SLDS by USACE's (1998) Record of Decision for the St. Louis Downtown Site, Final, October, as well as by the City of St. Louis' Zoning District and Strategic Land Use Maps, is industrial. Currently, land use within a 1-mile radius of the SLDS includes a mixture of commercial, industrial and residential uses (with only one known residence existing at the SLDS). For most Group 1 Properties, the most plausible restrictive scenario evaluated in the ISOU RI/BRA is that of a residential gardener. However, for DT-9 Levee and DT-15, a recreational user of the Riverfront Trail, which runs along the top of the levee, was evaluated in the ISOU RI/BRA as the most restrictive scenario based upon the reasonably anticipated future land use of the properties.

## **RESIDENT GARDENER RISK CHARACTERIZATION OF DT-9 LEVEE AND DT-15**

During preparation of the ISOU PP, comments received from the Missouri Department of Natural Resources (MDNR) expressed concern that a risk characterization had not been performed for a residential gardener at DT-9 Levee and DT-15, which should be the basis for determining the need for action or no action at those properties. In response, the USACE has conducted residential gardener risk evaluations for DT-9 Levee and DT-15 to supplement those conducted as part of the ISOU RI/BRA. However, it is the opinion of the USACE that the two levee properties will never be redeveloped for residential land use, because such a redevelopment could compromise the structural integrity of the levee system in St. Louis. Similar to the risk evaluations performed in the RI/BRA, the U.S. Department of Energy's RESRAD computer model was used to calculate the risks. For each property, risks were estimated for inaccessible soil areas, accessible soil areas, and property-wide soil areas. Property-wide risks were calculated for each property as the area-weighted averages of the inaccessible soil and accessible soil risks.

Table 1 shows all residential gardener risks estimated for DT-9 Levee and DT-15 (which include background). Table 1 also shows the residential gardener risk ( $7.9 \times 10^{-4}$ ) estimated for SLDS background soils. The background risks were calculated based on data acquired for background soil samples collected by USACE as documented in the "*Background Soil Characterization Report for the St. Louis Downtown Site*", USACE (1999). Removal of the risk contribution from background results in net cancer risks (i.e., risks above background) for DT-9 Levee and DT-15 that are negative values. Theoretically, the net property risks are the result of MED/AEC-related contamination. Therefore, Table 1 presents "*<BKGD*" (indicating "less than background") for the risks above background presented for each property in the far right-hand column of the table.

Tables 2 and 3 provide supporting information used to calculate the risks presented in Table 1. Table 2 presents input values for RESRAD modeling parameters and Table 3 presents the property-specific exposure point concentrations for soils that were entered into the RESRAD model as source terms for SLDS background, DT-9 Levee, and DT-15. Additionally, the following RESRAD output files are attached:

- Attachment A – RESRAD Output for Radiological Cancer Risks Estimated for Resident Gardener Exposures to Inaccessible Soil at DT-9 Levee
- Attachment B - RESRAD Output for Radiological Cancer Risks Estimated for Resident Gardener Exposures to Accessible Soil at DT-9 Levee
- Attachment C - RESRAD Output for Radiological Cancer Risks Estimated for Resident Gardener Exposures to Inaccessible Soil at DT-15
- Attachment D - RESRAD Output for Radiological Cancer Risks Estimated for Resident Gardener Exposures to Accessible Soil at DT-15

RESRAD output files for SLDS background are not contained in the attachments as these are presented in the ISOU RI/BRA.

**Table 1. Sitewide and Property-Specific Radiological Risk Characterization for Inaccessible Soil and Accessible Soil at DT-9 Levee and DT-15: Hypothetical Resident Gardener (USACE Calculations)**

Property	Soil Operable Unit	Area (m <sup>2</sup> )	Maximum Risk for Resident Gardener	
			Risk with Background	Risk above Background <sup>a</sup>
95%UCL Background <sup>b</sup>	Inaccessible <sup>c</sup>	10,000	7.9E-04	NA
	Accessible <sup>c</sup>	10,000	7.9E-04	NA
	Area-Wide <sup>d</sup>	20,000	7.9E-04	NA
<i>Levee Properties</i>				
DT-9 Levee	Inaccessible <sup>c</sup>	84,920	5.1E-04	<BKGD
	Accessible <sup>c</sup>	188,158	7.5E-04	<BKGD
	Property-Wide <sup>d</sup>	273,078	6.7E-04	<BKGD
DT-15	Inaccessible <sup>c</sup>	5,505	6.5E-04	<BKGD
	Accessible <sup>c</sup>	3,754	4.9E-04	<BKGD
	Property-Wide <sup>d</sup>	9,259	5.8E-04	<BKGD

<sup>a</sup> MED/AEC-related risk above background is calculated as the difference between risk with background and background risk. The values reported in the "Background" rows, are the risks estimated for background used to calculate MED/AEC-related risk above background.

<sup>b</sup> The RESRAD default value of 10,000 m<sup>2</sup> was applied as the area of the contaminated zone for each the inaccessible soil and accessible soil areas. Property-wide background risk calculations for soil assume a total area of 20,000 m<sup>2</sup> for combined inaccessible and accessible soil areas for the industrial worker and recreational user scenarios, with 50 percent of the total background area assumed to be inaccessible soil and 50 percent of the total background area assumed to be accessible soil.

<sup>c</sup> For the resident gardener scenario, inaccessible and accessible soil risks were calculated under the assumption of no ground cover.

<sup>d</sup> Property-wide dose and risk are calculated as weighted averages of inaccessible and accessible soil dose and risk.

NA - Not applicable.

<BKGD - Indicates that dose or risk is within the range of background.

**Table 2. USACE Input Values for Non-Default Residual Radioactivity Model Parameters for Hypothetical Resident Gardener (From RI/BRA)**

Parameter	Unit	RESRAD Default <sup>a</sup>	Resident
<i>Soil Concentrations/Transport Factors</i>			
Soil Concentrations	pCi/g	NA	See Table 3
<i>Contaminated Zone Parameters</i>			
Area of Contaminated Zone	m <sup>2</sup>	10,000	See Table 1
Thickness of Contaminated Zone (All Properties)	m	2	2
<i>Cover/Hydrological Data</i>			
Cover Depth	m	0	0
Density of Contaminated Zone	g/cm <sup>3</sup>	1.5	1.28
Contaminated Zone Erosion Rate	m/year	0.001	0.00006
Contaminated Zone Total Porosity	unitless	0.40	0.42
Contaminated Zone Field Capacity	unitless	0.20	0.36
Contaminated Zone Hydraulic Conductivity	m/yr	10.00	3.048
Contaminated Zone B Parameter	unitless	5.30	10.40
Wind Speed	m/sec	2.00	4.17
Precipitation	m/yr	1.00	0.92
Irrigation	m/yr	0.20	0.00
Runoff Coefficient	unitless	0.20	0.80
<i>Occupancy Data</i>			
Inhalation Rate	m <sup>3</sup> /year	8,400	8,400
Mass Loading for Inhalation	g/m <sup>3</sup>	0.0001	5.9E-06
Indoor Dust Filtration Factor	unitless	0.4	0.5
Exposure Duration	year	30	30
Indoor Time Fraction	unitless	0.5	0.655
Outdoor Time Fraction	unitless	0.25	0.0799
<i>Ingestion Dietary Data</i>			
Fruits, Vegetables and Grain Consumption	kg/yr	160	42.7 <sup>b</sup>
Leafy Vegetable Consumption	kg/yr	14	4.66 <sup>b</sup>
Soil Ingestion Rate	g/year	36.5	43.8
<i>Pathways</i>			
External Gamma	unitless	Active	Active
Inhalation	unitless	Active	Active
Plant Ingestion	unitless	Active	Active
Meat Ingestion	unitless	Active	Suppressed
Milk Ingestion	unitless	Active	Suppressed
Aquatic Foods	unitless	Active	Suppressed
Drinking Water	unitless	Active	Suppressed
Soil Ingestion	unitless	Active	Active
Radon	unitless	Suppressed	Suppressed

<sup>a</sup> Where possible, input values for the RESRAD models equate to USEPA assumptions applied to the metals evaluations

<sup>b</sup> Non-default produce intake rates were obtained from USEPA 2000, Soil Screening Guidance for Radionuclides: User's Guide. These intake rates have been used historically in all SLDS risk evaluations.

**Table 3. Exposure Point Concentrations for Radiological Contaminants of Potential Concern for Inaccessible and Accessible Soil at DT-9 Levee and DT-15: Hypothetical Resident Gardener**

Property	Area (m <sup>2</sup> )	Operable Unit	EPCs for Radiological COPCs (pCi/g)										
			Ac-227	Pa-231	Pb-210 <sup>a</sup>	Ra-226	Ra-228	Th-228	Th-230	Th-232	U-234 <sup>a</sup>	U-235	U-238
<i>Sitewide</i>													
Background <sup>b</sup>	10,000	ISOU EPC	0.18	1.12	N/A	3.04	1.00	N/A	2.18	1.18	N/A	0.10	1.67
	10,000	Accessible EPC	0.18	1.12	N/A	3.04	1.00	1.26	2.18	1.18	N/A	0.10	1.67
<i>Levee Properties</i>													
DT-9 Levee	84,920	ISOU EPC	0.05	0.07	1.90	1.46	0.91	N/A	1.52	1.02	1.59	0.10	1.59
	188,158	Accessible EPC	0.08	0.34	3.67	2.82	0.86	1.13	2.25	0.94	2.14	0.17	2.14
DT-15	5,505	ISOU EPC	0.05	0.42	2.91	2.24	0.95	N/A	2.29	1.09	2.17	0.19	2.17
	3,754	Accessible EPC	0.05	0.20	2.33	1.79	0.72	0.91	1.87	0.76	1.38	0.03	1.38

<sup>a</sup> EPC was determined based upon Table 2.15 of the 1993 BRA (DOE 1993).

<sup>b</sup> EPCs for background soil were determined based upon 95% UCL values in Table 3-2 of the *Background Soils Characterization Report for the St. Louis Downtown Site* (USACE 1999a).

N/A - Not Available

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Intrinsic : DT-9 Levee ISOU Resident  
File : C:\RESRAD\_FAMILY\RESRAD\6.5\USERFILES\DT9 LEVEE ISOU RES.RAD

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Cancer Risk Slope Factors Summary Table  
Risk Library: HEAST 2001 Morbidity

0 Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Ac-227+D	1.47E-06	3.48E-10	SLPF( 1,1)
Sf-1	Pa-231	1.39E-07	1.39E-07	SLPF( 2,1)
Sf-1	Pb-210+D	4.21E-09	1.41E-09	SLPF( 3,1)
Sf-1	Ra-226+D	8.49E-06	2.29E-08	SLPF( 4,1)
Sf-1	Ra-228+D	4.53E-06	0.00E+00	SLPF( 5,1)
Sf-1	Th-228+D	7.76E-06	5.59E-09	SLPF( 6,1)
Sf-1	Th-230	8.19E-10	8.19E-10	SLPF( 7,1)
Sf-1	Th-232	3.42E-10	3.42E-10	SLPF( 8,1)
Sf-1	U-234	2.52E-10	2.52E-10	SLPF( 9,1)
Sf-1	U-235+D	5.43E-07	5.18E-07	SLPF( 10,1)
Sf-1	U-238	4.99E-11	4.99E-11	SLPF( 11,1)
Sf-1	U-238+D	1.14E-07	4.99E-11	SLPF( 12,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Ac-227+D	2.09E-07	1.49E-07	SLPF( 1,2)
Sf-2	Pa-231	4.55E-08	4.55E-08	SLPF( 2,2)
Sf-2	Pb-210+D	1.39E-08	2.77E-09	SLPF( 3,2)
Sf-2	Ra-226+D	1.16E-08	1.15E-08	SLPF( 4,2)
Sf-2	Ra-228+D	5.23E-09	5.18E-09	SLPF( 5,2)
Sf-2	Th-228+D	1.43E-07	1.32E-07	SLPF( 6,2)

Sf-2	Th-230	2.85E-08	2.85E-08	SLPF( 7,2)
Sf-2	Th-232	4.33E-08	4.33E-08	SLPF( 8,2)
Sf-2	U-234	1.14E-08	1.14E-08	SLPF( 9,2)
Sf-2	U-235+D	1.01E-08	1.01E-08	SLPF( 10,2)
Sf-2	U-238	9.32E-09	9.32E-09	SLPF( 11,2)
Sf-2	U-238+D	9.35E-09	9.32E-09	SLPF( 12,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF( 1,3)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF( 2,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF( 3,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF( 4,3)
Sf-3	Ra-228+D	1.43E-09	1.43E-09	SLPF( 5,3)
Sf-3	Th-228+D	4.22E-10	1.48E-10	SLPF( 6,3)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF( 7,3)
Sf-3	Th-232	1.33E-10	1.33E-10	SLPF( 8,3)
Sf-3	U-234	9.55E-11	9.55E-11	SLPF( 9,3)
Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF( 10,3)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF( 11,3)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF( 12,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	4.86E-10	2.01E-10	SLPF( 1,4)
Sf-3	Pa-231	1.73E-10	1.73E-10	SLPF( 2,4)
Sf-3	Pb-210+D	1.27E-09	8.81E-10	SLPF( 3,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF( 4,4)
Sf-3	Ra-228+D	1.04E-09	1.04E-09	SLPF( 5,4)
Sf-3	Th-228+D	3.00E-10	1.07E-10	SLPF( 6,4)
Sf-3	Th-230	9.10E-11	9.10E-11	SLPF( 7,4)

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Cancer Risk Slope Factors Summary Table (continued)  
Risk Library: HEAST 2001 Morbidity

0 Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-3	Th-232	1.01E-10	1.01E-10	SLPF( 8,4)
Sf-3	U-234	7.07E-11	7.07E-11	SLPF( 9,4)
Sf-3	U-235+D	7.18E-11	6.96E-11	SLPF( 10,4)
Sf-3	U-238	6.40E-11	6.40E-11	SLPF( 11,4)
Sf-3	U-238+D	8.71E-11	6.40E-11	SLPF( 12,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	1.16E-09	3.81E-10	SLPF( 1,5)
Sf-3	Pa-231	3.74E-10	3.74E-10	SLPF( 2,5)
Sf-3	Pb-210+D	2.66E-09	1.84E-09	SLPF( 3,5)
Sf-3	Ra-226+D	7.30E-10	7.29E-10	SLPF( 4,5)
Sf-3	Ra-228+D	2.29E-09	2.28E-09	SLPF( 5,5)

Sf-3	Th-228+D		8.09E-10	2.89E-10	SLPF( 6,5)
Sf-3	Th-230		2.02E-10	2.02E-10	SLPF( 7,5)
Sf-3	Th-232		2.31E-10	2.31E-10	SLPF( 8,5)
Sf-3	U-234		1.58E-10	1.58E-10	SLPF( 9,5)
Sf-3	U-235+D		1.63E-10	1.57E-10	SLPF( 10,5)
Sf-3	U-238		1.43E-10	1.43E-10	SLPF( 11,5)
Sf-3	U-238+D		2.10E-10	1.43E-10	SLPF( 12,5)
Sf-Rn	Radon Inhalation slope factors, 1/(pCi):				
Sf-Rn	Rn-222		1.80E-12	1.80E-12	SLPFRN(1,1)
Sf-Rn	Po-218		3.70E-12	3.70E-12	SLPFRN(1,2)
Sf-Rn	Pb-214		6.20E-12	6.20E-12	SLPFRN(1,3)
Sf-Rn	Bi-214		1.50E-11	1.50E-11	SLPFRN(1,4)
Sf-Rn	Rn-220		1.90E-13	1.90E-13	SLPFRN(2,1)
Sf-Rn	Po-216		3.00E-15	3.00E-15	SLPFRN(2,2)
Sf-Rn	Pb-212		3.90E-11	3.90E-11	SLPFRN(2,3)
Sf-Rn	Bi-212		3.70E-11	3.70E-11	SLPFRN(2,4)
Sf-Rn	Radon K factors, (mrem/WLM) :				
Sf-Rn	Rn-222 Indoor		7.60E+02	7.60E+02	KFACTR(1,1)
Sf-Rn	Rn-222 Outdoor		5.70E+02	5.70E+02	KFACTR(1,2)
Sf-Rn	Rn-220 Indoor		1.50E+02	1.50E+02	KFACTR(2,1)
Sf-Rn	Rn-220 Outdoor		2.50E+02	2.50E+02	KFACTR(2,2)

\*Base Case means Default.Lib w/o Associate Nuclide contributions.  
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In-risk : DT-9 Levee ISOU Resident  
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## Risk Slope and Environmental Transport Factors for the Ground Pathway

Po-212	0.000E+00									
Po-214	3.860E-10	5.244E-01								
Po-215	7.480E-10	5.267E-01								
Po-216	7.870E-11	5.251E-01								
Po-218	4.260E-11	5.251E-01								
Ra-223	4.340E-07	5.301E-01								
Ra-224	3.720E-08	5.301E-01								
Ra-226	2.290E-08	5.308E-01								
Ra-228	0.000E+00									
Rn-219	2.250E-07	5.289E-01								
Rn-220	1.700E-09	5.259E-01								
Rn-222	1.740E-09	5.259E-01								
Th-227	3.780E-07	5.304E-01								
Th-228	5.590E-09	5.320E-01								
Th-230	8.190E-10	5.329E-01								
Th-231	2.450E-08	5.337E-01								
Th-232	3.420E-10	5.343E-01								
Th-234	1.630E-08	5.343E-01								
Tl-207	1.520E-08	5.261E-01								
Tl-208	1.760E-05	5.248E-01								
Tl-210	0.000E+00	5.384E-01								
U-234	2.520E-10	5.341E-01								
U-235	5.180E-07	5.307E-01								
U-238	4.990E-11	5.379E-01								

\* - Units are 1/yr per (pCi/g) at infinite depth and area. Multiplication by ETFG(i,t) converts to site conditions.

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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t = 0.000E+00 years

Radio-Nuclide	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total Ingestion*
	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	
Ac-227	1.066E-04	2.961E+00	0.000E+00	0.000E+00	1.609E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.570E+00
Pa-231	1.493E-04	1.658E+01	0.000E+00	0.000E+00	2.253E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.883E+01
Pb-210	4.051E-03	4.500E+02	0.000E+00	0.000E+00	6.116E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.111E+02
Ra-226	3.113E-03	1.383E+03	0.000E+00	0.000E+00	4.700E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.430E+03
Ra-228	1.940E-03	8.620E+02	0.000E+00	0.000E+00	2.929E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.913E+02
Th-228	0.000E+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	0.000E+00	0.000E+00
Th-230	3.241E-03	3.602E+01	0.000E+00	0.000E+00	4.893E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.495E+01
Th-232	2.175E-03	2.417E+01	0.000E+00	0.000E+00	3.283E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.701E+01
U-234	3.390E-03	9.416E+01	0.000E+00	0.000E+00	5.118E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.453E+02
U-235	2.132E-04	5.922E+00	0.000E+00	0.000E+00	3.219E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.141E+00
U-238	3.390E-03	9.416E+01	0.000E+00	0.000E+00	5.118E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.453E+02

\* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil

and water-dependent water, fish, plant, meat, milk pathways

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of  
Radon and its Decay Products as pCi/yr at t= 0.000E+00 years  
Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependent  
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Intrinsic : DT-9 Levee ISOU Resident  
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 0.000E+00 years

Radio- Nuclide	Water Independent Pathways (Inhalation excludes radon)											
	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.300E-06	0.0026	7.454E-10	0.0000	6.506E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	6.264E-08	0.0001
Pa-231	1.526E-07	0.0003	2.016E-10	0.0000	1.112E-07	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.502E-08	0.0001
Pb-210	1.165E-07	0.0002	1.542E-09	0.0000	4.259E-05	0.0863	0.000E+00	0.0000	0.000E+00	0.0000	4.462E-06	0.0090
Ra-226	1.937E-04	0.3923	1.072E-09	0.0000	2.120E-05	0.0429	0.000E+00	0.0000	0.000E+00	0.0000	1.022E-06	0.0021
Ra-228	7.048E-05	0.1428	3.303E-10	0.0000	4.003E-05	0.0811	0.000E+00	0.0000	0.000E+00	0.0000	2.179E-06	0.0044
Th-228	1.094E-04	0.2216	8.160E-09	0.0000	4.123E-07	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	6.985E-07	0.0014
Th-230	1.990E-08	0.0000	2.771E-09	0.0000	1.286E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	2.965E-07	0.0006
Th-232	5.592E-09	0.0000	2.825E-09	0.0000	9.645E-08	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.275E-07	0.0005
U-234	6.352E-09	0.0000	1.147E-09	0.0000	2.669E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	2.400E-07	0.0005
U-235	8.547E-07	0.0017	6.393E-11	0.0000	1.716E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.561E-08	0.0000
U-238	2.824E-06	0.0057	9.409E-10	0.0000	3.371E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	3.190E-07	0.0006
Total	3.788E-04	0.7674	1.980E-08	0.0000	1.053E-04	0.2132	0.000E+00	0.0000	0.000E+00	0.0000	9.548E-06	0.0193

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 0.000E+00 years

#### Water Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Ac-227	0.000E+00	0.0000	1.429E-06	0.0029								
Pa-231	0.000E+00	0.0000	2.891E-07	0.0006								

Pb-210	0.000E+00	0.0000	4.717E-05	0.0955								
Ra-226	0.000E+00	0.0000	2.159E-04	0.4374								
Ra-228	0.000E+00	0.0000	1.127E-04	0.2283								
Th-228	0.000E+00	0.0000	1.105E-04	0.2239								
Th-230	0.000E+00	0.0000	4.478E-07	0.0009								
Th-232	0.000E+00	0.0000	3.324E-07	0.0007								
U-234	0.000E+00	0.0000	5.144E-07	0.0010								
U-235	0.000E+00	0.0000	8.875E-07	0.0018								
U-238	0.000E+00	0.0000	3.481E-06	0.0071								
Total	0.000E+00	0.0000	4.937E-04	1.0000								

\*\* Sum of water independent ground, inhalation, plant, meat, milk, soil  
and water dependent water, fish, plant, meat, milk pathways

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
Radon and its Decay Products at t= 0.000E+00 years  
Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent    Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction cf Total Risk at t= 0.000E+00 years

Radio-Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	7.334E-07	0.0015	4.204E-10	0.0000	0.000E+00	0.0000	3.554E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	3.533E-08	0.0001
Pa-231	7.194E-07	0.0015	5.264E-10	0.0000	0.000E+00	0.0000	1.397E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	5.231E-08	0.0001
Pb-210	8.253E-08	0.0002	1.093E-09	0.0000	0.000E+00	0.0000	3.309E-05	0.0609	0.000E+00	0.0000	0.000E+00	0.0000	3.161E-06	0.0064
Ra-226	1.924E-04	0.3898	1.512E-09	0.0000	0.000E+00	0.0000	3.349E-05	0.0679	0.000E+00	0.0000	0.000E+00	0.0000	2.310E-06	0.0047
Ra-228	4.684E-05	0.0949	2.277E-09	0.0000	0.000E+00	0.0000	1.004E-05	0.0203	0.000E+00	0.0000	0.000E+00	0.0000	7.263E-07	0.0015
Th-230	1.328E-06	0.0027	2.780E-09	0.0000	0.000E+00	0.0000	3.320E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	3.096E-07	0.0006
Th-232	1.330E-04	0.2695	9.038E-09	0.0000	0.000E+00	0.0000	3.350E-05	0.0618	0.000E+00	0.0000	0.000E+00	0.0000	2.379E-06	0.0048
U-234	6.477E-09	0.0000	1.147E-09	0.0000	0.000E+00	0.0000	2.569E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	2.400E-07	0.0005
U-235	8.549E-07	0.0017	6.412E-11	0.0000	0.000E+00	0.0000	1.722E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.563E-08	0.0000
U-238	2.824E-06	0.0057	9.409E-10	0.0000	0.000E+00	0.0000	3.371E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	3.190E-07	0.0006
Total	3.788E-04	0.7674	1.980E-08	0.0000	0.000E+00	0.0000	1.053E-04	0.2132	0.000E+00	0.0000	0.000E+00	0.0000	9.548E-06	0.0193

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Total Excess Cancer Risk CNRS(i,p,-)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t = 0.000E+00 years

## Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Radio-Nuclide	risk	fract.	risk	fract.										
Ac-227	0.000E+00	0.0000	8.057E-07	0.0016										
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	0.000E+00	0.0000	9.119E-07	0.0018
Pb-210	0.000E+00	0.0000	3.333E-05	0.0675										
Ra-226	0.000E+00	0.0000	0.000E+00	0.C000	2.282E-04	0.4623								
Ra-228	0.000E+00	0.0000	5.761E-05	0.1167										
Th-230	0.000E+00	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.972E-06	0.0040
Th-232	0.000E+00	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.659E-04	0.3361
U-234	0.000E+00	0.0000	5.146E-07	0.0010										
U-235	0.00CE+00	0.0000	0.000E+00	0.0000	8.878E-07	0.0018								
U-238	0.00CE+00	0.0000	0.000E+00	0.0000	0.000E+03	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.481E-06	0.0071
Total	0.000E+00	0.0000	4.937E-04	1.0000										

\*\*\*CNRSI(i,p,t) includes contribution from decay daughter radionuclides  
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t = 1.000E+00 years

\* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil  
and water-dependent water, fish, plant, meat, milk pathways

0  
Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of  
Radon and its Decay Products as pCi/yr at t= 1.000E+00 years  
0 Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.0000E+00							
Water-dep.	0.0000E+00							
Total	0.0000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependent  
RESRAD, Version 6.5      T½ Limit = 180 days      11/05/2013 15:07 Page 10  
Intrinsic : DT-9 Levee ISOU Resident  
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 1.000E+00 years												
Water Independent Pathways (Inhalation excludes radon)												
Radio-Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.308E-06	0.0026	7.497E-10	0.0000	6.543E-08	0.0001	0.0000E+00	0.0000	0.0000E+00	0.0000	6.300E-08	0.0001
Pa-231	1.525E-07	0.0003	2.014E-10	0.0000	1.111E-07	0.0002	0.0000E+00	0.0000	0.0000E+00	0.0000	2.500E-08	0.0001
Pb-210	1.159E-07	0.0002	1.534E-09	0.0000	4.236E-05	0.0852	0.0000E+00	0.0000	0.0000E+00	0.0000	4.438E-05	0.0089
Ra-226	1.936E-04	0.3893	1.072E-09	0.0000	2.119E-05	0.0426	0.0000E+00	0.0000	0.0000E+00	0.0000	1.022E-06	0.0021
Ra-228	7.071E-05	0.1422	3.313E-10	0.0000	4.017E-05	0.0808	0.0000E+00	0.0000	0.0000E+00	0.0000	2.186E-06	0.0044
Th-228	1.129E-04	0.2271	8.422E-09	0.0000	4.221E-07	0.0008	0.0000E+00	0.0000	0.0000E+00	0.0000	7.209E-07	0.0014
Th-230	1.990E-08	0.0000	2.771E-09	0.0000	1.286E-07	0.0003	0.0000E+00	0.0000	0.0000E+00	0.0000	2.965E-07	0.0006
Th-232	5.592E-09	0.0000	2.825E-09	0.0000	9.645E-08	0.0002	0.0000E+00	0.0000	0.0000E+00	0.0000	2.275E-07	0.0005
U-234	6.348E-09	0.0000	1.146E-09	0.0000	2.667E-07	0.0005	0.0000E+00	0.0000	0.0000E+00	0.0000	2.398E-07	0.0005
U-235	8.541E-07	0.0017	6.388E-11	0.0000	1.715E-08	0.0000	0.0000E+00	0.0000	0.0000E+00	0.0000	1.560E-08	0.0000
U-238	2.822E-06	0.0057	9.402E-10	0.0000	3.368E-07	0.0007	0.0000E+00	0.0000	0.0000E+00	0.0000	3.188E-07	0.0006
Total	3.825E-04	0.7693	2.006E-08	0.0000	1.052E-04	0.2115	0.0000E+00	0.0000	0.0000E+00	0.0000	9.553E-06	0.0192

0  
Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways												
Radio-Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Ac-227	0.0000E+00	0.0000	1.437E-06	0.0029								

Pa-231	0.000E+00	0.0000	2.889E-07	0.0006								
Pb-210	0.000E+00	0.0000	4.691E-05	0.0944								
Ra-226	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	2.158E-04	0.4340
Ra-228	0.000E+00	0.0000	1.131E-04	0.2274								
Th-228	0.000E+00	0.0000	1.141E-04	0.2294								
Th-230	0.000E+00	0.0000	4.478E-07	0.0009								
Th-232	0.000E+00	0.0000	3.324E-07	0.0007								
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.300E+00	0.0000	0.000E+00	0.0000	5.140E-07	0.0010
U-235	0.000E+00	0.0000	8.869E-07	0.0018								
U-238	0.000E+00	0.0000	3.478E-06	0.0070								
Total	0.000E+00	0.0000	4.972E-04	1.0000								

\*\* Sum of water independent ground, inhalation, plant, meat, milk, soil  
and water dependent water, fish, plant, meat, milk pathways

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
Radon and its Decay Products at t= 1.000E+00 years

Radionuclides								
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent    Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)												
Radio-Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	7.092E-07	0.0014	4.065E-10	0.0000	0.000E+00	0.0000	3.533E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	7.510E-07	0.0015	5.444E-10	0.0000	0.000E+00	0.0000	1.412E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000
Pb-210	7.997E-08	0.0002	1.059E-09	0.0000	0.000E+00	0.0000	2.916E-05	0.0586	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	1.922E-04	0.3866	1.537E-09	0.0000	0.000E+00	0.0000	3.417E-05	0.0687	0.000E+00	0.0000	0.000E+00	0.0000
Ra-228	4.441E-05	0.0893	2.234E-09	0.0000	0.000E+00	0.0000	8.903E-06	0.0179	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	1.414E-06	0.0028	2.781E-09	0.0000	0.000E+00	0.0000	3.472E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	1.392E-04	0.2800	9.344E-09	0.0000	0.000E+00	0.0000	3.178E-05	0.0639	0.000E+00	0.0000	0.000E+00	0.0000
U-234	6.486E-09	0.0000	1.147E-09	0.0000	0.000E+00	0.0000	2.667E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000
U-235	8.543E-07	0.0017	6.409E-11	0.0000	0.000E+00	0.0000	1.721E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	2.822E-06	0.0057	9.403E-10	0.0000	0.000E+00	0.0000	3.368E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000

Total 3.825E-04 0.7693 2.006E-08 0.0000 0.000E+00 0.0000 1.052E-04 0.2115 0.000E+00 0.0000 0.000E+00 0.0000 9.553E-06 0.0192  
 RESRAD, Version 6.5 T<sub>1/2</sub> Limit = 180 days 11/05/2013 15:07 Page 12  
 Intrisk : DT-9 Levee ISOU Resident  
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Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
 and Fraction of Total Risk at t= 1.000E+00 years

#### Water Dependent Pathways

Radio-Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.										
Ac-227	0.000E+00	0.0000	7.791E-07	0.0016										
Pa-231	0.000E+00	0.0000	9.466E-07	0.0019										
Pb-210	0.000E+00	0.0000	3.230E-05	0.0650										
Ra-226	0.000E+00	0.0000	2.288E-04	0.4601										
Ra-228	0.000E+00	0.0000	5.398E-05	0.1086										
Th-230	0.000E+00	0.0000	2.075E-06	0.0042										
Th-232	0.000E+00	0.0000	1.735E-04	0.3489										
U-234	0.000E+00	0.0000	5.142E-07	0.0010										
U-235	0.000E+00	0.0000	8.872E-07	0.0018										
U-238	0.000E+00	0.0000	3.478E-06	0.0070										
Total	0.000E+00	0.0000	4.972E-04	1.0000										

\*\*\*CNRSI(i,p,t) includes contribution from decay daughter radionuclides  
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 Intrisk : DT-9 Levee ISOU Resident  
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 As pCi/yr at t= 3.000E-00 years

Radio-Nuclide	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total Ingestion*	
	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk		
Ac-227	1.099E-04	3.067E+00	0.000E+00	0.000E+00	1.660E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.727E+00	
Pa-231	1.489E-04	1.654E+01	0.000E+00	0.000E+00	2.248E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.879E+01	
Pb-210	3.963E-03	4.413E+02	0.000E+00	0.000E+00	5.983E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.012E+02	
Ra-226	3.108E-03	1.381E+03	0.000E+00	0.000E+00	4.693E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.428E+03	
Ra-228	2.009E-03	8.885E+02	0.000E+00	0.000E+00	3.033E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.189E+02	
Th-228	1.314E-03	2.548E+01	0.000E+00	0.000E+00	1.984E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.532E+01	
Th-230	3.241E-03	3.602E+01	0.000E+00	0.000E+00	4.893E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.495E+01	
Th-232	2.175E-03	2.417E+01	0.000E+00	0.000E+00	3.283E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.700E+01	
Th-234	3.383E-03	9.396E+01	0.000E+00	0.000E+00	5.107E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.450E+02	
U-235	2.128E-04	5.909E+00	0.000E+00	0.000E+00	3.212E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.121E+00	
U-238	3.383E-03	9.396E+01	0.000E+00	0.000E+00	5.107E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.450E+02	

\* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil and water-dependent water, fish, plant, meat, milk pathways

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of Radon and its Decay Products as pCi/yr at t= 3.000E+00 years  
Radionuclides

Water-ind. == Water-independent      Water-dep. == Water-dependent  
RESRAD, Version 6.5      T<sub>1/2</sub> Limit = 130 days      11/05/2013 15:07 Page 14  
Intrisk : DT-9 Levee ISOU Resident  
File : C:\RESRAD FAMILY\RESRAD\6.5\USERFILES\DT9 LEVEE ISOU RES.RAD

Excess Cancer Risks CNRS(*i,p,t*) for Individual Radionuclides (*i*) and Pathways (*p*)  
and Fraction of Total Risk at *t*= 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.322E-06	0.0026	7.578E-10	0.0000	6.614E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	6.368E-08	0.0001
Pa-231	1.523E-07	0.0003	2.012E-10	0.0000	1.110E-07	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.496E-08	0.0000
Pb-210	1.147E-07	0.0002	1.518E-09	0.0000	4.192E-05	0.0836	0.000E+00	0.0000	0.000E+00	0.0000	4.392E-06	0.0088
Ra-226	1.934E-04	0.3855	1.071E-09	0.0000	2.117E-05	0.0422	0.000E+00	0.0000	0.000E+00	0.0000	1.021E-06	0.0020
Ra-228	7.110E-05	0.1417	3.331E-10	0.0000	4.039E-05	0.0805	0.000E+00	0.0000	0.000E+00	0.0000	2.198E-06	0.0044
Th-228	1.174E-04	0.2340	8.755E-09	0.0000	4.339E-07	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	7.494E-07	0.0015
Th-230	1.990E-08	0.0000	2.771E-09	0.0000	1.286E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	2.965E-07	0.0006
Th-232	5.592E-09	0.0000	2.825E-09	0.0000	9.645E-08	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.275E-07	0.0005
U-234	6.339E-09	0.0000	1.145E-09	0.0000	2.663E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	2.395E-07	0.0005
U-235	8.528E-07	0.0017	6.379E-11	0.0000	1.713E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.557E-08	0.0000
U-238	2.818E-06	0.0056	9.389E-10	0.0000	3.364E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	3.183E-07	0.0000
Total	3.871E-04	0.7718	2.038E-08	0.0000	1.049E-04	0.2092	0.000E+00	0.0000	0.000E+00	0.0000	9.546E-06	0.0190

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t = 3.000E+00 years

## Water Dependent Pathways

Ac-227	0.000E+00	0.0000	1.453E-06	0.0029								
Pa-231	0.000E+00	0.0000	2.885E-07	0.0006								
Pb-210	0.000E+00	0.0000	4.642E-05	0.0925								
Ra-226	0.000E+00	0.0000	2.156E-04	0.4298								
Ra-228	0.000E+00	0.0000	1.137E-04	0.2266								
Th-228	0.000E+00	0.0000	1.186E-04	0.2363								
Th-230	0.000E+00	0.0000	4.478E-07	0.0009								
Th-232	0.000E+00	0.0000	3.324E-07	0.0007								
U-234	0.000E+00	0.0000	5.133E-07	0.0010								
U-235	0.000E+00	0.0000	8.856E-07	0.0018								
U-238	0.000E+00	0.0000	3.473E-06	0.0069								
Total	0.000E+00	0.0000	5.016E-04	1.0000								

\*\* Sum of water independent ground, inhalation, plant, meat, milk, soil  
and water dependent water, fish, plant, meat, milk pathways

RESRAD, Version 6.5      T½ Limit = 180 days      11/05/2013 15:07 Page 15

Intrinsic : DT-9 Levee ISOU Resident  
File : C:\RESRAD\_FAMILY\RESRAD\6.5\USERFILES\DT9 LEVEE ISOU RES.RAD

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
Radon and its Decay Products at t= 3.000E+00 years  
Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+00 years  
Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	6.631E-07	0.0013	3.801E-10	0.0000	0.000E+00	0.0000	3.304E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	3.194E-08	0.0001
Pa-231	8.110E-07	0.0016	5.787E-10	0.0000	0.000E+00	0.0000	1.440E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	5.668E-08	0.0001
Pb-210	7.510E-08	0.0001	9.943E-10	0.0000	0.000E+00	0.0000	2.738E-05	0.0546	0.000E+00	0.0000	0.000E+00	0.0000	2.877E-06	0.0057
Ra-226	1.919E-04	0.3825	1.583E-09	0.0000	0.000E+00	0.0000	3.545E-05	0.0707	0.000E+00	0.0000	0.000E+00	0.0000	2.519E-06	0.0050
Ra-228	3.808E-05	0.0759	1.994E-09	0.0000	0.000E+00	0.0000	6.997E-06	0.0139	0.000E+00	0.0000	0.000E+00	0.0000	5.403E-07	0.0011
Th-230	1.587E-06	0.0032	2.782E-09	0.0000	0.000E+00	0.0000	3.786E-07	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	3.129E-07	0.0006
Th-232	1.504E-04	0.2998	9.919E-09	0.0000	0.000E+00	0.0000	3.392E-05	0.0676	0.000E+00	0.0000	0.000E+00	0.0000	2.635E-06	0.0053
U-234	6.505E-09	0.0000	1.145E-09	0.0000	0.000E+00	0.0000	2.664E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	2.395E-07	0.0005
U-235	8.532E-07	0.0017	6.404E-11	0.0000	0.000E+00	0.0000	1.720E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.560E-08	0.0000
U-238	2.818E-06	0.0056	9.389E-10	0.0000	0.000E+00	0.0000	3.364E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	3.184E-07	0.0006

Total 3.871E-04 0.7718 2.038E-08 0.0000 0.000E+00 0.0000 1.049E-04 0.2092 0.000E+00 0.0000 0.000E+00 0.0000 9.546E-06 0.0190  
RESRAD, Version 6.5 T<sub>4</sub> Limit = 180 days 11/05/2013 15:07 Page 16  
Intrinsic : DT-9 Levee ISOU Resident  
File : C:\RESRAD FAMILY\RESRAD\6.5\USERFILES\DT9 LEVEE ISOU RES.RAD

Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t = 3.000E+00 years

## Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Radio-Nuclide	risk	fract.	risk	fract.										
Ac-227	0.000E+00	0.0000	7.284E-07	0.0015										
Pa-231	0.000E+00	0.0000	1.012E-06	0.0020										
Pb-210	0.000E+00	0.0000	3.033E-05	0.0605										
Ra-226	0.000E+00	0.0000	2.298E-04	0.4582										
Ra-228	0.000E+00	0.0000	4.562E-05	0.0909										
Th-230	0.000E+00	0.0000	2.282E-06	0.0045										
Th-232	0.000E+00	0.0000	1.869E-04	0.3727										
U-234	0.000E+00	0.0000	5.135E-07	0.0010										
U-235	0.000E+00	0.0000	8.860E-07	0.0018										
U-238	0.000E+00	0.0000	3.473E-06	0.0069										
Total	0.000E+00	0.0000	5.016E-04	1.0000										

\*\*\*CNRSI(i,p,t) includes contribution from decay daughter radionuclides  
RESRAD, Version 6.5 T<sub>1/2</sub> Limit = 180 days 11/05/2013 15:07 Page 17  
Intrisk : DT-3 Levee ISOU Resident  
File : C:\RESRAD\DATA\INSTRU\RESRAD6.5\ISOU\DT3\ISOU.DAT RES.DAT

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/hr at t = 1.000E+01 years

U-238	3.366E-03	9.349E+01	0.000E+00	0.000E+00	5.082E+01	0.000E+00	0.C00E+00	0.000E+00	0.000E+00	0.000E+00	1.443E-02
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\* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil and water-dependent water, fish, plant, meat, milk pathways

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of Radon and its Decay Products as pCi/yr at t = 1.000E+01 years  
Radionuclides

Water-ind. == Water-independent      Water-dep. == Water-dependent  
RESRAD, Version 6.5      T<sub>1/2</sub> Limit = 180 days      11/05/2013 15:07 Page 18  
Intrisk : DT-9 Levee ISOU Resident  
File : C:\RESRAD FAMILY\RESRAD\6.5\USERFILES\DT9 LEVEE ISOU RES.RAD

Excess Cancer Risks CNRS(*i,p,t*) for Individual Radionuclides (*i*) and Pathways (*p*)  
and Fraction of Total Risk at  $t = 1.000E+01$  years

Radio- Nuclide	Water Independent Pathways (Inhalation excludes radon)											
	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.364E-06	0.0027	7.817E-10	0.0000	6.821E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	6.568E-08	0.0001
Pa-231	1.516E-07	0.0003	2.002E-10	0.0000	1.104E-07	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.484E-08	0.0000
Pb-210	1.109E-07	0.0002	1.469E-09	0.0000	4.056E-05	0.0802	0.000E+00	0.0000	0.000E+00	0.0000	4.249E-06	0.0084
Ra-226	1.927E-04	0.3810	1.067E-09	0.0000	2.110E-05	0.0417	0.000E+00	0.0000	0.000E+00	0.0000	1.017E-06	0.0020
Ra-228	7.190E-05	0.1421	3.369E-10	0.0000	4.084E-05	0.0807	0.000E+00	0.0000	0.000E+00	0.0000	2.223E-06	0.0044
Th-228	1.224E-04	0.2420	9.132E-09	0.0000	4.479E-07	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	7.817E-07	0.0013
Th-230	1.990E-08	0.0000	2.771E-09	0.0000	1.286E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	2.965E-07	0.0000
Th-232	5.592E-09	0.0000	2.825E-09	0.0000	9.645E-08	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.275E-07	0.0004
U-234	6.307E-09	0.0000	1.139E-09	0.0000	2.650E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	2.383E-07	0.0003
U-235	8.486E-07	0.0017	6.347E-11	0.0000	1.704E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.550E-08	0.0000
U-238	2.804E-06	0.0055	9.342E-10	0.0000	3.347E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	3.168E-07	0.0000
Total	3.924E-04	0.7757	2.072E-08	0.0000	1.040E-04	0.2055	0.000E+00	0.0000	0.000E+00	0.0000	9.456E-06	0.0187

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 and Fraction of Total Risk at t= 1.000E+01 years

### Water Dependent Pathways

Ac-227	0.000E+00	0.0000	1.498E-06	0.0030								
Pa-231	0.000E+00	0.0000	2.870E-07	0.0006								
Pb-210	0.000E+00	0.0000	4.492E-05	0.0888								
Ra-226	0.000E+00	0.0000	2.149E-04	0.4248								
Ra-228	0.000E+00	0.0000	1.150E-04	0.2273								
Th-228	0.000E+00	0.0000	1.237E-04	0.2445								
Th-230	0.000E+00	0.0000	4.478E-07	0.0009								
Th-232	0.000E+00	0.0000	3.324E-07	0.0007								
U-234	0.000E+00	0.0000	5.107E-07	0.0010								
U-235	0.000E+00	0.0000	8.812E-07	0.0017								
U-238	0.000E+00	0.0000	3.456E-06	0.0068								
Total	0.000E+00	0.0000	5.058E-04	1.0000								

\*\* Sum of water independent ground, inhalation, plant, meat, milk, soil  
and water dependent water, fish, plant, meat, milk pathways

RESRAD, Version 6.5      T½ Limit = 180 days      11/05/2013 15:07 Page 19  
Intrisk : DT-9 Levee ISOU Resident  
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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
Radon and its Decay Products at t= 1.000E+01 years

Radionuclides								
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+01 years  
Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground		Inhalation		Racon		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	5.241E-07	0.0010	3.004E-10	0.0000	0.000E+00	0.0000	2.611E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	2.524E-08	0.0000
Pa-231	9.907E-07	0.0020	6.811E-10	0.0000	0.000E+00	0.0000	1.524E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	6.524E-08	0.0001
Pb-210	6.026E-08	0.0001	7.978E-10	0.0000	0.000E+00	0.0000	2.197E-05	0.0434	0.000E+00	0.0000	0.000E+00	0.0000	2.308E-06	0.0046
Ra-226	1.906E-04	0.3768	1.721E-09	0.0000	0.000E+00	0.0000	3.932E-05	0.0777	0.000E+00	0.0000	0.000E+00	0.0000	2.933E-06	0.0058
Ra-228	1.813E-05	0.0358	9.896E-10	0.0000	0.000E+00	0.0000	3.003E-06	0.0059	0.000E+00	0.0000	0.000E+00	0.0000	2.431E-07	0.0005
Th-230	2.191E-06	0.0043	2.787E-09	0.0000	0.000E+00	0.0000	4.969E-07	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	3.215E-07	0.0006
Th-232	1.762E-04	0.3483	1.130E-08	0.0000	0.000E+00	0.0000	3.838E-05	0.0759	0.000E+00	0.0000	0.000E+00	0.0000	2.989E-06	0.0059
U-234	6.596E-09	0.0000	1.139E-09	0.0000	0.000E+00	0.0000	2.651E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	2.384E-07	0.0005
U-235	8.491E-07	0.0017	6.385E-11	0.0000	0.000E+00	0.0000	1.714E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.553E-08	0.0000

U-238 2.804E-06 0.0055 9.343E-10 0.0000 0.000E+00 0.0000 3.347E-07 0.0007 0.000E+00 0.0000 0.000E+00 0.0000 3.168E-07 0.0006

Total 3.924E-04 0.7757 2.072E-08 0.0000 0.000E+00 0.0000 1.C40E-04 0.2055 0.000E+00 0.0000 0.000E+00 0.0000 9.456E-06 0.0187

RESRAD, Version 6.5 T<sub>1/2</sub> Limit = 180 days 11/05/2013 15:07 Page 20

Intrinsic : DT-9 Levee ISOU Resident

File : C:\RESRAD\_FAMILY\RESRAD\6.5\USERFILES\DT9 LEVEE ISOU RES.RAD

Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+01 years

#### Water Dependent Pathways

Radio-Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.										
Ac-227	0.000E+00	0.0000	5.757E-07	0.0011										
Pa-231	0.000E+00	0.0000	1.209E-06	0.0024										
Pb-210	0.000E+00	0.0000	2.434E-05	0.0481										
Ra-226	0.000E+00	0.0000	2.329E-04	0.4604										
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	0.000E+00	0.0000	2.138E-05	0.0423
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	0.000E+00	0.0000	3.012E-06	0.0060
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	0.000E+00	0.0000	2.176E-04	0.4302
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000G	0.000E+00	0.0000	0.000E+00	0.0000	5.111E-07	0.0010
U-235	0.000E+00	0.0000	8.818E-07	0.0017										
U-238	0.000E+00	0.0000	3.456E-06	0.0068										
Total	0.000E+00	0.0000	5.058E-04	1.0000										

\*\*\*CNRSI(i,p,t) includes contribution from decay daughter radioruclides  
RESRAD, Version 6.5 T<sub>1/2</sub> Limit = 180 days 11/05/2013 15:07 Page 21  
Intrinsic : DT-9 Levee ISOU Resident  
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t= 3.000E+01 years

Radio-Nuclide	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total Ingestion*	
	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk		
Ac-227	1.276E-04	3.558E+00	0.000E+00	0.000E+00	1.926E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.484E+00	
Pa-231	1.461E-04	1.623E+01	0.000E+00	0.000E+00	2.206E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.844E+01	
Pb-210	3.441E-03	3.833E+02	0.000E+00	0.000E+00	5.194E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.352E+02	
Ra-226	3.068E-03	1.363E+03	0.000E+00	0.000E+00	4.631E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.409E+03	
Ra-228	2.160E-03	9.555E+02	0.000E+00	0.000E+00	3.260E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.881E+02	
Th-228	2.157E-03	3.567E+01	0.000E+00	0.000E+00	3.256E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.822E+01	
Th-230	3.241E-03	3.602E+01	0.000E+00	0.000E+00	4.893E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.495E+01	
Th-232	2.175E-03	2.417E+01	0.000E+00	0.000E+00	3.283E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.700E+01	
U-234	3.318E-03	9.216E+01	0.000E+00	0.000E+00	5.009E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.423E+02	

\* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil and water-dependent water, fish, plant, meat, milk pathways

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of Radon and its Decay Products as pCi/yr at t = 3.000E+01 years  
Radionuclides

Water-ind. == Water-independent      Water-dep. == Water-dependent  
RESRAD, Version 6.5      T<sub>1/2</sub> Limit = 180 days      11/05/2013 15:07 Page 22  
Intrisk : DT-9 Levee ISOU Resident  
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Excess Cancer Risks CNRS(*i,p,t*) for Individual Radionuclides (*i*) and Pathways (*p*)  
and Fraction of Total Risk at *t* = 3.000E+01 years

Ground		Inhalation		Plant		Meat		Milk		Soil		
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.433E-06	0.0028	8.213E-10	0.0000	7.165E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	6.902E-08	0.0000
Pa-231	1.495E-07	0.0003	1.974E-10	0.0000	1.089E-07	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.449E-08	0.0000
Pb-210	1.036E-07	0.0002	1.371E-09	0.0000	3.787E-05	0.0752	0.000E+00	0.0000	0.000E+00	0.0000	3.967E-06	0.007
Ra-226	1.909E-04	0.3792	1.057E-09	0.0000	2.089E-05	0.0415	0.000E+00	0.0000	0.000E+00	0.0000	1.007E-06	0.002
Ra-228	7.245E-05	0.1439	3.395E-10	0.0000	4.116E-05	0.0818	0.000E+00	0.0000	0.000E+00	0.0000	2.240E-06	0.004
Th-228	1.241E-04	0.2466	9.257E-09	0.0000	4.532E-07	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	7.924E-07	0.001
Th-230	1.990E-08	0.0000	2.771E-09	0.0000	1.286E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	2.965E-07	0.000
Th-232	5.592E-09	0.0000	2.825E-09	0.0000	9.645E-08	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.275E-07	0.000
U-234	6.217E-09	0.0000	1.123E-09	0.0000	2.612E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	2.349E-07	0.000
U-235	8.365E-07	0.0017	6.257E-11	0.0000	1.680E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.528E-08	0.000
U-238	2.764E-06	0.0055	9.209E-10	0.0000	3.299E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	3.123E-07	0.000
Total	3.927E-04	0.7803	2.075E-08	0.0000	1.014E-04	0.2014	0.000E+00	0.0000	0.000E+00	0.0000	9.187E-06	0.018

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t = 3.000E+01 years

### Water Dependent Pathways

Nuclide	risk	fract.										
Ac-227	0.000E+00	0.0000	1.574E-06	0.0031								
Pa-231	0.000E+00	0.0000	2.830E-07	0.0006								
Pb-210	0.000E+00	0.0000	4.194E-05	0.0833								
Ra-226	0.000E+00	0.0000	2.128E-04	0.4227								
Ra-228	0.000E+00	0.0000	1.158E-04	0.2302								
Th-228	0.000E+00	0.0000	1.254E-04	0.2490								
Th-230	0.000E+00	0.0000	4.478E-07	0.0009								
Th-232	0.000E+00	0.0000	3.324E-07	0.0007								
U-234	0.000E+00	0.0000	5.035E-07	0.0010								
U-235	0.000E+00	0.0000	8.687E-07	0.0017								
U-238	0.000E+00	0.0000	3.407E-06	0.0068								
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	C.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.033E-04	1.0000

\*\* Sum of water independent ground, inhalation, plant, meat, milk, soil  
and water dependent water, fish, plant, meat, milk pathways

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Intrinsic : DT-9 Levee ISOU Resident  
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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
Radon and its Decay Products at t= 3.000E+01 years  
Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+01 years

Radio-Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.676E-07	0.0005	1.534E-10	0.0000	0.000E+00	0.0000	1.333E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.289E-08	0.0000
Pa-231	1.314E-06	0.0026	8.645E-10	0.0000	0.000E+00	0.0000	1.670E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	8.054E-08	0.0002
Pb-210	3.213E-08	0.0001	4.254E-10	0.0000	0.000E+00	0.0000	1.172E-05	0.0233	0.000E+00	0.0000	0.000E+00	0.0000	1.231E-06	0.0024
Ra-226	1.871E-04	0.3717	1.969E-09	0.0000	0.000E+00	0.0000	4.629E-05	0.0920	0.000E+00	0.0000	0.000E+00	0.0000	3.688E-06	0.0073
Ra-228	1.647E-06	0.0033	9.063E-11	0.0000	0.000E+00	0.0000	2.668E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	2.183E-08	0.0000
Th-230	3.894E-06	0.0077	2.803E-09	0.0000	0.000E+00	0.0000	8.866E-07	0.0018	0.000E+00	0.0000	0.000E+00	0.0000	3.517E-07	0.0007
Th-232	1.949E-04	0.3872	1.233E-08	0.0000	0.000E+00	0.0000	4.144E-05	0.0823	0.000E+00	0.0000	0.000E+00	0.0000	3.238E-05	0.0064
U-234	7.072E-09	0.0000	1.124E-09	0.0000	0.000E+00	0.0000	2.614E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	2.350E-07	0.0005

U-235	8.378E-07	0.0017	6.341E-11	0.0000	0.000E+00	0.0000	1.700E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.536E-08	0.0000
U-238	2.764E-06	0.0055	9.211E-10	0.0000	0.000E+00	0.0000	3.300E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	3.123E-07	0.0006

```
Total 3.927E-04 0.7803 2.075E-08 0.0000 0.000E+00 0.0000 1.014E-04 0.2014 0.000E+00 0.0000 0.000E+00 0.0000 9.187E-06 0.0183
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RESRAD, Version 6.5      T<sub>1/2</sub> Limit = 180 days      11/05/2013 15:07 Page 24

Intrisk : DT-9 Levee ISOU Resident

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Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p  
and Fraction of Total Risk at t = 3.000E+01 years

## Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Radio-Nuclide	risk	fract.	risk	fract.										
Ac-227	0.000E+00	0.0000	2.940E-07	0.0006										
Pa-231	0.000E+00	0.0000	1.562E-06	0.0031										
Pb-210	0.000E+00	0.0000	1.298E-05	0.0258										
Ra-226	0.000E+00	0.0000	2.371E-04	0.4710										
Ra-228	0.000E+00	0.0000	1.936E-06	0.0038										
Th-230	0.000E+00	0.0000	5.135E-06	0.0102										
Th-232	0.000E+00	0.0000	2.396E-04	0.4760										
U-234	0.000E+00	0.0000	5.046E-07	0.0010										
U-235	0.000E+00	0.0000	8.702E-07	0.0017										
U-238	0.000E+00	0.0000	3.407E-06	0.0068										
Total	0.000E+00	0.0000	5.033E-04	1.0000										

\*\*\*CNRSI(i,p,t) includes contribution from decay daughter radionuclides  
RESRAD, Version 6.5      T<sub>1/2</sub> Limit = 180 days      11/05/2013 15:07 Page 25  
In-risk : DT-9 Levee ISOU Resident  
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t = 1.000E+02 years

U-234	3.156E-03	8.767E+01	0.000E+00	0.000E+00	4.765E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.353E+02
U-235	1.985E-04	5.514E+00	0.000E+00	0.000E+00	2.997E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.510E-00
U-238	3.156E-03	8.767E+01	0.000E+00	0.000E+00	4.765E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.353E-02

\* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil  
and water-dependent water, fish, plant, meat, milk pathways

0  
Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of  
Radon and its Decay Products as pCi/yr at t= 1.000E+02 years  
0 Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependent  
RESRAD, Version 6.5      T½ Limit = 180 days      11/05/2013 15:07 Page 26  
Intrinsic : DT-9 Levee ISOU Resident  
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 1.000E+02 years												
Water Independent Pathways (Inhalation excludes radon)												
Radio-Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.445E-06	0.0029	8.284E-10	0.0000	7.225E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	6.961E-08	0.0001
Pa-231	1.422E-07	0.0003	1.879E-10	0.0000	1.036E-07	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.331E-08	0.0000
Pb-210	9.385E-08	0.0002	1.243E-09	0.0000	3.433E-05	0.0697	0.000E+00	0.0000	0.000E+00	0.0000	3.595E-06	0.0073
Ra-226	1.846E-04	0.3749	1.022E-09	0.0000	2.021E-05	0.0410	0.000E+00	0.0000	0.000E+00	0.0000	9.742E-07	0.0020
Ra-228	7.250E-05	0.1472	3.397E-10	0.0000	4.119E-05	0.0836	0.000E+00	0.0000	0.000E+00	0.0000	2.242E-06	0.0046
Th-228	1.242E-04	0.2523	9.267E-09	0.0000	4.536E-07	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	7.932E-07	0.0016
Th-230	1.990E-08	0.0000	2.771E-09	0.0000	1.286E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	2.965E-07	0.0006
Th-232	5.591E-09	0.0000	2.825E-09	0.0000	9.644E-08	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.275E-07	0.0005
U-234	5.914E-09	0.0000	1.068E-09	0.0000	2.485E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	2.235E-07	0.0005
U-235	7.957E-07	0.0016	5.952E-11	0.0000	1.598E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.453E-08	0.0000
U-238	2.629E-06	0.0053	8.760E-10	0.0000	3.138E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	2.970E-07	0.0006
Total	3.865E-04	0.7849	2.049E-08	0.0000	9.715E-05	0.1973	0.000E+00	0.0000	0.000E+00	0.0000	8.756E-06	0.0178

0  
Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+02 years

#### Water Dependent Pathways

Water	Fish	Plant	Meat	Milk	All Pathways**
-------	------	-------	------	------	----------------

Radio-Nuclide	risk	fract.										
Ac-227	0.000E+00	0.0000	1.588E-06	0.0032								
Pa-231	0.000E+00	0.0000	2.694E-07	0.0005								
Pb-210	0.000E+00	0.0000	3.802E-05	0.0772								
Ra-226	0.000E+00	0.0000	2.058E-04	0.4179								
Ra-228	0.000E+00	0.0000	1.159E-04	0.2354								
Th-228	0.000E+00	0.0000	1.255E-04	0.2548								
Th-230	0.000E+00	0.0000	4.477E-07	0.0009								
Th-232	0.000E+00	0.0000	3.324E-07	0.0007								
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+C0	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.789E-07	0.0010
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+C0	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	8.263E-07	0.0017
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	3.241E-06	0.0066
Total	0.000E+00	0.0000	4.924E-04	1.0000								

\*\* Sum of water independent ground, inhalation, plant, meat, milk, soil  
and water dependent water, fish, plant, meat, milk pathways

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
Radon and its Decay Products at t= 1.000E+02 years

Radionuclides								
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependent

0 Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)													
Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	
Ac-227	2.546E-08	0.0001	1.459E-11	0.0000	0.000E+00	0.0000	1.268E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
Pa-231	1.558E-06	0.0032	9.988E-10	0.0000	0.000E+00	0.0000	1.741E-07	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	
Pb-210	3.557E-09	0.0000	4.710E-11	0.0000	0.000E+00	0.0000	1.297E-06	0.0026	0.000E+00	0.0000	0.000E+00	0.0000	
Ra-226	1.751E-04	0.3556	2.118E-09	0.0000	0.000E+00	0.0000	5.090E-05	0.1034	0.000E+00	0.0000	0.000E+00	0.0000	
Ra-228	3.440E-10	0.0000	1.893E-14	0.0000	0.000E+00	0.0000	5.572E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
Th-230	9.605E-06	0.0195	2.867E-09	0.0000	0.000E+00	0.0000	2.463E-06	0.0050	0.000E+00	0.0000	0.000E+00	0.0000	
Th-232	1.967E-04	0.3995	1.243E-08	0.0000	0.000E+00	0.0000	4.174E-05	0.0848	0.000E+00	0.0000	0.000E+00	0.0000	

U-234	1.110E-08	0.0000	1.071E-09	0.0000	0.000E+00	0.0000	2.497E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	2.238E-07	0.0005
U-235	8.000E-07	0.0016	6.231E-11	0.0000	0.000E+00	0.0000	1.652E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.479E-08	0.0000
U-238	2.629E-06	0.0053	8.763E-10	0.0000	0.000E+00	0.0000	3.139E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	2.971E-07	0.0006

Total	3.865E-04	0.7849	2.049E-08	0.0000	0.000E+00	0.0000	9.715E-05	0.1973	0.000E+00	0.0000	0.000E+00	0.0000	8.756E-06	0.0178
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RESRAD, Version 6.5       $T_{1/2}$  Limit = 180 days      11/05/2013 15:07 Page 28

Intrinsic : DT-9 Levee ISOU Resident

File : C:\RESRAD\_FAMILY\RESRAD\6.5\USERFILES\DT9 LEVEE ISOU RES.RAD

Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+02 years

#### Water Dependent Pathways

Radio-Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.										
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	C.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.797E-08	0.0001
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	C.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.824E-06	0.0037
Pb-210	0.000E+00	0.0000	1.437E-06	0.0029										
Ra-226	0.000E+00	0.0000	2.303E-04	0.4676										
Ra-228	0.000E+00	0.0000	4.043E-10	0.0000										
Th-230	0.000E+00	0.0000	1.255E-05	0.0255										
Th-232	0.000E+00	0.0000	2.417E-04	0.4909										
U-234	0.000E+00	0.0000	4.856E-07	0.0010										
U-235	0.000E+00	0.0000	8.313E-07	0.0017										
U-238	0.000E+00	0.0000	3.241E-06	0.0066										
Total	0.000E+00	0.0000	4.924E-04	1.0000										

\*\*\*CNRSI(i,p,t) includes contribution from decay daughter radionuclides  
RESRAD, Version 6.5       $T_{1/2}$  Limit = 180 days      11/05/2013 15:07 Page 29

Intrinsic : DT-9 Levee ISOU Resident

File : C:\RESRAD\_FAMILY\RESRAD\6.5\USERFILES\DT9 LEVEE ISOU FES.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t= 3.000E+02 years

Radio-Nuclide	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total Ingestion*	
	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk		
Ac-227	1.169E-04	3.257E+00	0.000E+00	0.000E+00	1.764E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.021E+00	
Pa-231	1.208E-04	1.341E+01	0.000E+00	0.000E+00	1.823E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.524E+01	
Pb-210	2.718E-03	3.029E+02	0.000E+00	0.000E+00	4.104E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.439E+02	
Ra-226	2.712E-03	1.205E+03	0.000E+00	0.000E+00	4.094E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.246E+03	
Ra-228	2.165E-03	9.580E+02	0.000E+00	0.000E+00	3.269E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.907E+02	
Th-228	2.165E-03	3.579E+01	0.000E+00	0.000E+00	3.269E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.848E+01	
Th-230	3.240E-03	3.601E+01	0.000E+00	0.000E+00	4.891E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.492E+01	

Th-232	2.174E-03	2.417E+01	0.000E+00	0.000E+00	3.283E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.699E+01
U-234	2.736E-03	7.599E+01	0.000E+00	0.000E+00	4.130E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.173E+02
J-235	1.721E-04	4.779E+00	0.000E+00	0.000E+00	2.598E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.377E+00
U-238	2.736E-03	7.599E+01	0.000E+00	0.000E+00	4.130E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.173E+02

\* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil  
and water-dependent water, fish, plant, meat, milk pathways

0  
Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of  
Radon and its Decay Products as pCi/yr at t= 3.000E+02 years

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent      Water-dep. == Water-dependent  
RESRAD, Version 6.5      T½ Limit = 180 days      11/05/2013 15:07 Page 30  
Inrisk : DT-9 Levee ISOU Resident  
File : C:\RESRAD\_FAMILY\RESRAD\6.5\USERFILES\DT9 LEVEE ISOU RES.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 3.000E+02 years												
Water Independent Pathways (Inhalation excludes radon)												
Radio-Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.263E-06	0.0027	7.238E-10	0.0000	6.313E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	6.082E-08	0.0001
Pa-231	1.235E-07	0.0003	1.631E-10	0.0000	9.000E-08	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.024E-08	0.0000
Pb-210	8.498E-08	0.0002	1.125E-09	0.0000	3.108E-05	0.0661	0.000E+00	0.0000	0.000E+00	0.0000	3.255E-06	0.0069
Ra-226	1.689E-04	0.3590	9.348E-10	0.0000	1.848E-05	0.0393	0.000E+00	0.0000	0.000E+00	0.0000	8.911E-07	0.0019
Ra-228	7.249E-05	0.1541	3.397E-10	0.0000	4.118E-05	0.0875	0.000E+00	0.0000	0.000E+00	0.0000	2.241E-06	0.0048
Th-228	1.242E-04	0.2641	9.266E-09	0.0000	4.536E-07	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	7.931E-07	0.0017
Th-230	1.990E-08	0.0000	2.770E-09	0.0000	1.286E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	2.964E-07	0.0006
Th-232	5.591E-09	0.0000	2.825E-09	0.0000	9.643E-08	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.275E-07	0.0005
U-234	5.126E-09	0.0000	9.257E-10	0.0000	2.154E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	1.937E-07	0.0004
U-235	6.897E-07	0.0015	5.159E-11	0.0000	1.385E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.260E-08	0.0000
U-238	2.279E-06	0.0048	7.593E-10	0.0000	2.720E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	2.575E-07	0.0005
Total	3.701E-04	0.7867	1.988E-08	0.0000	9.208E-05	0.1957	0.000E+00	0.0000	0.000E+00	0.0000	8.250E-06	0.0175

0  
Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

Radio-Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Ac-227	0.000E+00	0.0000	1.387E-06	0.0029								
Pa-231	0.000E+00	0.0000	2.339E-07	0.0005								
Pb-210	0.000E+00	0.0000	3.443E-05	0.0732								
Ra-226	0.000E+00	0.0000	1.883E-04	0.4002								
Ra-228	0.000E+00	0.0000	1.159E-04	0.2464								
Th-228	0.000E+00	0.0000	1.255E-04	0.2667								
Th-230	0.000E+00	0.0000	4.476E-07	0.0010								
Th-232	0.000E+00	0.0000	3.323E-07	0.0007								
U-234	0.000E+00	0.0000	4.151E-07	0.0009								
U-235	0.000E+00	0.0000	7.162E-07	0.0015								
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.300E+00	0.000C	0.000E+00	0.0000	2.809E-06	0.0060
Total	0.000E+00	0.0000	4.704E-04	1.0000								

\*\* Sum of water independent ground, inhalation, plant, meat, milk, soil  
and water dependent water, fish, plant, meat, milk pathways

RESRAD, Version 6.5       $T_{1/2}$  Limit = 180 days      11/05/2013 15:07 Page 31  
Intrinsic : DT-9 Levee ISOU Resident  
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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
Radon and its Decay Products at t= 3.000E+02 years  
Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent    Water-dep. == Water-dependent

0  
Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+02 years  
Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	3.067E-11	0.0000	1.758E-14	0.0000	0.000E+00	0.0000	1.528E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.477E-12	0.0000
Pa-231	1.374E-06	0.0029	8.792E-10	0.0000	0.000E+00	0.0000	1.517E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	8.035E-08	0.0002
Pb-210	6.610E-12	0.0000	8.751E-14	0.0000	0.000E+00	0.0000	2.410E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.532E-10	0.0000
Ra-226	1.450E-04	0.3082	1.784E-09	0.0000	0.000E+00	0.0000	4.298E-05	0.0914	0.000E+00	0.0000	0.000E+00	0.0000	3.605E-06	0.0077
Ra-228	1.051E-20	0.0000	5.783E-25	0.0000	0.000E+00	0.0000	1.702E-21	0.0030	0.000E+00	0.0000	0.000E+00	0.0000	1.392E-22	0.0000
Th-230	2.397E-05	0.0509	3.038E-09	0.0000	0.000E+0C	0.0000	5.707E-06	0.0143	0.000E+00	0.0000	0.000E+00	0.0000	8.364E-07	0.0018

Th-232	1.967E-04	0.4182	1.243E-08	0.0000	0.000E+00	0.0000	4.173E-05	0.08E7	0.000E+00	0.0000	0.000E+00	0.0000	3.262E-06	0.0069
U-234	3.977E-08	0.0001	9.326E-10	0.0000	0.000E+00	0.0000	2.245E-07	0.00E5	0.000E+00	0.0000	0.000E+00	0.0000	1.950E-07	0.0004
U-235	7.017E-07	0.0015	5.932E-11	0.0000	0.000E+00	0.0000	1.524E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.331E-08	0.0000
U-238	2.279E-06	0.0048	7.601E-10	0.0000	0.000E+00	0.0000	2.722E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	2.576E-07	0.0005
<b>Total</b>	<b>3.701E-04</b>	<b>0.7867</b>	<b>1.988E-08</b>	<b>0.0000</b>	<b>0.000E+00</b>	<b>0.0000</b>	<b>9.208E-05</b>	<b>0.1957</b>	<b>0.000E+00</b>	<b>0.0000</b>	<b>0.000E+00</b>	<b>0.0000</b>	<b>8.250E-06</b>	<b>0.0175</b>

RESRAD, Version 6.5 T<sub>1/2</sub> Limit = 180 days 11/05/2013 15:07 Page 32

Intrisk : DT-9 Levee ISOU Resident

File : C:\RESRAD FAMILY\RESRAD\6.5\USERFILES\DT9 LEVEE ISSOU RES.RAD

FILE : C:\RBI

Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t = 3.000E+02 years

## Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Radio-Nuclide	risk	fract.	risk	fract.										
Ac-227	0.000E+00	0.0000	3.370E-11	0.0000										
Pa-231	0.000E+00	0.0000	1.607E-06	0.0034										
Pb-210	0.000E+00	0.0000	2.670E-09	0.0000										
Ra-226	0.000E+00	0.0000	1.916E-04	0.4072										
Ra-228	0.000E+00	0.0000	1.235E-20	0.0000										
Th-230	0.000E+00	0.0000	3.151E-05	0.0670										
Th-232	0.000E+00	0.0000	2.417E-04	0.5138										
U-234	0.000E+00	0.0000	4.603E-07	0.0010										
U-235	0.000E+00	0.0000	7.303E-07	0.0016										
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+03	3.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.810E-06	0.0060
Total	0.000E+00	0.0000	4.704E-04	1.0000										

\*\*\*CNRSI(i,p,t) includes contribution from decay daughter radionuclides

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Infrisk : DT-9 Levee TSOU Resident

File : C:\BESBAD FAMILY\BESBADY\6 5\USERBILLE\DT9 LEVEE ISOU BES-BADY

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As mCi/yr at t = 1.000E+03 years

Th-230	3.232E-03	3.592E+01	0.000E+00	0.000E+00	4.879E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.471E+01
Th-232	2.174E-03	2.416E+01	0.000E+00	0.000E+00	3.281E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.697E+01
U-234	1.659E-03	4.608E+01	0.000E+00	0.000E+00	2.504E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.112E+01
U-235	1.043E-04	2.898E+00	0.000E+00	0.000E+00	1.575E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.473E+00
U-238	1.659E-03	4.608E+01	0.000E+00	0.000E+00	2.504E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.112E+01

\* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil  
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of  
Radon and its Decay Products as pCi/yr at t= 1.000E+03 years

0

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependent  
RESRAD, Version 6.5      T<sub>1/2</sub> Limit = 180 days      11/05/2013 15:07 Page 34  
Intrinsic : DT-9 Levee ISOU Resident  
File : C:\RESRAD\_FAMILY\RESRAD\6.5\USERFILES\DT9 LEVEE ISOU FES.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 1.000E+03 years												
Water Independent Pathways (Inhalation excludes radon)												
Radio-Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	7.705E-07	0.0018	4.416E-10	0.0000	3.852E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	3.711E-08	0.0001
Pa-231	7.537E-08	0.0002	9.953E-11	0.0000	5.491E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.235E-08	0.0000
Pb-210	6.621E-08	0.0002	8.766E-10	0.0000	2.422E-05	0.0577	0.000E+00	0.0000	0.000E+00	0.0000	2.536E-06	0.0060
Ra-226	1.322E-04	0.3150	7.317E-10	0.0000	1.447E-05	0.0345	0.000E+00	0.0000	0.000E+00	0.0000	6.975E-07	0.0017
Ra-228	7.246E-05	0.1727	3.395E-10	0.0000	4.116E-05	0.0981	0.000E+00	0.0000	0.000E+00	0.0000	2.240E-06	0.0053
Th-228	1.242E-04	0.2959	9.262E-09	0.0000	4.534E-07	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	7.928E-07	0.0019
Th-230	1.984E-08	0.0000	2.763E-09	0.0000	1.282E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	2.956E-07	0.0007
Th-232	5.588E-09	0.0000	2.823E-09	0.0000	9.639E-08	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.274E-07	0.0005
U-234	3.108E-09	0.0000	5.613E-10	0.0000	1.306E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	1.174E-07	0.0003
U-235	4.182E-07	0.0010	3.128E-11	0.0000	8.398E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.637E-09	0.0000
U-238	1.382E-06	0.0033	4.604E-10	0.0000	1.649E-07	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	1.561E-07	0.0004
Total	3.315E-04	0.7901	1.839E-08	0.0000	8.092E-05	0.1929	0.000E+00	0.0000	0.000E+00	0.0000	7.120E-06	0.0170

0

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

Radio-Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Ac-227	0.000E+00	0.0000	8.466E-07	0.0020								
Pa-231	0.000E+00	0.0000	1.427E-07	0.0003								
Pb-210	0.000E+00	0.0000	2.682E-05	0.0639								
Ra-226	0.000E+00	0.0000	1.473E-04	0.3511								
Ra-228	0.000E+00	0.0000	1.159E-04	0.2761								
Th-228	0.000E+00	0.0000	1.254E-04	0.2989								
Th-230	0.000E+00	0.0000	4.465E-07	0.0011								
Th-232	0.000E+00	0.0000	3.322E-07	0.0008								
U-234	0.000E+00	0.0000	2.517E-07	0.0006								
U-235	0.000E+00	0.0000	4.343E-07	0.0010								
U-238	0.000E+00	0.0000	1.703E-06	0.0041								
Total	0.000E+00	0.0000	4.196E-04	1.0000								

\*\* Sum of water independent ground, inhalation, plant, meat, milk, soil and water dependent water, fish, plant, meat, milk pathways

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Inrisk : DT-9 Levee ISOU Resident

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of Radon and its Decay Products at t = 1.000E+03 years

Water-ind. == Water-independent      Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t = 1.00E+03 years

Th-230	5.717E-05	0.1363	3.429E-09	0.0000	0.000E+00	0.0000	1.655E-05	0.0394	0.000E+00	0.0000	0.000E+00	0.0000	1.660E-06	0.0040
Th-232	1.966E-04	0.4686	1.242E-08	0.0000	0.000E+00	0.0000	4.171E-05	0.0994	0.000E+00	0.0000	0.000E+00	0.0000	3.261E-06	0.0078
U-234	2.510E-07	0.0006	5.813E-10	0.0000	0.000E+00	0.0000	2.011E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	1.249E-07	0.0003
U-235	4.430E-07	0.0011	4.717E-11	0.0000	0.000E+00	0.0000	1.117E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.092E-09	0.0000
U-238	1.382E-06	0.0033	4.621E-10	0.0000	0.000E+00	0.0000	1.654E-07	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	1.565E-07	0.0004
Total	3.315E-04	0.7901	1.839E-08	0.0000	0.000E+00	0.0000	8.092E-05	0.1929	0.000E+00	0.0000	0.000E+00	0.0000	7.120E-06	0.0170

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Intrinsic : DT-9 Levee ISOU Resident

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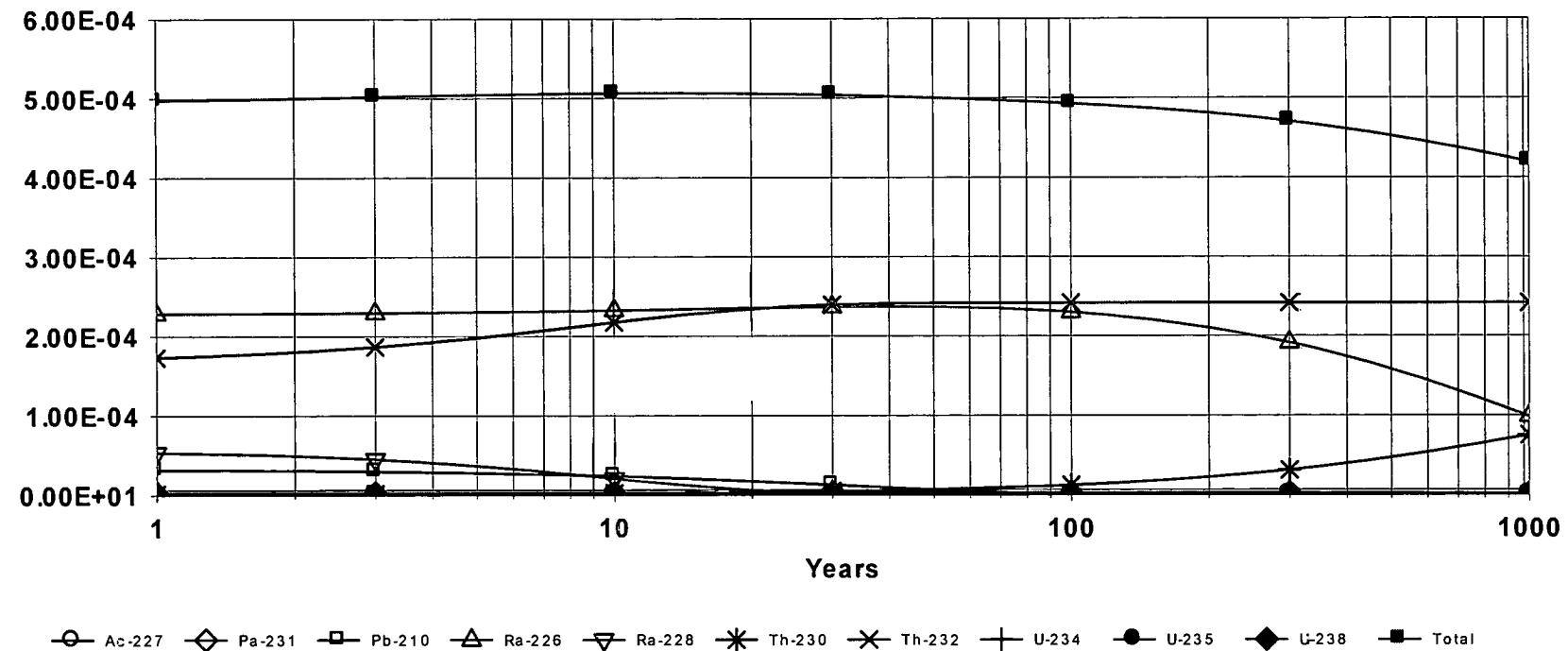
Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t = 1.000E+03 years

#### Water Dependent Pathways

Radio-Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.										
Ac-227	0.000E+00	0.0000	2.046E-21	0.0000										
Pa-231	0.000E+00	0.0000	9.603E-07	0.0023										
Pb-210	0.000E+00	0.0000	7.381E-19	0.0000										
Ra-226	0.000E+00	0.0000	9.890E-05	0.2357										
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000										
Th-230	0.000E+00	0.0000	7.539E-05	0.1797										
Th-232	0.000E+00	0.0000	2.416E-04	0.5758										
U-234	0.000E+00	0.0000	5.775E-07	0.0014										
U-235	0.000E+00	0.0000	4.633E-07	0.0011										
U-238	0.000E+00	0.0000	1.704E-06	0.0041										
Total	0.000E+00	0.0000	4.196E-04	1.0000										

\*\*\*CNRSI(i,p,t) includes contribution from decay daughter radionuclides

### EXCESS CANCER RISK: All Nuclides Summed, All Pathways Summed



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Cancer Risk Slope Factors Summary Table  
Risk Library: HEAST 2001 Morbidity

0 Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Ac-227+D	1.47E-06	3.48E-10	SLPF( 1,1)
Sf-1	Pa-231	1.39E-07	1.39E-07	SLPF( 2,1)
Sf-1	Pb-210+D	4.21E-09	1.41E-09	SLPF( 3,1)
Sf-1	Ra-226+D	8.49E-06	2.29E-08	SLPF( 4,1)
Sf-1	Ra-228+D	4.53E-06	0.00E+00	SLPF( 5,1)
Sf-1	Th-223+D	7.76E-06	5.59E-09	SLPF( 6,1)
Sf-1	Th-230	8.19E-10	8.19E-10	SLPF( 7,1)
Sf-1	Th-232	3.42E-10	3.42E-10	SLPF( 8,1)
Sf-1	U-234	2.52E-10	2.52E-10	SLPF( 9,1)
Sf-1	U-235+D	5.43E-07	5.18E-07	SLPF( 10,1)
Sf-1	U-238	4.99E-11	4.99E-11	SLPF( 11,1)
Sf-1	U-238+D	1.14E-07	4.99E-11	SLPF( 12,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Ac-227+D	2.09E-07	1.49E-07	SLPF( 1,2)
Sf-2	Pa-231	4.55E-08	4.55E-08	SLPF( 2,2)
Sf-2	Pb-210+D	1.39E-08	2.77E-09	SLPF( 3,2)
Sf-2	Ra-226+D	1.16E-08	1.15E-08	SLPF( 4,2)
Sf-2	Ra-228+D	5.23E-09	5.18E-09	SLPF( 5,2)
Sf-2	Th-226+D	1.43E-07	1.32E-07	SLPF( 6,2)

Sf-2	Th-230	2.85E-08	2.85E-08	SLPF( 7,2)
Sf-2	Th-232	4.33E-08	4.33E-08	SLPF( 8,2)
Sf-2	U-234	1.14E-08	1.14E-08	SLPF( 9,2)
Sf-2	U-235+D	1.01E-08	1.01E-08	SLPF( 10,2)
Sf-2	U-238	9.32E-09	9.32E-09	SLPF( 11,2)
Sf-2	U-238+D	9.35E-09	9.32E-09	SLPF( 12,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF( 1,3)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF( 2,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF( 3,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF( 4,3)
Sf-3	Ra-228+D	1.43E-09	1.43E-09	SLPF( 5,3)
Sf-3	Th-228+D	4.22E-10	1.48E-10	SLPF( 6,3)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF( 7,3)
Sf-3	Th-232	1.33E-10	1.33E-10	SLPF( 8,3)
Sf-3	U-234	9.55E-11	9.55E-11	SLPF( 9,3)
Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF( 10,3)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF( 11,3)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF( 12,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	4.86E-10	2.01E-10	SLPF( 1,4)
Sf-3	Pa-231	1.73E-10	1.73E-10	SLPF( 2,4)
Sf-3	Pb-210+D	1.27E-09	8.81E-10	SLPF( 3,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF( 4,4)
Sf-3	Ra-228+D	1.04E-09	1.04E-09	SLPF( 5,4)
Sf-3	Th-228+D	3.00E-10	1.07E-10	SLPF( 6,4)
Sf-3	Th-230	9.10E-11	9.10E-11	SLPF( 7,4)

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Intrisk : DT-9 Levee Accessible Soil Resident  
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Cancer Risk Slope Factors Summary Table (continued)  
 Risk Library: HEAST 2001 Morbidity

0 Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-3	Th-232	1.01E-10	1.01E-10	SLPF( 8,4)
Sf-3	U-234	7.07E-11	7.07E-11	SLPF( 9,4)
Sf-3	U-235+D	7.18E-11	6.96E-11	SLPF( 10,4)
Sf-3	U-238	6.40E-11	6.40E-11	SLPF( 11,4)
Sf-3	U-238+D	8.71E-11	6.40E-11	SLPF( 12,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	1.16E-09	3.81E-10	SLPF( 1,5)
Sf-3	Pa-231	3.74E-10	3.74E-10	SLPF( 2,5)
Sf-3	Pb-210+D	2.66E-09	1.84E-09	SLPF( 3,5)
Sf-3	Ra-226+D	7.30E-10	7.29E-10	SLPF( 4,5)
Sf-3	Ra-228+D	2.29E-09	2.28E-09	SLPF( 5,5)

Sf-3	Th-228+D	8.09E-10	2.89E-10	SLPF( 6,5)
Sf-3	Th-230	2.02E-10	2.02E-10	SLPF( 7,5)
Sf-3	Th-232	2.31E-10	2.31E-10	SLPF( 8,5)
Sf-3	U-234	1.58E-10	1.58E-10	SLPF( 9,5)
Sf-3	U-235+D	1.63E-10	1.57E-10	SLPF( 10,5)
Sf-3	U-238	1.43E-10	1.43E-10	SLPF( 11,5)
Sf-3	U-238+D	2.10E-10	1.43E-10	SLPF( 12,5)
Sf-Rn	Radon Inhalation slope factors, 1/(pCi):			
Sf-Rn	Rn-222	1.80E-12	1.80E-12	SLPFRN(1,1)
Sf-Rn	Po-218	3.70E-12	3.70E-12	SLPFRN(1,2)
Sf-Rn	Pb-214	6.20E-12	6.20E-12	SLPFRN(1,3)
Sf-Rn	Bi-214	1.50E-11	1.50E-11	SLPFRN(1,4)
Sf-Rn	Rn-220	1.90E-13	1.90E-13	SLPFRN(2,1)
Sf-Rn	Po-216	3.00E-15	3.00E-15	SLPFRN(2,2)
Sf-Rn	Pb-212	3.90E-11	3.90E-11	SLPFRN(2,3)
Sf-Rn	Bi-212	3.70E-11	3.70E-11	SLPFRN(2,4)
Sf-Rn	Radon K factors, (mrem/WLM):			
Sf-Rn	Rn-222 Indoor	7.60E+02	7.60E+02	KFACTR(1,1)
Sf-Rn	Rn-222 Outdoor	5.70E+02	5.70E+02	KFACTR(1,2)
Sf-Rn	Rn-220 Indoor	1.50E+02	1.50E+02	KFACTR(2,1)
Sf-Rn	Rn-220 Outdoor	2.50E+02	2.50E+02	KFACTR(2,2)

\*Base Case means Default.Lib w/o Associate Nuclide contributions.  
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Po-212	0.000E+00									
Po-214	3.860E-10	5.290E-01								
Po-215	7.480E-10	5.308E-01								
Po-216	7.870E-11	5.295E-01								
Po-218	4.260E-11	5.295E-01								
Ra-223	4.340E-07	5.335E-01								
Ra-224	3.720E-08	5.335E-01								
Ra-226	2.290E-08	5.341E-01								
Ra-228	0.000E+00									
Rn-219	2.250E-07	5.327E-01								
Rn-220	1.700E-09	5.304E-01								
Rn-222	1.740E-09	5.304E-01								
Th-227	3.780E-07	5.337E-01								
Th-228	5.590E-09	5.350E-01								
Th-230	8.190E-10	5.357E-01								
Th-231	2.450E-08	5.363E-01								
Th-232	3.420E-10	5.367E-01								
Th-234	1.630E-08	5.368E-01								
Tl-207	1.520E-08	5.303E-01								
Tl-208	1.760E-05	5.287E-01								
Tl-210	0.000E+00	5.384E-01								
U-234	2.520E-10	5.365E-01								
U-235	5.180E-07	5.339E-01								
U-238	4.990E-11	5.384E-01								

\* - Units are 1/yr per (pCi/g) at infinite depth and area. Multiplication by ETFG(i,t) converts to site conditions.

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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t= 0.000E+00 years

Radio-Nuclide	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total Ingestion*
	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	
Ac-227	1.851E-04	4.738E+00	0.000E+00	0.000E+00	2.575E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.313E+00
Pa-231	7.866E-04	8.052E+01	0.000E+00	0.000E+00	1.094E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.146E+01
Pb-210	8.491E-03	8.691E+02	0.000E+00	0.000E+00	1.181E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.873E+02
Ra-226	6.524E-03	2.671E+03	0.000E+00	0.000E+00	9.077E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.762E+03
Ra-228	1.990E-03	8.146E+02	0.000E+00	0.000E+00	2.768E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.423E+02
Th-228	2.614E-03	2.678E+01	0.000E+00	0.000E+00	3.637E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.315E+01
Th-230	5.206E-03	5.333E+01	0.000E+00	0.000E+00	7.242E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.258E+02
Th-232	2.175E-03	2.228E+01	0.000E+00	0.000E+00	3.026E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.254E+01
U-234	4.951E-03	1.267E+02	0.000E+00	0.000E+00	6.888E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.956E+02
U-235	3.933E-04	1.007E+01	0.000E+00	0.000E+00	5.472E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.554E+01
U-238	4.951E-03	1.267E+02	0.000E+00	0.000E+00	6.888E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.956E+02

\* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil

and water-dependent water, fish, plant, meat, milk pathways

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of  
Radon and its Decay Products as pCi/yr at t = 0.000E+00 years

Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependent  
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Inrisk : DT-9 Levee Accessible Soil Resident  
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	3.954E-06	0.0053	2.442E-09	0.0000	1.969E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	1.891E-07	0.0003
Pa-231	7.465E-07	0.0010	1.062E-09	0.0000	5.400E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	1.215E-07	0.0002
Pb-210	2.262E-07	0.0003	3.232E-09	0.0000	8.223E-05	0.1103	0.000E+00	0.0000	0.000E+00	0.0000	8.617E-06	0.0116
Ra-226	3.765E-04	0.5051	2.244E-09	0.0000	4.088E-05	0.0549	0.000E+00	0.0000	0.000E+00	0.0000	1.971E-06	0.0026
Ra-228	6.588E-05	0.0884	3.323E-10	0.0000	3.713E-05	0.0498	0.000E+00	0.0000	0.000E+00	0.0000	2.021E-06	0.0027
Th-228	1.151E-04	0.1544	9.245E-09	0.0000	4.138E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	7.293E-07	0.0010
Th-230	2.961E-08	0.0000	4.451E-09	0.0000	1.904E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	4.389E-07	0.0006
Th-232	5.176E-09	0.0000	2.825E-09	0.0000	8.889E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	2.097E-07	0.0003
U-234	8.587E-09	0.0000	1.675E-09	0.0000	3.592E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	3.230E-07	0.0004
U-235	1.462E-06	0.0020	1.179E-10	0.0000	2.918E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.653E-08	0.0000
U-238	3.830E-06	0.0051	1.374E-09	0.0000	4.537E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	4.294E-07	0.0006
Total	5.677E-04	0.7617	2.900E-08	0.0000	1.625E-04	0.2181	0.000E+00	0.0000	0.000E+00	0.0000	1.508E-05	0.0202

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

Radio-Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Ac-227	0.000E+00	0.0000	4.343E-06	0.0058								
Pa-231	0.000E+00	0.0000	1.409E-06	0.0019								

Pb-210	0.000E+00	0.0000	9.108E-05	0.1222								
Ra-226	0.000E+00	0.0000	4.193E-04	0.5626								
Ra-228	0.000E+00	0.0000	1.050E-04	0.1409								
Th-228	0.000E+00	0.0000	1.162E-04	0.1559								
Th-230	0.000E+00	0.0000	6.633E-07	0.0009								
Th-232	0.000E+00	0.0000	3.066E-07	0.0004								
U-234	0.000E+00	0.0000	6.925E-07	0.0009								
U-235	0.000E+00	0.0000	1.518E-06	0.0020								
U-238	0.000E+00	0.0000	4.714E-06	0.0063								
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	C.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.453E-04	1.0000

\*\* Sum of water independent ground, inhalation, plant, meat, milk, soil  
and water dependent water, fish, plant, meat, milk pathways

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Intrinsic : DT-9 Levee Accessible Soil Resident  
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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
Radon and its Decay Products at t= 0.000E+00 years

Radionuclides								
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 0.000E+00 years  
Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground	Inhalation	Radon	Plant	Meat	Milk	Soil	
	risk fract.							
Ac-227	1.182E-06	0.0016	7.299E-10	0.0000	0.000E+00	0.0001	0.000E+00	0.0000
Pa-231	3.519E-06	0.0047	2.774E-09	0.0000	0.000E+00	0.0000	6.784E-07	0.0009
Pb-210	1.603E-07	0.0002	2.290E-09	0.0000	0.000E+00	0.0000	5.812E-05	0.0780
Ra-226	3.746E-04	0.5026	3.170E-09	0.0000	0.000E+00	0.0000	6.470E-05	0.0868
Ra-228	4.461E-05	0.0599	2.335E-09	0.0000	0.000E+00	0.0000	9.488E-06	0.0127
Th-228	1.281E-05	0.0172	1.029E-09	0.0000	0.000E+00	0.0000	3.122E-08	0.0000
Th-230	1.981E-06	0.0027	4.465E-09	0.0000	0.000E+00	0.0000	4.914E-07	0.0007
Th-232	1.235E-04	0.1658	9.038E-09	0.0000	0.000E+00	0.0000	2.811E-05	0.0377
U-234	8.757E-09	0.0000	1.676E-09	0.0000	0.000E+00	0.0000	3.593E-07	0.0005
U-235	1.462E-06	0.0020	1.183E-10	0.0000	0.000E+00	0.0000	2.928E-08	0.0000
U-238	3.830E-06	0.0051	1.374E-09	0.0000	0.000E+00	0.0000	4.537E-07	0.0006

Total 5.677E-04 0.7617 2.900E-08 0.0000 0.000E+00 0.0000 1.625E-04 0.2181 0.000E+00 0.0000 0.000E+00 0.0000 1.508E-05 0.0202  
RESRAD, Version 6.5 T<sub>2</sub> Limit = 180 days 11/05/2013 15:11 Page 8  
Inrisk : DT-9 Levee Accessible Soil Resident  
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Total Excess Cancer Risk CNRS(i,p,-)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t = 0.000E+00 years

## Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Radio-Nuclide	risk	fract.	risk	fract.										
Ac-227	0.000E+00	0.0000	1.297E-06	0.0017										
Pa-231	0.000E+00	0.0000	4.454E-06	0.0060										
Pb-210	0.000E+00	0.0000	6.439E-05	0.0864										
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+C0	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.437E-04	0.5954
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+C0	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	0.000E+00	0.0000	5.478E-05	0.0735
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+C0	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	0.000E+00	0.0000	1.292E-05	0.0173
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+C0	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.935E-06	0.0039
Th-232	0.000E+00	0.0000	1.538E-04	0.2064										
U-234	0.000E+00	0.0000	6.928E-07	0.0009										
U-235	0.000E+00	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.518E-06	0.0020
U-238	0.000E+00	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.715E-06	0.0063
Total	0.000E+00	0.0000	7.453E-04	1.0000										

\*\*\*CNRSI(i,p,t) includes contribution from decay daughter radionuclides  
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Intrinsic : DT-9 Levee Accessible Soil Resident  
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t = 1.000E+00 years

U-238 4.948E-03 1.266E+02 0.000E+00 0.000E+00 6.883E+01 0.000E+00 0.000E+00 0.000E+00 0.000E+00 1.955E+02

\* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil and water-dependent water, fish, plant, meat, milk pathways

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of Radon and its Decay Products as pCi/yr at t= 1.000E+00 years  
Radionuclides

Water-ind. == Water-independent      Water-dep. == Water-dependent  
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Intrinsic : DT-9 Levee Accessible Soil Resident  
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Excess Cancer Risks CNRS(*i*,*p*,*t*) for Individual Radionuclides (*i*) and Pathways (*p*)  
and Fraction of Total Risk at *t*= 1.000E+00 years

Radio-Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	4.070E-06	0.0055	2.514E-09	0.0000	2.027E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	1.947E-07	0.0003
Pa-231	7.460E-07	0.0010	1.061E-09	0.0000	5.396E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	1.214E-07	0.0002
Pb-210	2.250E-07	0.0003	3.214E-09	0.0000	8.179E-05	0.1099	0.000E+00	0.0000	0.000E+00	0.0000	8.570E-06	0.0115
Ra-226	3.762E-04	0.5055	2.242E-09	0.0000	4.086E-05	0.0549	0.000E+00	0.0000	0.000E+00	0.0000	1.970E-06	0.0026
Ra-228	6.604E-05	0.0887	3.332E-10	0.0000	3.722E-05	0.0500	0.000E+00	0.0000	0.000E+00	0.0000	2.026E-06	0.0027
Th-228	1.144E-04	0.1538	9.194E-09	0.0000	4.132E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	7.253E-07	0.0010
Th-230	2.961E-08	0.0000	4.451E-09	0.0000	1.904E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	4.389E-07	0.0000
Th-232	5.176E-09	0.0000	2.825E-09	0.0000	8.889E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	2.097E-07	0.0003
U-234	8.581E-09	0.0000	1.674E-09	0.0000	3.590E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	3.228E-07	0.0004
U-235	1.461E-06	0.0020	1.178E-10	0.0000	2.916E-08	0.0000	0.000E+00	0.0003	0.000E+00	0.0000	2.651E-08	0.0000
U-238	3.827E-06	0.0051	1.373E-09	0.0000	4.534E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	4.291E-07	0.0000
Total	5.671E-04	0.7619	2.900E-08	0.0000	1.621E-04	0.2178	0.000E+00	0.0000	0.000E+00	0.0000	1.503E-05	0.0202

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+00 years

## Water Dependent Pathways

Ac-227	0.000E+00	0.0000	4.470E-06	0.0060								
Pa-231	0.000E+00	0.0000	1.408E-06	0.0019								
Fb-210	0.000E+00	0.0000	9.058E-05	0.1217								
Ra-226	0.000E+00	0.0000	4.191E-04	0.5630								
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+30	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.053E-04	0.1415
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+30	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.156E-04	0.1553
Th-230	0.000E+00	0.0000	6.633E-07	0.0009								
Th-232	0.000E+00	0.0000	3.066E-07	0.0004								
U-234	0.000E+00	0.0000	6.920E-07	0.0009								
U-235	0.000E+00	0.0000	1.517E-06	0.0020								
U-238	0.000E+00	0.0000	4.711E-06	0.0063								
Total	0.000E+00	0.0000	7.443E-04	1.0000								

\*\* Sum of water independent ground, inhalation, plant, meat, milk, soil  
and water dependent water, fish, plant, meat, milk pathways

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
Radon and its Decay Products at t= 1.000E+00 years

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent      Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.143E-06	0.0015	7.057E-10	0.0000	0.000E+00	0.0000	5.653E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	5.465E-08	0.0001
Pa-231	3.673E-06	0.0049	2.869E-09	0.0000	0.000E+00	0.0000	6.857E-07	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	2.614E-07	0.0004
Pb-210	1.553E-07	0.0002	2.219E-09	0.0000	0.000E+00	0.0000	5.632E-05	0.0757	0.000E+00	0.0000	0.000E+00	0.0000	5.917E-06	0.0080
Ra-226	3.742E-04	0.5028	3.221E-09	0.0000	0.000E+00	0.0000	6.600E-05	0.0887	0.000E+00	0.0000	0.000E+00	0.0000	4.601E-06	0.0062
Ra-228	4.230E-05	0.0568	2.292E-09	0.0000	0.000E+00	0.0000	8.414E-06	0.0113	0.000E+00	0.0000	0.000E+00	0.0000	6.257E-07	0.0008
Th-228	8.918E-06	0.0120	7.165E-10	0.0000	0.000E+00	0.0000	2.173E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.652E-08	0.0001
Th-230	2.110E-06	0.0028	4.466E-09	0.0000	0.000E+00	0.0000	5.140E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	4.599E-07	0.0006
Th-232	1.293E-04	0.1737	9.344E-09	0.0000	0.000E+00	0.0000	2.929E-05	0.0394	0.000E+00	0.0000	0.000E+00	0.0000	2.279E-06	0.0031
U-234	8.768E-09	0.0000	1.675E-09	0.0000	0.000E+00	0.0000	3.590E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	3.228E-07	0.0004

U-235	1.461E-06	0.0020	1.182E-10	0.0000	0.000E+00	0.0000	2.526E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.655E-08	0.00000
U-238	3.827E-06	0.0051	1.373E-09	0.0000	0.000E+00	0.0000	4.534E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	4.291E-07	0.0006

```
Total      5.671E-04  0.7619   2.900E-08  0.0000   0.000E+00  0.0000   1.621E-04  0.2178   0.000E+00  0.0000   0.000E+00  0.0000   1.503E-05  0.0202
```

RESRAD, Version 6.5       $T_{\frac{1}{2}}$  Limit = 180 days

Intrisk : DT-9 Levee Accessible Soil Resident  
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Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existant Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t = 1.000E+00 years

## Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Radio-Nuclide	risk	fract.	risk	fract.										
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.300E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.254E-06	0.0017
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.300E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.623E-06	0.0062
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.300E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.239E-05	0.0838
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000G	0.000E+00	0.0000	0.000E+00	0.0000	4.448E-04	0.5977
Ra-228	0.000E+00	0.0000	5.134E-05	0.0690										
Th-228	0.000E+00	0.0000	8.997E-06	0.0121										
Th-230	0.000E+00	0.0000	3.088E-06	0.0041										
Th-232	0.000E+00	0.0000	1.608E-04	0.2161										
U-234	0.000E+00	0.0000	6.923E-07	0.0009										
U-235	0.000E+00	0.0000	1.517E-06	0.0020										
U-238	0.000E+00	0.0000	4.711E-06	0.0063										
Total	0.000E+00	0.0000	7.443E-04	1.0000										

\*\*\*CNRSI(i,p,t) includes contribution from decay daughter radionuclides  
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t = 3.000E+00 years

Radio-Nuclide	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total Ingestion*
	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	
Ac-227	2.387E-04	6.178E+00	0.000E+00	0.000E+00	3.321E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.499E+00
Pa-231	7.849E-04	8.035E+01	0.000E+00	0.000E+00	1.092E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.127E+01
Pb-210	8.307E-03	8.524E+02	0.000E+00	0.000E+00	1.156E+02	0.000E+00	C.000E+00	0.000E+00	0.000E+00	0.000E+00	9.680E+02
Ra-226	6.513E-03	2.666E+03	0.000E+00	0.000E+00	9.061E+01	0.000E+00	C.000E+00	0.000E+00	0.000E+00	0.000E+00	2.757E+03
Ra-228	2.043E-03	8.329E+02	0.000E+00	0.000E+00	2.843E+01	0.000E+00	C.000E+00	0.000E+00	0.000E+00	0.000E+00	8.613E+02
Th-228	2.222E-03	3.296E+01	0.000E+00	0.000E+00	3.092E+01	0.000E+00	C.000E+00	0.000E+00	0.000E+00	0.000E+00	6.388E+01
Th-230	5.206E-03	5.333E+01	0.000E+00	0.000E+00	7.242E+01	0.000E+00	C.000E+00	0.000E+00	0.000E+00	0.000E+00	1.257E+02

Th-232	2.175E-03	2.228E+01	0.000E+00	0.000E+00	3.026E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.254E+01
U-234	4.941E-03	1.265E+02	0.000E+00	0.000E+00	6.874E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.952E+02
U-235	3.925E-04	1.005E+01	0.000E+00	0.000E+00	5.460E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.551E+01
U-238	4.941E-03	1.265E+02	0.000E+00	0.000E+00	6.874E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.952E+02

\* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil  
and water-dependent water, fish, plant, meat, milk pathways

0  
Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of  
Radon and its Decay Products as pCi/yr at t= 3.000E+00 years

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E-00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E-00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent      Water-dep. == Water-dependent  
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Intrinsic : DT-9 Levee Accessible Soil Resident  
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Radio-Nuclide	Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 3.000E+00 years											
	Water Independent Pathways (Inhalation excludes radon)											
	Ground		Inhalation		Plant		Meat		Milk		Soil	
risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk
Ac-227	4.291E-06	0.0058	2.650E-09	0.0000	2.136E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	2.052E-07	0.0003
Pa-231	7.449E-07	0.0010	1.060E-09	0.0000	5.389E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	1.212E-07	0.0002
Pb-210	2.226E-07	0.0003	3.180E-09	0.0000	8.093E-05	0.1089	0.000E+00	0.0000	0.000E+00	0.0000	8.480E-06	0.0114
Ra-226	3.758E-04	0.5058	2.240E-09	0.0000	4.081E-05	0.0549	0.000E+00	0.0000	0.000E+00	0.0000	1.967E-06	0.0026
Ra-228	6.632E-05	0.0893	3.346E-10	0.0000	3.738E-05	0.0503	0.000E+00	0.0000	0.000E+00	0.0000	2.035E-06	0.0027
Th-228	1.139E-04	0.1533	9.151E-09	0.0000	4.125E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	7.219E-07	0.0010
Th-230	2.961E-08	0.0000	4.451E-09	0.0000	1.904E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	4.389E-07	0.0006
Th-232	5.176E-09	0.0000	2.825E-09	0.0000	8.889E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	2.097E-07	0.0003
U-234	8.568E-09	0.0000	1.672E-09	0.0000	3.585E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	3.223E-07	0.0004
U-235	1.459E-06	0.0020	1.177E-10	0.0000	2.911E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.648E-08	0.0000
U-238	3.822E-06	0.0051	1.371E-09	0.0000	4.527E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	4.285E-07	0.0006
Total	5.666E-04	0.7626	2.905E-08	0.0000	1.614E-04	0.2172	0.000E+00	0.0000	0.000E+00	0.0000	1.496E-05	0.0201

0  
Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

Radio-Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Ac-227	0.000E+00	0.0000	4.712E-06	0.0063								
Pa-231	0.000E+00	0.0000	1.406E-06	0.0019								
Pb-210	0.000E+00	0.0000	8.963E-05	0.1206								
Ra-226	0.000E+00	0.0000	4.186E-04	0.5634								
Ra-228	0.000E+00	0.0000	1.057E-04	0.1423								
Th-228	0.000E+00	0.0000	1.150E-04	0.1548								
Th-230	0.000E+00	0.0000	6.633E-07	0.0009								
Th-232	0.000E+00	0.0000	3.066E-07	0.0004								
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	6.910E-07	0.0009
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	1.514E-06	0.0020
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	4.704E-06	0.0063
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	7.430E-04	1.0000

\*\* Sum of water independent ground, inhalation, plant, meat, milk, soil  
and water dependent water, fish, plant, meat, milk pathways

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Intrinsic : DT-9 Levee Accessible Soil Resident  
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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
Radon and its Decay Products at t= 3.000E+00 years

Radionuclides								
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E-00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E-00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E-00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent    Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+00 years  
Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.068E-06	0.0014	6.599E-10	0.0000	0.000E+00	0.0000	5.286E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	5.110E-08	0.0001
Pa-231	3.967E-06	0.0053	3.050E-09	0.0000	0.000E+00	0.0000	6.995E-07	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	2.753E-07	0.0004
Pb-210	1.459E-07	0.0002	2.084E-09	0.0000	0.000E+00	0.0000	5.289E-05	0.0712	0.000E+00	0.0000	0.000E+00	0.0000	5.557E-06	0.0075
Ra-226	3.735E-04	0.5027	3.317E-09	0.0000	0.000E+00	0.0000	6.848E-05	0.0922	0.000E+00	0.0000	0.000E+00	0.0000	4.866E-06	0.0065
Ra-228	3.627E-05	0.0488	2.045E-09	0.0000	0.000E+00	0.0000	6.612E-06	0.0089	0.000E+00	0.0000	0.000E+00	0.0000	5.106E-07	0.0007
Th-228	4.321E-06	0.0058	3.471E-10	0.0000	0.000E+00	0.0000	1.053E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.738E-08	0.0000

Th-230	2.368E-06	0.0032	4.469E-09	0.0000	0.000E+00	0.0000	5.605E-07	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	4.632E-07	0.0006
Th-232	1.396E-04	0.1880	9.918E-09	0.0000	0.000E+00	0.0000	3.126E-05	0.0421	0.000E+00	0.0000	0.000E+00	0.0000	2.428E-06	0.0033
U-234	8.794E-09	0.0000	1.672E-09	0.0000	0.000E+00	0.0000	3.585E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	3.224E-07	0.0004
U-235	1.459E-06	0.0020	1.181E-10	0.0000	0.000E+00	0.0000	2.924E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.652E-08	0.0000
U-238	3.822E-06	0.0051	1.371E-09	0.0000	0.000E+00	0.0000	4.527E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	4.285E-07	0.0006
<b>Total</b>	<b>5.666E-04</b>	<b>0.7626</b>	<b>2.905E-08</b>	<b>0.0000</b>	<b>0.000E+00</b>	<b>0.0000</b>	<b>1.614E-04</b>	<b>0.2172</b>	<b>0.000E+00</b>	<b>0.0000</b>	<b>0.000E+00</b>	<b>0.0000</b>	<b>1.496E-05</b>	<b>0.0201</b>

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Intrinsic : DT-9 Levee Accessible Soil Resident

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File : C:\RESRAD\_FAMILY\RESRAD\V6.0\USERFILES\B19\_ELEV0\_ACCESS.RES.RAD

Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t = 3.000E+00 years

## Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Radio-Nuclide	risk	fract.	risk	fract.										
Ac-227	0.0000E+00	0.0000	1.1730E-06	0.0016										
Pa-231	0.0000E+00	0.0000	4.9440E-06	0.0067										
Pb-210	0.0000E+00	0.0000	5.8590E-05	0.0789										
Ra-226	0.0000E+00	0.0000	4.4690E-04	0.6015										
Ra-228	0.0000E+00	0.0000	4.3390E-05	0.0584										
Th-228	0.0000E+00	0.0000	4.3590E-06	0.0059										
Th-230	0.0000E+00	0.0000	3.3960E-06	0.0046										
Tl-232	0.0000E+00	0.0000	1.7330E-04	0.2333										
U-234	0.0000E+00	0.0000	6.9140E-07	0.0009										
U-235	0.0000E+00	0.0000	1.5150E-06	0.0020										
U-238	0.0000E+00	0.0000	4.7040E-06	0.0063										
Total	0.0000E+00	0.0000	7.4300E-04	1.0000										

\*\*\*CNRSI(i,p,t) includes contribution from decay daughter radionuclides  
RESRAD, Version 6.5 T<sub>1/2</sub> Limit = 180 days 11/05/2013 15:11 Page 17  
Intrinsic : DT-9 Levee Accessible Soil Resident  
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t = 1.000E+01 years

Ra-228	2.113E-03	8.615E+02	0.000E+00	0.000E+00	2.940E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.909E+02
Th-228	2.106E-03	3.212E+01	0.000E+00	0.000E+00	2.930E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.142E+01
Th-230	5.206E-03	5.333E+01	0.000E+00	0.000E+00	7.242E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.257E+02
Th-232	2.175E-03	2.228E+01	0.000E+00	0.000E+00	3.026E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.254E+01
U-234	4.916E-03	1.258E+02	0.000E+00	0.000E+00	6.839E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.942E+02
U-235	3.905E-04	9.996E+00	0.000E+00	0.000E+00	5.433E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.543E+01
U-238	4.916E-03	1.258E+02	0.000E+00	0.000E+00	6.839E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.942E+02

\* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil  
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of  
Radon and its Decay Products as pCi/yr at t= 1.000E+01 years

0

Radionuclides								
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependent  
RESRAD, Version 6.5      T½ Limit = 180 days      11/05/2013 15:11 Page 18  
Intrisk : DT-9 Levee Accessible Soil Resident  
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 1.000E+01 years												
Water Independent Pathways (Inhalation excludes radon)												
Radio-Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	4.949E-06	0.0067	3.057E-09	0.0000	2.462E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	2.368E-07	0.0003
Pa-231	7.411E-07	0.0010	1.054E-09	0.0000	5.361E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	1.206E-07	0.0002
Pb-210	2.153E-07	0.0003	3.076E-09	0.0000	7.828E-05	0.1057	0.000E+00	0.C000	0.000E+00	0.0000	8.202E-06	0.0111
Ra-226	3.742E-04	0.5055	2.230E-09	0.0000	4.064E-05	0.0549	0.000E+00	0.0000	0.000E+00	0.0000	1.959E-06	0.0026
Ra-228	6.691E-05	0.0904	3.375E-10	0.0000	3.771E-05	0.0509	0.000E+00	0.0000	0.000E+00	0.0000	2.052E-06	0.0028
Th-228	1.143E-04	0.1544	9.184E-09	0.0000	4.147E-07	0.0006	0.000E+00	0.C000	0.000E+00	0.0000	7.245E-07	0.0010
Th-230	2.961E-08	0.0000	4.451E-09	0.0000	1.904E-07	0.0003	0.000E+00	0.C000	0.000E+00	0.0000	4.389E-07	0.0006
Th-232	5.176E-09	0.0000	2.825E-09	0.0000	8.889E-08	0.0001	0.000E+00	0.C000	0.000E+00	0.0000	2.097E-07	0.0003
U-234	8.526E-09	0.0000	1.663E-09	0.0000	3.567E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	3.207E-07	0.0004
U-235	1.451E-06	0.0020	1.171E-10	0.0000	2.897E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.634E-08	0.0000
U-238	3.803E-06	0.0051	1.364E-09	0.0000	4.505E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	4.263E-07	0.0006
Total	5.667E-04	0.7654	2.936E-08	0.0000	1.589E-04	0.2147	0.000E+00	0.0000	0.000E+00	0.0000	1.472E-05	0.0199

0

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+01 years

### Water Dependent Pathways

Radio-Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Ac-227	0.000E+00	0.0000	5.435E-06	0.0073								
Pa-231	0.000E+00	0.0000	1.399E-06	0.0019								
Pb-210	0.000E+00	0.0000	8.670E-05	0.1171								
Ra-226	0.000E+00	0.0000	4.168E-04	0.5630								
Ra-228	0.000E+00	0.0000	1.067E-04	0.1441								
Th-228	0.000E+00	0.0000	1.155E-04	0.1560								
Th-230	0.000E+00	0.0000	6.633E-07	0.0009								
Th-232	0.000E+00	0.0000	3.066E-07	0.0004								
U-234	0.000E+00	0.0000	6.876E-07	0.0009								
U-235	0.000E+00	0.0000	1.507E-06	0.0020								
U-238	0.000E+00	0.0000	4.681E-06	0.0063								
Total	0.000E+00	0.0000	7.403E-04	1.0000								

\*\* Sum of water independent ground, inhalation, plant, meat, milk, soil  
and water dependent water, fish, plant, meat, milk pathways

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Intrinsic : DT-9 Levee Accessible Soil Resident  
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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
Radon and its Decay Products at t= 1.000E+01 years

Radionuclides								
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependent

0  
Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)														
Ground		Inhalation		Radon		Plant		Meat		Milk		Soil		
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	8.443E-07	0.0011	5.215E-10	0.0000	0.000E+00	0.0000	4.178E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	4.039E-08	0.0001
Pa-231	4.845E-06	0.0065	3.589E-09	0.0000	0.000E+00	0.0000	7.404E-07	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	3.169E-07	0.0004
Pb-210	1.170E-07	0.0002	1.672E-09	0.0000	0.000E+0C	0.0000	4.244E-05	0.0573	0.000E+00	0.0000	0.000E+00	0.0000	4.459E-06	0.0060

Ra-226	3.711E-04	0.5012	3.607E-09	0.0000	0.000E+00	0.0000	7.594E-05	0.1026	0.000E+00	0.0000	0.000E+00	0.0000	5.665E-06	0.0077
Ra-228	1.727E-05	0.0233	1.015E-09	0.0000	0.000E+00	0.0000	2.338E-06	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	2.297E-07	0.0003
Th-228	3.421E-07	0.0005	2.748E-11	0.0000	0.000E+00	0.0000	8.336E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.168E-09	0.0000
Th-230	3.269E-06	0.0044	4.477E-09	0.0000	0.000E+00	0.0000	7.355E-07	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	4.759E-07	0.0006
Th-232	1.636E-04	0.2210	1.130E-08	0.0000	0.000E+00	0.0000	3.537E-05	0.0478	0.000E+00	0.0000	0.000E+00	0.0000	2.755E-06	0.0037
U-234	8.918E-09	0.0000	1.664E-09	0.0000	0.000E+00	0.0000	3.567E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	3.208E-07	0.0004
U-235	1.452E-06	0.0020	1.178E-10	0.0000	0.000E+00	0.0000	2.914E-08	0.000C	0.000E+00	0.0000	0.000E+00	0.0000	2.641E-08	0.0000
U-238	3.803E-06	0.0051	1.364E-09	0.0000	0.000E+00	0.0000	4.505E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	4.264E-07	0.0006

Total 5.667E-04 0.7654 2.936E-08 0.0000 0.000E+00 0.0000 1.589E-04 0.2147  
RESRAD, Version 6.5 T<sub>4</sub> Limit = 180 days 11/05/2013 15:11 Page 20  
Intrinsic : DT-9 Levee Accessible Soil Resident  
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Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t = 1.000E+01 years

### Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Radio-Nuclide	risk	fract.	risk	fract.										
Ac-227	0.000E+00	0.0000	9.270E-07	0.0013										
Pa-231	0.000E+00	0.0000	5.906E-06	0.0080										
Pb-210	0.000E+00	0.0000	4.702E-05	0.0635										
Ra-226	0.000E+00	0.0000	4.527E-04	0.6115										
Ra-228	0.000E+00	0.0000	2.034E-05	0.0275										
Th-228	0.000E+00	0.0000	3.451E-07	0.0005										
Th-230	0.000E+00	0.0000	4.485E-06	0.0061										
Th-232	0.000E+00	0.0000	2.018E-04	0.2725										
U-234	0.000E+00	0.0000	6.881E-07	0.0009										
U-235	0.000E+00	0.0000	1.508E-06	0.0020										
U-238	0.000E+00	0.0000	4.681E-06	0.0063										
Total	0.000E+00	0.0000	7.403E-04	1.0000										

\*\*\*CNRSI(i,p,t) includes contribution from decay daughter radionuclides  
RESRAD, Version 6.5 T<sub>1/2</sub> Limit = 180 days 11/05/2013 15:11 Page 21  
Intrinsic : DT-9 Levee Accessible Soil Resident  
File : C:\RESRAD FAMILY\RESRAD\6.5\USERFILES\DT9 LEVEE ACCESS RES.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/vr at t = 3.000E+01 years

Pa-231	7.697E-04	7.879E+01	0.000E+00	0.000E+00	1.071E+01	0.000E+00	8.950E+01						
Po-210	7.204E-03	7.396E+02	0.000E+00	0.000E+00	1.002E+02	0.000E+00	8.398E+02						
Ra-226	6.409E-03	2.624E+03	0.000E+00	0.000E+00	8.916E+01	0.000E+00	2.713E+03						
Ra-228	2.161E-03	8.811E+02	0.000E+00	0.000E+00	3.006E+01	0.000E+00	9.112E+02						
Th-228	2.159E-03	3.290E+01	0.000E+00	0.000E+00	3.003E+01	0.000E+00	6.293E+01						
Th-230	5.205E-03	5.332E+01	0.000E+00	0.000E+00	7.242E+01	0.000E+00	1.257E+02						
Th-232	2.175E-03	2.228E+01	0.000E+00	0.000E+00	3.026E+01	0.000E+00	5.253E+01						
U-234	4.846E-03	1.240E+02	0.000E+00	0.000E+00	6.742E+01	0.000E+00	1.915E+02						
U-235	3.850E-04	9.854E+00	0.000E+00	0.000E+00	5.356E+00	0.000E+00	1.521E+01						
U-238	4.846E-03	1.240E+02	0.000E+00	0.000E+00	6.742E+01	0.000E+00	1.915E+02						

\* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil  
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of  
Radon and its Decay Products as pCi/yr at t= 3.000E+01 years

0

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependent

RESRAD, Version 6.5      T½ Limit = 180 days      11/05/2013 15:11 Page 22

Intrinsic : DT-9 Levee Accessible Soil Resident

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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+01 years

0

Water Independent Pathways (Inhalation excludes radon)

0

Radio-Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	6.127E-06	0.0084	3.785E-09	0.0000	3.045E-07	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	2.931E-07	0.0004
Pa-231	7.305E-07	0.0010	1.039E-09	0.0000	5.284E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	1.189E-07	0.0002
Pb-210	2.007E-07	0.0003	2.868E-09	0.0000	7.300E-05	0.0997	0.000E+00	0.0000	0.000E+00	0.0000	7.647E-06	0.0104
Ra-226	3.698E-04	0.5050	2.204E-09	0.0000	4.016E-05	0.0548	0.000E+00	0.0000	0.000E+00	0.0000	1.936E-06	0.0026
Ra-228	6.730E-05	0.0919	3.395E-10	0.0000	3.793E-05	0.0518	0.000E+00	0.0000	0.000E+00	0.0000	2.065E-06	0.0028
Th-228	1.152E-04	0.1574	9.259E-09	0.0000	4.177E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	7.304E-07	0.0010
Th-230	2.961E-08	0.0000	4.451E-09	0.0000	1.904E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	4.389E-07	0.0006
Th-232	5.176E-09	0.0000	2.825E-09	0.0000	8.889E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	2.097E-07	0.0003
U-234	8.405E-09	0.0000	1.640E-09	0.0000	3.516E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	3.162E-07	0.0004
U-235	1.431E-06	0.0020	1.154E-10	0.0000	2.856E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.597E-08	0.0000
U-238	3.749E-06	0.0051	1.345E-09	0.0000	4.441E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	4.203E-07	0.0006
Total	5.647E-04	0.7710	2.987E-08	0.0000	1.535E-04	0.2095	0.000E+00	0.0000	0.000E+00	0.0000	1.420E-05	0.0194

0

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at  $t = 3.000E+01$  years

## Water Dependent Pathways

	Water		Fish		Plant		Meat		Milk		All Pathways**	
Radio-Nuclide	risk	fract.	risk	fract.								
Ac-227	0.000E+00	0.0000	6.729E-06	0.0092								
Pa-231	0.000E+00	0.0000	1.379E-06	0.0019								
Pb-210	0.000E+00	0.0000	8.085E-05	0.1104								
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	4.119E-04	0.5625
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	1.073E-04	0.1465
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	1.164E-04	0.1589
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	6.633E-07	0.0009
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	3.066E-07	0.0004
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	6.778E-07	0.0009
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000G	0.000E+00	0.0000	1.485E-06	0.0020
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000G	0.000E+00	0.0000	4.614E-06	0.0063
Total	0.000E+00	0.0000	7.323E-04	1.0000								

\*\* Sum of water independent ground, inhalation, plant, meat, milk, soil and water dependent water, fish, plant, meat, milk pathways

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Intrinsic : DT-9 Levee Accessible Soil Resident  
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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
 Radon and its Decay Products at t= 3.000E+01 years  
 Radionuclides

0

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E-00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent      Water-dep. == Water-dependent

Q

Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t = 3.00E+01 years

Q

Water Independent Pathways (Inhalation excludes radon)

Q

Ac-227	4.311E-07	0.0006	2.663E-10	0.0000	0.000E+00	0.0000	2.133E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.062E-08	0.0000
Pa-231	6.425E-06	0.0088	4.556E-09	0.0000	0.000E+00	0.0000	8.112E-07	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	3.912E-07	0.0005
Pb-210	6.241E-08	0.0001	8.917E-10	0.0000	0.000E+00	0.0000	2.263E-05	0.0309	0.000E+00	0.0000	0.000E+00	0.0000	2.378E-06	0.0032
Ra-226	3.642E-04	0.4973	4.126E-09	0.0000	0.000E+00	0.0000	8.941E-05	0.1221	0.000E+00	0.0000	0.000E+00	0.0000	7.124E-06	0.0097
Ra-228	1.568E-06	0.0021	9.292E-11	0.0000	0.000E+00	0.0000	2.521E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	2.062E-08	0.0000
Th-228	2.438E-10	0.0000	1.959E-14	0.0000	0.000E+00	0.0000	5.942E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.545E-12	0.0000
Th-230	5.810E-06	0.0079	4.503E-09	0.0000	0.000E+00	0.0000	1.312E-06	0.0018	0.000E+00	0.0000	0.000E+00	0.0000	5.206E-07	0.0007
Th-232	1.810E-04	0.2471	1.233E-08	0.0000	0.000E+00	0.0000	3.819E-05	0.0521	0.000E+00	0.0000	0.000E+00	0.0000	2.984E-06	0.0041
U-234	9.564E-09	0.0000	1.641E-09	0.0000	0.000E+00	0.0000	3.518E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	3.163E-07	0.0004
U-235	1.433E-06	0.0020	1.170E-10	0.0000	0.000E+C0	0.0000	2.889E-08	0.000C	0.000E+00	0.0000	0.000E+00	0.0000	2.611E-08	0.0000
U-238	3.749E-06	0.0051	1.345E-09	0.0000	0.000E+C0	0.0000	4.441E-07	0.000E	0.000E+00	0.0000	0.000E+00	0.0000	4.203E-07	0.0006
Total	5.647E-04	0.7710	2.987E-08	0.0000	0.000E+00	0.0000	1.535E-04	0.2095	0.000E+00	0.0000	0.000E+00	0.0000	1.420E-05	0.0194

Total 3.64E-04 0.7710 2.50E-08 0.0000 0.000E+00 0.000E+00 1.35E-04 0.2000  
RESRAD, Version 6.5 T<sup>1/2</sup> Limit = 180 days 11/05/2013 15:11 Page 24  
Intrinsic : DT-9 Levee Accessible Soil Resident  
File : C:\RESRAD FAMILY\RESRAD\6.5\USERFILES\DT9 LEVEE ACCESS RES.RAD

Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t = 3.000E+01 years

## Water Dependent Pathways

Radio-Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.										
Ac-227	0.000E+00	0.0000	4.734E-07	0.0006										
Pa-231	0.000E+00	0.0000	7.632E-06	0.0104										
Pt-210	0.000E+00	0.0000	2.507E-05	0.0342										
Ra-226	0.000E+00	0.0000	4.607E-04	0.6291										
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+03	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.841E-06	0.0025
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+03	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.460E-10	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+03	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.647E-06	0.0104
Th-232	0.000E+00	0.0000	2.222E-04	0.3034										
U-234	0.00CE+00	0.0000	0.000E+00	0.0000	6.794E-07	0.0009								
U-235	0.00CE+00	0.0000	0.000E+00	0.0000	1.488E-06	0.0020								
U-238	0.00CE+00	0.0000	0.000E+00	0.0000	4.615E-06	0.0063								
Total	0.00CE+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.00CE+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.323E-04	1.0000

\*\*\*CNRSI(i,p,t) includes contribution from decay daughter radionuclides  
RESRAD, Version 6.5 T<sub>1/2</sub> Limit = 180 days 12/05/2013 15:11 Page 25  
Intrinsic : DT-9 Levee Accessible Soil Resident  
File : C:\RESRAD FAMILY\RESRAD\6.5\USERFILES\DT9 LEVEE ACCESS RES.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t = 1.000E+02 years

**Water Independent Pathways (Inhalation w/o radon)**      **Water Dependent Pathways**

Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	6.883E-04	1.768E+01	0.000E+00	0.000E+00	9.576E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.726E+01
Pa-231	7.316E-04	7.489E+01	0.000E+00	0.000E+00	1.018E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.507E+01
Pb-210	6.279E-03	6.448E+02	0.000E+00	0.000E+00	8.736E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.321E+02
Ra-226	6.151E-03	2.519E+03	0.000E+00	0.000E+00	8.558E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.604E+03
Ra-228	2.165E-03	8.830E+02	0.000E+00	0.000E+00	3.013E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.131E+02
Th-228	2.165E-03	3.299E+01	0.000E+00	0.000E+00	3.013E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.312E+01
Th-230	5.205E-03	5.332E+01	0.000E+00	0.000E+00	7.241E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.257E+02
Th-232	2.175E-03	2.228E+01	0.000E+00	0.000E+00	3.026E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.253E+01
U-234	4.610E-03	1.180E+02	0.000E+00	0.000E+00	6.413E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.821E+02
U-235	3.662E-04	9.373E+00	0.000E+00	0.000E+00	5.095E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.447E+01
U-238	4.610E-03	1.180E+02	0.000E+00	0.000E+00	6.413E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.821E+02

\* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil  
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of  
Radon and its Decay Products as pCi/yr at t= 1.000E+02 years  
Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependert  
RESRAD, Version 6.5      T½ Limit = 180 days      11/05/2013 15:11 Page 26  
Intrinsic : DT-9 Levee Accessible Soil Resident  
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Radio-Nuclide	Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 1.000E+02 years											
	Water Independent Pathways (Inhalation excludes radon)											
	Ground		Inhalation		Plant		Meat		Milk		Soil	
risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk
Ac-227	6.973E-06	0.0098	4.307E-09	0.0000	3.462E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	3.335E-07	0.0005
Pa-231	6.943E-07	0.0010	9.878E-10	0.0000	5.023E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	1.130E-07	0.0002
Pb-210	1.807E-07	0.0003	2.581E-09	0.0000	6.572E-05	0.0928	0.000E+00	0.0000	0.000E+00	0.0000	6.883E-06	0.0097
Ra-226	3.551E-04	0.5011	2.116E-09	0.0000	3.856E-05	0.0544	0.000E+00	0.0000	0.000E+00	0.0000	1.859E-06	0.0026
Ra-228	6.734E-05	0.0950	3.397E-10	0.0000	3.796E-05	0.0536	0.000E+00	0.0000	0.000E+00	0.0000	2.066E-06	0.0029
Th-228	1.153E-04	0.1628	9.267E-09	0.0000	4.181E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	7.310E-07	0.0010
Th-230	2.961E-08	0.0000	4.450E-09	0.0000	1.903E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	4.388E-07	0.0006
Th-232	5.176E-09	0.0000	2.825E-09	0.0000	8.888E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	2.097E-07	0.0003
U-234	7.995E-09	0.0000	1.560E-09	0.0000	3.345E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	3.008E-07	0.0004
U-235	1.361E-06	0.0019	1.098E-10	0.0000	2.716E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.470E-08	0.0000

U-238	3.566E-06	0.0050	1.279E-09	0.0000	4.224E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	3.998E-07	0.0006
Total	5.506E-04	0.7771	2.982E-08	0.0000	1.446E-04	0.2040	0.000E+00	0.0000	0.000E+00	0.0000	1.336E-05	0.0189

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+02 years

#### Water Dependent Pathways

Radio-Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Ac-227	0.000E+00	0.0000	7.657E-06	0.0108								
Pa-231	0.000E+00	0.0000	1.311E-06	0.0018								
Pb-210	0.000E+00	0.0000	7.279E-05	0.1027								
Ra-226	0.000E+00	0.0000	3.955E-04	0.5582								
Ra-228	0.000E+00	0.0000	1.074E-04	0.1515								
Th-228	0.000E+00	0.0000	1.165E-04	0.1644								
Th-230	0.000E+00	0.0000	6.632E-07	0.0009								
Th-232	0.000E+00	0.0000	3.066E-07	0.0004								
J-234	0.000E+00	0.0000	6.448E-07	0.0009								
U-235	0.000E+00	0.0000	1.413E-06	0.0020								
U-238	0.000E+00	0.0000	4.389E-06	0.0062								
Total	0.000E+00	0.0000	7.085E-04	1.0000								

\*\* Sum of water independent ground, inhalation, plant, meat, milk, soil  
and water dependent water, fish, plant, meat, milk pathways

RESRAD, Version 6.5      T½ Limit = 180 days      11/05/2013 15:11 Page 27

Intrinsic : DT-9 Levee Accessible Soil Resident

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,:,t) for Inhalation of  
Radon and its Decay Products at t= 1.000E+02 years

Radionuclides								
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Ground	Inhalation	Radon	Plant	Meat	Milk	Soil
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Radio-Nuclide	risk	fract.												
Ac-227	4.101E-08	0.0001	2.533E-11	0.0000	0.000E+00	0.0000	2.029E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.962E-09	0.0000
Pa-231	7.619E-06	0.0108	5.264E-09	0.0000	0.000E+00	0.0000	8.455E-07	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	4.441E-07	0.0006
Pb-210	6.909E-09	0.0000	9.871E-11	0.0000	0.000E+00	0.0000	2.505E-06	0.0035	0.000E+00	0.0000	0.000E+00	0.0000	2.632E-07	0.0004
Ra-226	3.409E-04	0.4812	4.439E-09	0.0000	0.000E+00	0.0000	9.832E-05	0.1383	0.000E+00	0.0000	0.000E+00	0.0000	8.205E-06	0.0116
Ra-228	3.275E-10	0.0000	1.941E-14	0.0000	0.000E+00	0.0000	5.264E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.307E-12	0.0000
Th-228	2.357E-21	0.0000	1.894E-25	0.0000	0.000E+00	0.0000	5.745E-24	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	1.494E-23	0.0000
Th-230	1.433E-05	0.0202	4.606E-09	0.0000	0.000E+00	0.0000	3.646E-06	0.0051	0.000E+00	0.0000	0.000E+00	0.0000	7.124E-07	0.0010
Th-232	1.827E-04	0.2578	1.243E-08	0.0000	0.000E+00	0.0000	3.846E-05	0.0543	0.000E+00	0.0000	0.000E+00	0.0000	3.006E-06	0.0042
U-234	1.503E-08	0.0000	1.563E-09	0.0000	0.000E+00	0.0000	3.360E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	3.012E-07	0.0004
U-235	1.368E-06	0.0019	1.149E-10	0.0000	0.000E+00	0.0000	2.809E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.515E-08	0.0000
U-238	3.566E-06	0.0050	1.280E-09	0.0000	0.000E+00	0.0000	4.225E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	3.999E-07	0.0006
Total	5.506E-04	0.7771	2.982E-08	0.0000	0.000E+00	0.0000	1.446E-04	0.2040	0.000E+00	0.0000	0.000E+00	0.0000	1.336E-05	0.0189

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Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t = 1.000E+02 years

#### Water Dependent Pathways

Radio-Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.										
Ac-227	0.000E+00	0.0000	4.503E-08	0.0001										
Pa-231	0.000E+00	0.0000	8.914E-06	0.0126										
Pb-210	0.000E+00	0.0000	2.775E-06	0.0039										
Ra-226	0.000E+00	0.0000	4.474E-04	0.6315										
Ra-228	0.000E+00	0.0000	3.844E-10	0.0000										
Th-228	0.000E+00	0.0000	2.378E-21	0.0000										
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0C00	0.000E+00	0.0000	0.000E+00	0.0000	1.869E-05	0.0264
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0C00	0.000E+00	0.0000	0.000E+00	0.0000	2.242E-04	0.3164
U-234	0.000E+00	0.0000	6.538E-07	0.0009										
U-235	0.000E+00	0.0000	1.422E-06	0.0020										
U-238	0.000E+00	0.0000	4.390E-06	0.0062										
Total	0.000E+00	0.0000	7.085E-04	1.0000										

\*\*\*CNRSI(i,p,t) includes contribution from decay daughter radionuclides  
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t= 3.000E+02 years

Radio-Nuclide	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total Ingestion*
	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	
Ac-227	6.126E-04	1.574E+01	0.000E+00	0.000E+00	8.524E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.426E+01
Pa-231	6.328E-04	6.478E+01	0.000E+00	0.000E+00	8.804E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.358E+01
Pb-210	5.536E-03	5.685E+02	0.000E+00	0.000E+00	7.703E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.456E+02
Ra-226	5.503E-03	2.253E+03	0.000E+00	0.000E+00	7.657E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.330E+03
Ra-228	2.165E-03	8.829E+02	0.000E+00	0.000E+00	3.012E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.130E+02
Th-228	2.165E-03	3.299E+01	0.000E+00	0.000E+00	3.012E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.311E+01
Th-230	5.203E-03	5.330E+01	0.000E+00	0.000E+00	7.238E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.257E+02
Th-232	2.174E-03	2.227E+01	0.000E+00	0.000E+00	3.025E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.253E+01
U-234	3.996E-03	1.023E+02	0.000E+00	0.000E+00	5.559E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.579E+02
U-235	3.174E-04	8.125E+00	0.000E+00	0.000E+00	4.416E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.254E+01
U-238	3.996E-03	1.023E+02	0.000E+00	0.000E+00	5.559E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.579E+02

\* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of Radon and its Decay Products as pCi/yr at t = 3.000E+02 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent      Water-dep. == Water-dependent  
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Radio-Nuclide	Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 3.000E+02 years									
	Water Independent Pathways (Inhalation excludes radon)									
Ground	Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	6.142E-06	0.0094	3.794E-09	0.0000	3.049E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	6.005E-07	0.0009	8.545E-10	0.0000	4.344E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000
Pb-210	1.601E-07	0.0002	2.288E-09	0.0000	5.825E-05	0.0887	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	3.179E-04	0.4839	1.894E-09	0.0000	3.452E-05	0.0526	0.000E+00	0.0000	0.000E+00	0.0000
Ra-228	6.733E-05	0.1025	3.397E-10	0.0000	3.795E-05	0.0578	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	1.153E-04	0.1756	9.266E-09	0.0000	4.180E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	2.959E-08	0.0000	4.448E-09	0.0000	1.903E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0007

Th-232	5.175E-09	0.0000	2.825E-09	0.0000	8.887E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	2.096E-07	0.0003
U-234	6.930E-09	0.0000	1.352E-09	0.0000	2.899E-07	0.0004	0.000E+00	0.000C	0.000E+00	0.0000	2.607E-07	0.0004
U-235	1.180E-06	0.0018	9.517E-11	0.0000	2.355E-08	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	2.141E-08	0.0000
U-238	3.091E-06	0.0047	1.109E-09	0.0000	3.661E-07	0.0006	0.000E+00	0.000C	0.000E+00	0.0000	3.465E-07	0.0005
Total	5.117E-04	0.7791	2.826E-08	0.0000	1.328E-04	0.2022	0.000E+00	0.0000	0.000E+00	0.0000	1.223E-05	0.0186

0

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+02 years

#### Water Dependent Pathways

Radio-Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Ac-227	0.000E+00	0.0000	6.744E-06	0.0103								
Pa-231	0.000E+00	0.0000	1.134E-06	0.0017								
Pb-210	0.000E+00	0.0000	6.451E-05	0.0982								
Ra-226	0.000E+00	0.0000	3.540E-04	0.5390								
Ra-228	0.000E+00	0.0000	1.073E-04	0.1634								
Th-228	0.000E+00	0.0000	1.165E-04	0.1773								
Th-230	0.000E+00	0.0000	6.629E-07	0.0010								
Th-232	0.000E+00	0.0000	3.065E-07	0.0005								
U-234	0.000E+00	0.0000	5.589E-07	0.0009								
U-235	0.000E+00	0.0000	1.225E-06	0.0019								
U-238	0.000E+00	0.0000	3.805E-06	0.0058								
Total	0.000E+00	0.0000	6.568E-04	1.0000								

\*\* Sum of water independent ground, inhalation, plant, meat, milk, soil  
and water dependent water, fish, plant, meat, milk pathways

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
Radon and its Decay Products at t= 3.000E+02 years  
Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependent

0

Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)

and Fraction of Total Risk at t= 3.000E+02 years														
Water Independent Pathways (Inhalation excludes radon)														
	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	4.942E-11	0.0000	3.052E-14	0.0000	0.000E+00	0.0000	2.445E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.364E-12	0.0000
Pa-231	6.722E-06	0.0102	4.634E-09	0.0000	0.000E+00	0.0000	7.370E-07	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	3.903E-07	0.0006
Pb-210	1.284E-11	0.0000	1.834E-13	0.0000	0.000E+00	0.0000	4.655E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.891E-10	0.0000
Ra-226	2.822E-04	0.4297	3.739E-09	0.0000	0.000E+00	0.0000	8.301E-05	0.1264	0.000E+00	0.0000	0.000E+00	0.0000	6.963E-06	0.0106
Ra-228	1.001E-20	0.0000	5.930E-25	0.0000	0.000E+00	0.0000	1.609E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.316E-22	0.0000
Th-228	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
Th-230	3.576E-05	0.0544	4.880E-09	0.0000	0.000E+00	0.0000	9.928E-06	0.0151	0.000E+00	0.0000	0.000E+00	0.0000	1.238E-06	0.0019
Th-232	1.827E-04	0.2781	1.243E-08	0.0000	0.000E+00	0.0000	3.846E-05	0.0586	0.000E+00	0.0000	0.000E+00	0.0000	3.006E-06	0.0046
U-234	5.392E-08	0.0001	1.362E-09	0.0000	0.000E+00	0.0000	3.022E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	2.625E-07	0.0004
U-235	1.200E-06	0.0018	1.094E-10	0.0000	0.000E+00	0.0000	2.591E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.262E-08	0.0000
U-238	3.091E-06	0.0047	1.110E-09	0.0000	0.000E+00	0.0000	3.664E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	3.468E-07	0.0005
Total	5.117E-04	0.7791	2.826E-08	0.0000	0.000E+00	0.0000	1.328E-04	0.2022	0.000E+00	0.0000	0.000E+00	0.0000	1.223E-05	0.0186

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Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
 and Fraction of Total Risk at t= 3.000E+02 years

#### Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Radio-Nuclide	risk	fract.	risk	fract.										
Ac-227	0.000E+00	0.0000	5.426E-11	0.0000										
Pa-231	0.000E+00	0.0000	7.853E-06	0.0120										
Pb-210	0.000E+00	0.0000	5.157E-09	0.0000										
Ra-226	0.000E+00	0.0000	3.722E-04	0.5667										
Ra-228	0.000E+00	0.0000	1.175E-20	0.0000										
Th-228	0.000E+00	0.0000	0.000E+00	0.0000										
Th-230	0.000E+00	0.0000	4.693E-05	0.0714										
Th-232	0.000E+00	0.0000	2.241E-04	0.3413										
U-234	0.000E+00	0.0000	6.200E-07	0.0009										
U-235	0.000E+00	0.0000	1.249E-06	0.0019										
U-238	0.000E+00	0.0000	3.805E-06	0.0058										
Total	0.000E+00	0.0000	6.568E-04	1.0000										

\*\*\*CNRSI(i,p,t) includes contribution from decay daughter radionuclides  
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t= 1.000E+03 years

Radio-Nuclide	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total Ingestion*
	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	
Ac-227	3.688E-04	9.472E+00	0.000E+00	0.000E+00	5.131E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.460E+01
Pa-231	3.809E-04	3.899E+01	0.000E+00	0.000E+00	5.299E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.429E+01
Pb-210	3.998E-03	4.105E+02	0.000E+00	0.000E+00	5.562E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.662E+02
Ra-226	3.994E-03	1.635E+03	0.000E+00	0.000E+00	5.556E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.691E+03
Ra-228	2.164E-03	8.825E+02	0.000E+00	0.000E+00	3.011E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.126E+02
Th-228	2.164E-03	3.297E+01	0.000E+00	0.000E+00	3.011E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.308E+01
Th-230	5.188E-03	5.314E+01	0.000E+00	0.000E+00	7.217E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.253E+02
Th-232	2.173E-03	2.226E+01	0.000E+00	0.000E+00	3.024E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.250E+01
U-234	2.423E-03	6.202E+01	0.000E+00	0.000E+00	3.371E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.572E+01
U-235	1.925E-04	4.927E+00	0.000E+00	0.000E+00	2.678E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.604E+00
U-238	2.423E-03	6.202E+01	0.000E+00	0.000E+00	3.371E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.572E+01

\* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil  
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of  
Radon and its Decay Products as pCi/yr at t= 1.000E+03 years

0

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependent

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Intrisk : DT-9 Levee Accessible Soil Resident

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0

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+03 years

0

Radio-Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	3.697E-06	0.0069	2.283E-09	0.0000	1.835E-07	0.0003	C.000E+00	0.0000	0.000E+00	0.0000	1.768E-07	0.0003
Pa-231	3.615E-07	0.0007	5.143E-10	0.0000	2.615E-07	0.0005	C.000E+00	0.0000	0.000E+00	0.0000	5.882E-08	0.0001
Pb-210	1.159E-07	0.0002	1.656E-09	0.0000	4.216E-05	0.0785	C.000E+00	0.0000	0.000E+00	0.0000	4.415E-06	0.0082
Ra-226	2.312E-04	0.4305	1.378E-09	0.0000	2.511E-05	0.0468	C.000E+00	0.0000	0.000E+00	0.0000	1.210E-06	0.0023

Ra-228	6.730E-05	0.1253	3.395E-10	0.0000	3.793E-05	0.0706	0.000E+00	0.0000	0.000E+00	0.0000	2.065E-06	0.0038
Th-228	1.153E-04	0.2147	9.262E-09	0.0000	4.178E-07	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	7.306E-07	0.0014
Th-230	2.951E-08	0.0001	4.435E-09	0.0000	1.897E-07	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	4.373E-07	0.0008
Th-232	5.173E-09	0.0000	2.823E-09	0.0000	8.884E-08	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.096E-07	0.0004
U-234	4.202E-09	0.0000	8.198E-10	0.0000	1.758E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	1.581E-07	0.0003
U-235	7.153E-07	0.0013	5.770E-11	0.0000	1.428E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.298E-08	0.0000
U-238	1.874E-06	0.0035	6.724E-10	0.0000	2.220E-07	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	2.101E-07	0.0004
Total	4.206E-04	0.7831	2.424E-08	0.0000	1.068E-04	0.1988	0.000E+00	0.0000	0.000E+00	0.0000	9.685E-06	0.0180

0

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t = 1.000E+03 years

#### Water Dependent Pathways

Radio-Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Ac-227	0.000E+00	0.0000	4.059E-06	0.0076								
Pa-231	0.000E+00	0.0000	6.823E-07	0.0013								
Po-210	0.000E+00	0.0000	4.669E-05	0.0869								
Ra-226	0.000E+00	0.0000	2.575E-04	0.4795								
Ra-228	0.000E+00	0.0000	1.073E-04	0.1998								
Th-228	0.000E+00	0.0000	1.164E-04	0.2168								
Th-230	0.000E+00	0.0000	6.610E-07	0.0012								
Th-232	0.000E+00	0.0000	3.064E-07	0.0006								
U-234	0.000E+00	0.0000	3.389E-07	0.0006								
U-235	0.000E+00	0.0000	7.426E-07	0.0014								
U-238	0.000E+00	0.0000	2.307E-06	0.0043								
Total	0.000E+00	0.0000	5.370E-04	1.0000								

\*\* Sum of water independent ground, inhalation, plant, meat, milk, soil  
and water dependent water, fish, plant, meat, milk pathways

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Intrinsic : DT-9 Levee Accessible Soil Resident

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
Radon and its Decay Products at t= 1.000E+03 years  
Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

0

Water-ind. == Water-independent      Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 1.00E+03 years														
Water Independent Pathways (Inhalation excludes radon)														
Radio-Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	3.000E-21	0.0000	1.853E-24	0.0000	0.000E+00	0.0000	1.485E-22	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.435E-22	0.0000
Pa-231	4.016E-06	0.0075	2.768E-09	0.0000	0.000E+00	0.0000	4.403E-07	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	2.332E-07	0.0004
Pb-210	3.550E-21	0.0000	5.071E-23	0.0000	0.000E+00	0.0000	1.287E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.352E-19	0.0000
Ra-226	1.457E-04	0.2713	1.930E-09	0.0000	0.000E+00	0.0000	4.286E-05	0.0798	0.000E+00	0.0000	0.000E+00	0.0000	3.595E-06	0.0067
Ra-228	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
Th-228	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
Th-230	8.530E-05	0.1588	5.507E-09	0.0000	0.000E+00	0.0000	2.450E-05	0.0456	0.000E+00	0.0000	0.000E+00	0.0000	2.458E-06	0.0046
Th-232	1.826E-04	0.3400	1.242E-08	0.0000	0.000E+00	0.0000	3.844E-05	0.0716	0.000E+00	0.0000	0.000E+00	0.0000	3.005E-06	0.0056
U-234	3.404E-07	0.0006	8.490E-10	0.0000	0.000E+00	0.0000	2.706E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	1.681E-07	0.0003
U-235	7.577E-07	0.0014	8.701E-11	0.0000	0.000E+00	0.0000	1.900E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.546E-08	0.0000
U-238	1.875E-06	0.0035	6.748E-10	0.0000	0.000E+00	0.0000	2.226E-07	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	2.106E-07	0.0004
Total	4.206E-04	0.7831	2.424E-08	0.0000	0.000E+00	0.0000	1.068E-04	0.1983	0.000E+00	0.0000	0.000E+00	0.0000	9.685E-06	0.0180

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Intrinsic : DT-9 Levee Accessible Soil Resident

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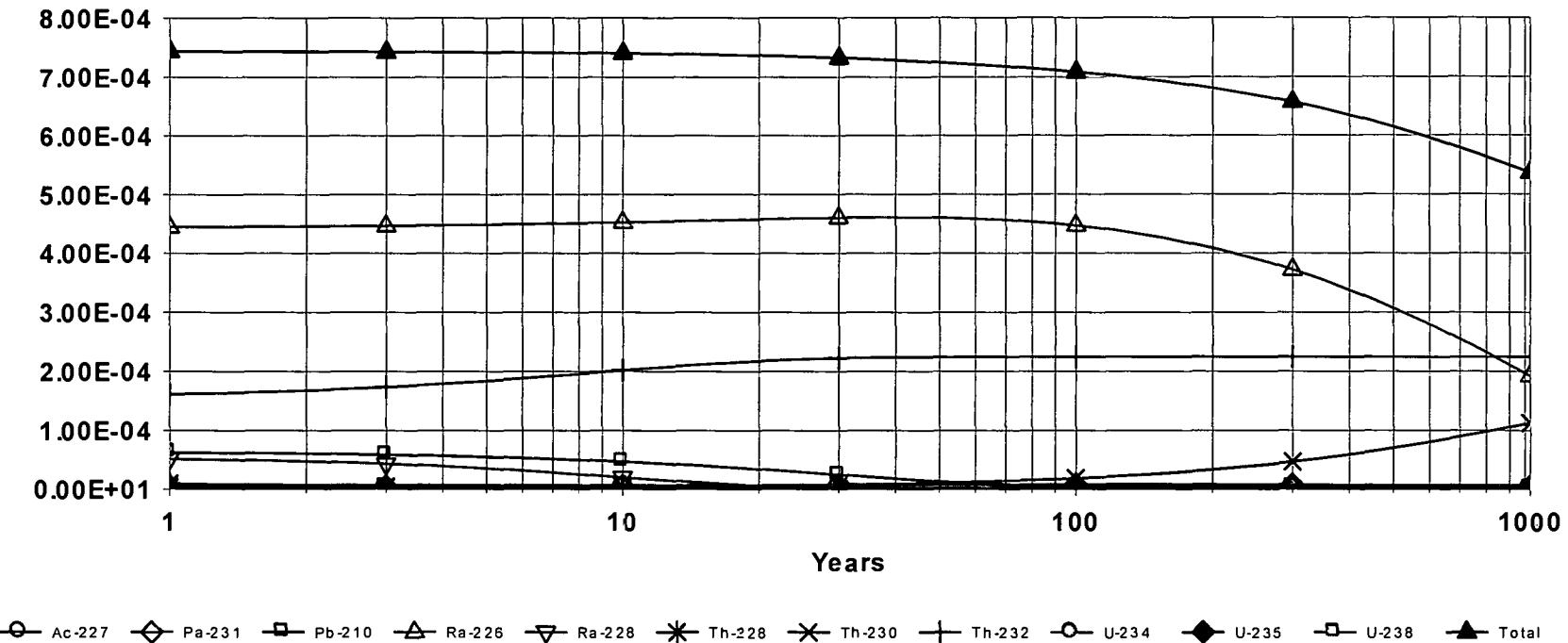
Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.00E+03 years

#### Water Dependent Pathways

Radio-Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.										
Ac-227	0.000E+00	0.0000	3.294E-21	0.0000										
Pa-231	0.000E+00	0.0000	4.692E-06	0.0087										
Pb-210	0.000E+00	0.0000	1.426E-18	0.0000										
Ra-226	0.000E+00	0.0000	1.922E-04	0.3578										
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000										
Th-228	0.000E+00	0.0000	0.000E+00	0.0000										
Th-230	0.000E+00	0.0000	0.000E+00	0.0000										
Th-232	0.000E+00	0.0000	1.123E-04	0.2090										
U-234	0.000E+00	0.0000	2.240E-04	0.4172										
U-235	0.000E+00	0.0000	7.800E-07	0.0015										
U-238	0.000E+00	0.0000	7.923E-07	0.0015										
Total	0.000E+00	0.0000	5.370E-04	1.0000										

\*\*\*CNRSI(i,p,t) includes contribution from decay daughter radionuclides

### EXCESS CANCER RISK: All Nuclides Summed, All Pathways Summed



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**Attachment C**

**RESRAD Output for Radiological Cancer Risks Estimated for Resident Gardener  
Exposures to Inaccessible Soil at DT-15**

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Inrisk : DT-15 ISOU Resident  
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Risk Slope and ETRG for the Ground Pathway .....	4
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Time= 3.000E+00 .....	13
Time= 1.000E+01 .....	17
Time= 3.000E+01 .....	21
Time= 1.000E+02 .....	25
Time= 3.000E+02 .....	29
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Cancer Risk Slope Factors Summary Table  
Risk Library: HEAST 2001 Morbidity

0 Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Ac-227+D	1.47E-06	3.48E-10	SLPF( 1,1)
Sf-1	Pa-231	1.39E-07	1.39E-07	SLPF( 2,1)
Sf-1	Pb-210+D	4.21E-09	1.41E-09	SLPF( 3,1)
Sf-1	Ra-226+D	8.49E-06	2.29E-08	SLPF( 4,1)
Sf-1	Ra-228+D	4.53E-06	0.00E+00	SLPF( 5,1)
Sf-1	Th-228+D	7.76E-06	5.59E-09	SLPF( 6,1)
Sf-1	Th-230	8.19E-10	8.19E-10	SLPF( 7,1)
Sf-1	Th-232	3.42E-10	3.42E-10	SLPF( 8,1)
Sf-1	U-234	2.52E-10	2.52E-10	SLPF( 9,1)
Sf-1	U-235+D	5.43E-07	5.18E-07	SLPF( 10,1)
Sf-1	U-238	4.99E-11	4.99E-11	SLPF( 11,1)
Sf-1	U-238+D	1.14E-07	4.99E-11	SLPF( 12,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Ac-227+D	2.09E-07	1.49E-07	SLPF( 1,2)
Sf-2	Pa-231	4.55E-08	4.55E-08	SLPF( 2,2)
Sf-2	Pb-210+D	1.39E-08	2.77E-09	SLPF( 3,2)
Sf-2	Ra-226+D	1.15E-08	1.15E-08	SLPF( 4,2)
Sf-2	Ra-228+D	5.23E-09	5.18E-09	SLPF( 5,2)
Sf-2	Th-228+D	1.43E-07	1.32E-07	SLPF( 6,2)

Sf-2	Th-230	2.85E-08	2.85E-08	SLPF( 7,2)
Sf-2	Th-232	4.33E-08	4.33E-08	SLPF( 8,2)
Sf-2	U-234	1.14E-08	1.14E-08	SLPF( 9,2)
Sf-2	U-235+D	1.01E-08	1.01E-08	SLPF( 10,2)
Sf-2	J-238	9.32E-09	9.32E-09	SLPF( 11,2)
Sf-2	J-238+D	9.35E-09	9.32E-09	SLPF( 12,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF( 1,3)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF( 2,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF( 3,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF( 4,3)
Sf-3	Ra-228+D	1.43E-09	1.43E-09	SLPF( 5,3)
Sf-3	Th-228+D	4.22E-10	1.48E-10	SLPF( 6,3)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF( 7,3)
Sf-3	Th-232	1.33E-10	1.33E-10	SLPF( 8,3)
Sf-3	U-234	9.55E-11	9.55E-11	SLPF( 9,3)
Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF( 10,3)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF( 11,3)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF( 12,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	4.86E-10	2.01E-10	SLPF( 1,4)
Sf-3	Pa-231	1.73E-10	1.73E-10	SLPF( 2,4)
Sf-3	Pb-210+D	1.27E-09	8.81E-10	SLPF( 3,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF( 4,4)
Sf-3	Ra-228+D	1.04E-09	1.04E-09	SLPF( 5,4)
Sf-3	Th-228+D	3.00E-10	1.07E-10	SLPF( 6,4)
Sf-3	Th-230	9.10E-11	9.10E-11	SLPF( 7,4)

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Cancer Risk Slope Factors Summary Table (continued)  
Risk Library: HEAST 2001 Morbidity

0 Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-3	Th-232	1.01E-10	1.01E-10	SLPF( 8,4)
Sf-3	U-234	7.07E-11	7.07E-11	SLPF( 9,4)
Sf-3	U-235+D	7.18E-11	6.96E-11	SLPF( 10,4)
Sf-3	U-238	6.40E-11	6.40E-11	SLPF( 11,4)
Sf-3	U-238+D	8.71E-11	6.40E-11	SLPF( 12,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	1.16E-09	3.81E-10	SLPF( 1,5)
Sf-3	Pa-231	3.74E-10	3.74E-10	SLPF( 2,5)
Sf-3	Pb-210+D	2.66E-09	1.84E-09	SLPF( 3,5)
Sf-3	Ra-226+D	7.30E-10	7.29E-10	SLPF( 4,5)
Sf-3	Ra-228+D	2.29E-09	2.28E-09	SLPF( 5,5)

Sf-3	Th-228+D	8.09E-10	2.89E-10	SLPF( 6,5)
Sf-3	Th-230	2.02E-10	2.02E-10	SLPF( 7,5)
Sf-3	Th-232	2.31E-10	2.31E-10	SLPF( 8,5)
Sf-3	U-234	1.58E-10	1.58E-10	SLPF( 9,5)
Sf-3	U-235+D	1.63E-10	1.57E-10	SLPF( 10,5)
Sf-3	U-238	1.43E-10	1.43E-10	SLPF( 11,5)
Sf-3	U-238+D	2.10E-10	1.43E-10	SLPF( 12,5)
Sf-Rn	Radon Inhalation slope factors, 1/(pCi):			
Sf-Rn	Rn-222	1.80E-12	1.80E-12	SLPFRN(1,1)
Sf-Rn	Po-218	3.70E-12	3.70E-12	SLPFRN(1,2)
Sf-Rn	Pb-214	6.20E-12	6.20E-12	SLPFRN(1,3)
Sf-Rn	Bi-214	1.50E-11	1.50E-11	SLPFRN(1,4)
Sf-Rn	Rn-220	1.90E-13	1.90E-13	SLPFRN(2,1)
Sf-Rn	Po-216	3.00E-15	3.00E-15	SLPFRN(2,2)
Sf-Rn	Pb-212	3.90E-11	3.90E-11	SLPFRN(2,3)
Sf-Rn	Bi-212	3.70E-11	3.70E-11	SLPFRN(2,4)
Sf-Rn	Radon K factors, (mrem/WLM) :			
Sf-Rn	Rn-222 Indoor	7.60E+02	7.60E+02	KFACTR(1,1)
Sf-Rn	Rn-222 Outdoor	5.70E+02	5.70E+02	KFACTR(1,2)
Sf-Rn	Rn-220 Indoor	1.50E+02	1.50E+02	KFACTR(2,1)
Sf-Rn	Rn-220 Outdoor	2.50E+02	2.50E+02	KFACTR(2,2)

\*Base Case means Default.Lib w/o Associate Nuclide contributions.  
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Intrisk : DT-15 ISOU Resident  
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Po-212	0.000E+00									
Po-214	3.860E-10	4.968E-01								
Po-215	7.480E-10	4.995E-01								
Po-216	7.870E-11	4.994E-01								
Po-218	4.260E-11	4.994E-01								
Ra-223	4.340E-07	5.051E-01								
Ra-224	3.720E-08	5.058E-01								
Ra-226	2.290E-08	5.070E-01								
Ra-228	0.000E+00									
Rn-219	2.250E-07	5.032E-01								
Rn-220	1.700E-09	4.974E-01								
Rn-222	1.740E-09	4.974E-01								
Th-227	3.780E-07	5.062E-01								
Th-228	5.590E-09	5.083E-01								
Th-230	8.190E-10	5.102E-01								
Th-231	2.450E-08	5.108E-01								
Th-232	3.420E-10	5.128E-01								
Th-234	1.630E-08	5.112E-01								
Tl-207	1.520E-08	4.995E-01								
Tl-208	1.760E-05	5.019E-01								
Tl-210	0.000E+00	5.384E-01								
U-234	2.520E-10	5.138E-01								
U-235	5.180E-07	5.069E-01								
U-238	4.990E-11	5.304E-01								

\* - Units are 1/yr per (pCi/g) at infinite depth and area. Multiplication by ETFG(i,t) converts to site conditions.  
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t= 0.000E+00 years

Radio-Nuclide	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total Ingestion*
	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	
Ac-227	8.001E-05	2.961E+00	0.000E+00	0.000E+00	1.609E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.570E+00
Pa-231	6.721E-04	9.946E+01	0.000E+00	0.000E+00	1.352E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.130E+02
Pb-210	4.657E-03	6.891E+02	0.000E+00	0.000E+00	9.367E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.828E+02
Ra-226	3.584E-03	2.122E+03	0.000E+00	0.000E+00	7.210E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.194E+03
Ra-228	1.520E-03	8.999E+02	0.000E+00	0.000E+00	3.058E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.304E+02
Th-228	0.000E+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	0.000E+00	0.000E+00
Th-230	3.664E-03	5.426E+01	0.000E+00	0.000E+00	7.371E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.280E+02
Th-232	1.744E-03	2.583E+01	0.000E+00	0.000E+00	3.509E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.091E+01
U-234	3.472E-03	1.285E+02	0.000E+00	0.000E+00	6.985E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.983E+02
U-235	3.040E-04	1.125E+01	0.000E+00	0.000E+00	6.116E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.737E+01
U-238	3.472E-03	1.285E+02	0.000E+00	0.000E+00	6.985E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.983E+02

\* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil

and water-dependent water, fish, plant, meat, milk pathways

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of Radon and its Decay Products as pCi/yr at t= 0.000E+00 years  
Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependent  
RESRAD, Version 6.5      T<sub>d</sub> Limit = 180 days      11/05/2013 15:12 Page 6  
Intrinsic : DT-15 ISOU Resident  
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 0.000E+00 years												
Water Independent Pathways (Inhalation excludes radon)												
Radio-Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	3.938E-06	0.0062	1.779E-09	0.0000	2.076E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	1.992E-07	0.0003
Pa-231	8.713E-07	0.0014	9.075E-10	0.0000	6.671E-07	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	1.500E-07	0.0002
Pb-210	1.710E-07	0.0003	1.774E-09	0.0000	6.526E-05	0.1033	0.000E+00	0.0000	0.000E+00	0.0000	6.838E-06	0.0108
Ra-226	2.832E-04	0.4482	1.234E-09	0.0000	3.252E-05	0.0515	0.000E+00	0.0000	0.000E+00	0.0000	1.568E-06	0.0025
Ra-228	7.134E-05	0.1129	2.634E-10	0.0000	4.254E-05	0.0673	0.000E+00	0.0000	0.000E+00	0.0000	2.315E-06	0.0037
Th-228	1.110E-04	0.1757	6.504E-09	0.0000	4.379E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	7.417E-07	0.0012
Th-230	2.870E-08	0.0000	3.133E-09	0.0000	1.937E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	4.467E-07	0.0007
Th-232	5.735E-09	0.0000	2.266E-09	0.0000	1.030E-07	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.431E-07	0.0004
U-234	8.339E-09	0.0000	1.175E-09	0.0000	3.642E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	3.276E-07	0.0005
U-235	1.551E-06	0.0025	9.116E-11	0.0000	3.261E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	2.965E-08	0.0000
U-238	3.669E-06	0.0058	9.637E-10	0.0000	4.600E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	4.354E-07	0.0007
Total	4.758E-04	0.7530	2.009E-08	0.0000	1.428E-04	0.2260	0.000E+00	0.0000	0.000E+00	0.0000	1.329E-05	0.0210

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways												
Radio-Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.00CE+00	0.0000	4.346E-06	0.0069
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.00CE+00	0.0000	1.689E-06	0.0027

Pb-210	0.000E+00	0.0000	7.227E-05	0.1144								
Ra-226	0.000E+00	0.0000	3.173E-04	0.5021								
Ra-228	0.000E+00	0.0000	1.162E-04	0.1839								
Th-228	0.000E+00	0.0000	1.122E-04	0.1775								
Th-230	0.000E+00	0.0000	6.722E-07	0.0011								
Th-232	0.000E+00	0.0000	3.542E-07	0.0006								
U-234	0.000E+00	0.0000	7.013E-07	0.0011								
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.00CE+00	0.0000	1.614E-06	0.0026
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.00CE+00	0.0000	4.565E-06	0.0072
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.00CE+00	0.0000	6.319E-04	1.0000

\*\* Sum of water independent ground, inhalation, plant, meat, milk, soil  
and water dependent water, fish, plant, meat, milk pathways

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
Radon and its Decay Products at t= 0.000E+00 years

Radionuclides								
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.00OE+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.00OE+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.00OE+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent    Water-dep. == Water-dependent

0  
0  
Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 0.000E+00 years

Radio-Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	6.985E-07	0.0011	3.155E-10	0.0000	0.000E+00	0.0000	3.654E-08	0.0001	0.00CE+00	0.0000	0.000E+00	0.0000	3.533E-08	0.0001
Pa-231	4.110E-06	0.0065	2.370E-09	0.0000	0.000E+00	0.0000	8.380E-07	0.0013	0.00CE+00	0.0000	0.000E+00	0.0000	3.138E-07	0.0005
Pb-210	1.211E-07	0.0002	1.256E-09	0.0000	0.000E+00	0.0000	4.608E-05	0.0729	0.00CE+00	0.0000	0.000E+00	0.0000	4.842E-06	0.0077
Ra-226	2.814E-04	0.4453	1.742E-09	0.0000	0.000E+00	0.0000	5.139E-05	0.0813	0.00CE+00	0.0000	0.000E+00	0.0000	3.544E-06	0.0056
Ra-228	4.668E-05	0.0739	1.784E-09	0.0000	0.000E+00	0.0000	1.048E-05	0.0166	0.00CE+00	0.0000	0.000E+00	0.0000	7.582E-07	0.0012
Th-230	1.907E-06	0.0030	3.143E-09	0.0000	0.000E+00	0.0000	5.001E-07	0.0008	0.00CE+00	0.0000	0.000E+00	0.0000	4.665E-07	0.0007
Th-232	1.357E-04	0.2147	7.249E-09	0.0000	0.000E+00	0.0000	3.260E-05	0.0516	0.00CE+00	0.0000	0.000E+00	0.0000	2.542E-06	0.0040
U-234	8.502E-09	0.0000	1.175E-09	0.0000	0.000E+00	0.0000	3.643E-07	0.0006	0.00CE+00	0.0000	0.000E+00	0.0000	3.276E-07	0.0005
U-235	1.552E-06	0.0025	9.144E-11	0.0000	0.000E+00	0.0000	3.272E-08	0.0001	0.00CE+00	0.0000	0.000E+00	0.0000	2.969E-08	0.0000
U-238	3.669E-06	0.0058	9.638E-10	0.0000	0.000E+00	0.0000	4.600E-07	0.0007	0.00CE+00	0.0000	0.000E+00	0.0000	4.354E-07	0.0007
Total	4.758E-04	0.7530	2.009E-08	0.0000	0.000E+00	0.0000	1.428E-04	0.2260	0.00CE+00	0.0000	0.000E+00	0.0000	1.329E-05	0.0210

RESRAD, Version 6.5      The Limit = 180 days

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Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 0.000E+00 years

## Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Radio-Nuclide	risk	fract.	risk	fract.										
Ac-227	0.0000E+00	0.0000	7.7070E-07	0.0012										
Pa-231	0.0000E+00	0.0000	5.2650E-06	0.0083										
Pb-210	0.0000E+00	0.0000	5.1050E-05	0.0808										
Ra-226	0.0000E+00	0.0000	3.3630E-04	0.5322										
Ra-228	0.0000E+00	0.0000	5.7920E-05	0.0917										
Th-230	0.0000E+00	0.0000	2.8760E-06	0.0046										
Th-232	0.0000E+00	0.0000	1.7080E-04	0.2703										
U-234	0.0000E+00	0.0000	7.0150E-07	0.0011										
U-235	0.0000E+00	0.0000	1.6140E-06	0.0026										
U-238	0.0000E+00	0.0000	4.5650E-06	0.0072										
Total	0.0000E+00	0.0000	6.3190E-04	1.0000										

\*\*\*CNRSI(i,p,t) includes contribution from decay daughter radionuclides

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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t = 1.000E+00 years

\* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil  
and water-dependent water, fish, plant, meat, milk pathways

0 Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of  
Radon and its Decay Products as pCi/yr at t= 1.00CE+00 years

Radionuclides								
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Pc-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependent  
RESRAD, Version 6.5      T½ Limit = 180 days      11/05/2013 15:12 Page 10  
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.00CE+00 years

Radio-Nuclide	Water Independent Pathways (Inhalation excludes radon)											
	Ground		Inhalation		Plant		Meat		Milk		Soil	
risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	
Ac-227	4.096E-06	0.0064	1.850E-09	0.0000	2.159E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	2.072E-07	0.0003
Pa-231	8.707E-07	0.0014	9.068E-10	0.0000	6.666E-07	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	1.499E-07	0.0002
Pb-210	1.701E-07	0.0003	1.764E-09	0.0000	6.491E-05	0.1021	0.000E+00	0.0000	0.000E+00	0.0000	6.801E-06	0.0107
Ra-226	2.831E-04	0.4454	1.234E-09	0.0000	3.250E-05	0.0511	0.000E+00	0.0000	0.000E+00	0.0000	1.567E-06	0.0025
Ra-228	7.163E-05	0.1127	2.644E-10	0.0000	4.270E-05	0.0672	0.000E+00	0.0000	0.000E+00	0.0000	2.325E-06	0.0037
Th-228	1.146E-04	0.1803	6.715E-09	0.0000	4.485E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	7.658E-07	0.0012
Th-230	2.870E-08	0.0000	3.133E-09	0.0000	1.937E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	4.467E-07	0.0007
Th-232	5.735E-09	0.0000	2.266E-09	0.0000	1.030E-07	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.431E-07	0.0004
U-234	8.333E-09	0.0000	1.174E-09	0.0000	3.640E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	3.273E-07	0.0005
U-235	1.550E-06	0.0024	9.109E-11	0.0000	3.258E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	2.963E-08	0.0000
U-238	3.666E-06	0.0058	9.630E-10	0.0000	4.597E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	4.351E-07	0.0007
Total	4.797E-04	0.7547	2.036E-08	0.0000	1.426E-04	0.2243	0.000E+00	0.0000	0.000E+00	0.0000	1.330E-05	0.0209

0 Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.00CE+00 years

#### Water Dependent Pathways

Radio-Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Ac-227	0.000E+00	0.0000	4.521E-06	0.0071								

Pa-231	0.000E+00	0.0000	1.688E-06	0.0027								
Pb-210	0.000E+00	0.0000	7.188E-05	0.1131								
Ra-226	0.000E+00	0.0000	3.171E-04	0.4990								
Ra-228	0.000E+00	0.0000	1.167E-04	0.1835								
Th-228	0.000E+00	0.0000	1.158E-04	0.1822								
Th-230	0.000E+00	0.0000	6.722E-07	0.0011								
Th-232	0.000E+00	0.0000	3.542E-07	0.0006								
U-234	0.000E+00	0.0000	7.008E-07	0.0011								
U-235	0.000E+00	0.0000	1.612E-06	0.0025								
U-238	0.000E+00	0.0000	4.562E-06	0.0072								
Total	0.000E+00	0.0000	6.356E-04	1.0000								

\*\* Sum of water independent ground, inhalation, plant, meat, milk, soil  
and water dependent water, fish, plant, meat, milk pathways

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
Radon and its Decay Products at t= 1.000E+00 years

Radionuclides								
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Fo-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.030E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.030E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00							

Water-ind. == Water-independent    Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)												
Radio-Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	6.754E-07	0.0011	3.051E-10	0.0000	0.000E+00	0.0000	3.533E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	4.291E-06	0.0068	2.452E-09	0.0000	0.000E+00	0.0000	8.470E-07	0.0013	0.000E+00	0.0000	0.000E+00	0.0000
Pb-210	1.173E-07	0.0002	1.217E-09	0.0000	0.000E+00	0.0000	4.466E-05	0.0703	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	2.811E-04	0.4423	1.769E-09	0.0000	0.000E+00	0.0000	5.243E-05	0.0825	0.000E+00	0.0000	0.000E+00	0.0000
Ra-228	4.426E-05	0.0696	1.751E-09	0.0000	0.000E+00	0.0000	9.295E-06	0.0146	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	2.031E-06	0.0032	3.144E-09	0.0000	0.000E+00	0.0000	5.231E-07	0.0008	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	1.420E-04	0.2234	7.494E-09	0.0000	0.000E+00	0.0000	3.396E-05	0.0534	0.000E+00	0.0000	0.000E+00	0.0000
U-234	8.512E-09	0.0000	1.174E-09	0.0000	0.000E+00	0.0000	3.640E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000
U-235	1.551E-06	0.0024	9.139E-11	0.0000	0.000E+00	0.000C	3.270E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000
U-238	3.666E-06	0.0058	9.631E-10	0.0000	0.000E+00	0.000C	4.597E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000

Total 4.797E-04 0.7547 2.036E-08 0.0000 0.000E+00 0.0000 1.426E-04 0.2243 0.000E+00 0.0000 0.000E+00 0.0000 1.330E-05 0.0209  
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Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t = 1.000E+00 years

## Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Radio-Nuclide	risk	fract.	risk	fract.										
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.452E-07	0.0012
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.463E-06	0.0086
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.947E-05	0.0778
Ra-226	0.000E+00	0.0000	3.372E-04	0.5305										
Ra-228	0.000E+00	0.0000	5.424E-05	0.0853										
Th-230	0.000E+00	0.0000	3.025E-06	0.0048										
Th-232	0.000E+00	0.0000	1.786E-04	0.2810										
U-234	0.000E+00	0.0000	7.011E-07	0.0011										
U-235	0.000E+00	0.0000	1.613E-06	0.0025										
U-238	0.000E+00	0.0000	4.562E-06	0.0072										
Total	0.000E+00	0.0000	6.356E-04	1.0000										

\*\*\*CNRSI(i,p,t) includes contribution from decay daughter radionuclides  
RESRAD, Version 6.5 T<sub>1/2</sub> Limit = 180 days 11/05/2013 15:12 Page 13  
Intrinsic : DT-15 ISOU Resident  
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t = 3.000E+00 years

\* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil and water-dependent water, fish, plant, meat, milk pathways

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,-) for Inhalation of Radon and its Decay Products as pCi/yr at t= 3.000E+00 years  
Radionuclides

Water-ind. == Water-independent      Water-dep. == Water-dependent  
RESRAD, Version 6.5      T<sub>1/2</sub> Limit = 180 days      11/05/2013 15:12 Page 14  
Intrinsic : DT-15 ISOU Resident  
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+00 years

Radio-Nuclide	Water Independent Pathways (Inhalation excludes radon)											
	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	4.396E-06	0.0069	1.986E-09	0.0000	2.316E-07	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	2.223E-07	0.0003
Pa-231	8.695E-07	0.0014	9.055E-10	0.0000	6.656E-07	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	1.497E-07	0.0002
Pb-210	1.683E-07	0.0003	1.746E-09	0.0000	6.423E-05	0.1003	0.000E+00	0.0000	0.000E+00	0.0000	6.731E-06	0.0105
Ra-226	2.828E-04	0.4417	1.233E-09	0.0000	3.247E-05	0.0507	0.000E+00	0.0000	0.000E+00	0.0000	1.566E-06	0.0024
Ra-228	7.210E-05	0.1126	2.661E-10	0.0000	4.299E-05	0.0671	0.000E+00	0.0000	0.000E+00	0.0000	2.340E-06	0.0037
Th-228	1.192E-04	0.1862	6.985E-09	0.0000	4.614E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	7.967E-07	0.0012
Th-230	2.870E-08	0.0000	3.133E-09	0.0000	1.937E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	4.467E-07	0.0007
Th-232	5.735E-09	0.0000	2.266E-09	0.0000	1.030E-07	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.431E-07	0.0004
U-234	8.321E-09	0.0000	1.172E-09	0.0000	3.634E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	3.269E-07	0.0005
U-235	1.548E-06	0.0024	9.096E-11	0.0000	3.254E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	2.959E-08	0.0000
U-238	3.661E-06	0.0057	9.617E-10	0.0000	4.590E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	4.345E-07	0.0007
Total	4.848E-04	0.7571	2.074E-08	0.0000	1.422E-04	0.2221	0.000E+00	0.0000	0.000E+00	0.0000	1.329E-05	0.0207

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
 and Fraction of Total Risk at t= 3.000E+00 years

## Water Dependent Pathways

Ac-227	0.000E+00	0.0000	4.852E-06	0.0076								
Pa-231	0.000E+00	0.0000	1.686E-06	0.0026								
Pb-210	0.000E+00	0.0000	7.113E-05	0.1111								
Ra-226	0.000E+00	0.0000	3.168E-04	0.4948								
Ra-228	0.000E+00	0.0000	1.174E-04	0.1834								
Th-228	0.000E+00	0.0000	1.205E-04	0.1882								
Th-230	0.000E+00	0.0000	6.722E-07	0.0010								
Th-232	0.000E+00	0.0000	3.542E-07	0.0006								
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.030E+00	0.0000	6.998E-07	0.0011
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.030E+00	0.0000	1.610E-06	0.0025
U-238	0.000E+00	0.0000	4.556E-06	0.0071								
Total	0.000E+00	0.0000	6.403E-04	1.0000								

\*\* Sum of water independent ground, inhalation, plant, meat, milk, soil  
and water dependent water, fish, plant, meat, milk pathways

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Intrinsic : DT-15 ISOU Resident

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
Radon and its Decay Products at t= 3.000E+00 years

Radionuclides								
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rr-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.00CE+00	0.000E+00
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent Water-dep. == Water-dependent

0 Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)														
Radio-Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk			
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.		
Ac-227	6.315E-07	0.0010	2.852E-10	0.0000	0.000E+00	0.0000	3.303E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	3.194E-08	0.0000
Pa-231	4.634E-06	0.0072	2.606E-09	0.0000	0.000E+00	0.0000	8.640E-07	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	3.401E-07	0.0005
Pb-210	1.102E-07	0.0002	1.143E-09	0.0000	0.000E+00	0.0000	4.193E-05	0.0655	0.000E+00	0.0000	0.000E+00	0.0000	4.406E-06	0.0069
Ra-226	2.806E-04	0.4382	1.823E-09	0.0000	0.000E+00	0.0000	5.440E-05	0.0850	0.000E+00	0.0000	0.000E+00	0.0000	3.865E-06	0.0060
Ra-228	3.795E-05	0.0593	1.562E-09	0.0000	0.000E+00	0.0000	7.304E-06	0.0114	0.000E+00	0.0000	0.000E+00	0.0000	5.640E-07	0.0009
Th-230	2.280E-06	0.0036	3.146E-09	0.0000	0.000E+00	0.0000	5.704E-07	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	4.714E-07	0.0007
Th-232	1.534E-04	0.2395	7.955E-09	0.0000	0.000E+00	0.0000	3.625E-05	0.0566	0.000E+00	0.0000	0.000E+00	0.0000	2.816E-06	0.0044
U-234	8.537E-09	0.0000	1.173E-09	0.0000	0.000E+00	0.0000	3.635E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	3.269E-07	0.0005
U-235	1.548E-06	0.0024	9.131E-11	0.0000	0.000E+00	0.0000	3.267E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	2.964E-08	0.0000
U-238	3.661E-06	0.0057	9.617E-10	0.0000	0.000E+00	0.0000	4.590E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	4.345E-07	0.0007

Total 4.848E-04 0.7571 2.074E-08 0.0000 0.000E+00 0.0000 1.422E-04 0.2221 0.000E+00 0.0000 0.000E+00 0.0000 1.329E-05 0.0207  
RESRAD, Version 6.5 T<sub>1/2</sub> Limit = 180 days 11/05/2013 15:12 Page 16  
Inrisk : DT-15 ISOU Resident  
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Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+00 years

## Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Radio-Nuclide	risk	fract.	risk	fract..										
Ac-227	0.000E+00	0.0000	6.968E-07	0.0011										
Pa-231	0.000E+00	0.0000	5.840E-06	0.0091										
Pb-210	0.000E+00	0.0000	4.645E-05	0.0725										
Ra-226	0.000E+00	0.0000	3.389E-04	0.5292										
Ra-228	0.000E+00	0.0000	4.582E-05	0.0716										
Th-230	0.000E+00	0.0000	3.325E-06	0.0052										
Th-232	0.000E+00	0.0000	1.924E-04	0.3006										
U-234	0.000E+00	0.0000	7.001E-07	0.0011										
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+C0	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.611E-06	0.0025
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+C0	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.556E-06	0.0071
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+C0	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.403E-04	1.0000

\*\*\*CNRSI(i,p,t) includes contribution from decay daughter radionuclides  
RESRAD, Version 6.5 T<sub>1/2</sub> Limit = 180 days 11/05/2013 15:12 Page 17  
Intrinsic : DT-15 ISOU Resident  
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t = 1.000E+01 years

U-238 3.448E-03 1.276E+02 0.000E+00 0.000E+00 6.935E+01 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 1.969E+02

\* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil and water-dependent water, fish, plant, meat, milk pathways

1

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of Radon and its Decay Products as pCi/yr at t= 1.000E+01 years

0

Water-ind. == Water-independent      Water-dep. == Water-dependent  
ESRAD, Version 6.5      T½ Limit = 180 days      11/05/2013 15:12 Page 18  
Intrisk : DT-15 ISOU Resident  
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p  
and Fraction of Total Risk at t= 1.000E+01 years

Radio-Nuclide	risk	fract.										
Ac-227	5.295E-06	0.0082	2.392E-09	0.0000	2.786E-07	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	2.678E-07	0.0004
Pa-231	8.650E-07	0.0013	9.009E-10	0.0000	6.622E-07	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	1.490E-07	0.0002
Pb-210	1.629E-07	0.0003	1.689E-09	0.0000	6.216E-05	0.0964	0.000E+00	0.0000	0.003E+00	0.0000	6.513E-06	0.0101
Ra-226	2.818E-04	0.4369	1.228E-09	0.0000	3.236E-05	0.0502	0.000E+00	0.0000	0.000E+00	0.0000	1.560E-06	0.0024
Ra-228	7.308E-05	0.1133	2.698E-10	0.0000	4.357E-05	0.0676	0.000E+00	0.0000	0.000E+00	0.0000	2.372E-06	0.0037
Th-228	1.247E-04	0.1933	7.306E-09	0.0000	4.776E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	8.333E-07	0.0013
Th-230	2.870E-08	0.0000	3.133E-09	0.0000	1.937E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	4.467E-07	0.0007
Th-232	5.735E-09	0.0000	2.266E-09	0.0000	1.030E-07	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.431E-07	0.0004
U-234	8.279E-09	0.0000	1.167E-09	0.0000	3.616E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	3.252E-07	0.0005
U-235	1.540E-06	0.0024	9.051E-11	0.0000	3.237E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	2.944E-08	0.0000
U-238	3.643E-06	0.0056	9.569E-10	0.0000	4.567E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	4.323E-07	0.0007
Total	4.911E-04	0.7615	2.140E-08	0.0000	1.407E-04	0.2181	0.000E+00	0.0000	0.000E+00	0.0000	1.317E-05	0.0204

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+01 years

## Water Dependent Pathways

Ac-227	0.000E+00	0.0000	5.844E-06	0.0091								
Pa-231	0.000E+00	0.0000	1.677E-06	0.0026								
Pb-210	0.000E+00	0.0000	6.884E-05	0.1067								
Ra-226	0.000E+00	0.0000	3.157E-04	0.4895								
Ra-228	0.000E+00	0.0000	1.190E-04	0.1845								
Th-228	0.000E+00	0.0000	1.260E-04	0.1954								
Th-230	0.000E+00	0.0000	6.722E-07	0.0010								
Th-232	0.000E+00	0.0000	3.542E-07	0.0005								
U-234	0.000E+00	0.0000	6.963E-07	0.0011								
U-235	0.000E+00	0.0000	1.602E-06	0.0025								
U-238	0.000E+00	0.0000	4.533E-06	0.0070								
Total	0.000E+00	0.0000	6.450E-04	1.0000								

\*\* Sum of water independent ground, inhalation, plant, meat, milk, soil  
and water dependent water, fish, plant, meat, milk pathways

RESRAD, Version 6.5      T<sub>1/2</sub> Limit = 180 days      11/05/2013 15:12 Page 19  
Intrinsic : DT-15 ISOU Resident  
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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
Radon and its Decay Products at t= 1.000E+01 years

Radionuclides								
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.090E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.030E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent      Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+01 years  
Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Sci	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	4.991E-07	0.0008	2.254E-10	0.0000	0.000E+00	0.0000	2.611E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.524E-08	0.0000
Pa-231	5.660E-06	0.0088	3.067E-09	0.0000	0.000E+00	0.0000	9.145E-07	0.0014	0.000E+00	0.0000	0.000E+00	0.0000	3.915E-07	0.0006
Pb-210	8.840E-08	0.0001	9.171E-10	0.0000	0.000E+00	0.0000	3.365E-05	0.0522	0.000E+00	0.0000	0.000E+00	0.0000	3.536E-06	0.0055
Ra-226	2.788E-04	0.4322	1.982E-09	0.0000	0.000E+00	0.0000	6.032E-05	0.0935	0.000E+00	0.0000	0.000E+00	0.0000	4.500E-06	0.0070
Ra-228	1.807E-05	0.0280	7.753E-10	0.0000	0.000E+00	0.0000	3.135E-06	0.0049	0.000E+00	0.0000	0.000E+00	0.0000	2.538E-07	0.0004
Th-230	3.147E-06	0.0049	3.151E-09	0.0000	0.000E+00	0.0000	7.485E-07	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	4.844E-07	0.0008
Th-232	1.797E-04	0.2786	9.066E-09	0.0000	0.000E+00	0.0000	4.102E-05	0.0636	0.000E+00	0.0000	0.000E+00	0.0000	3.194E-06	0.0050
U-234	8.656E-09	0.0000	1.167E-09	0.0000	0.000E+00	0.0000	3.617E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	3.253E-07	0.0005
U-235	1.541E-06	0.0024	9.105E-11	0.0000	0.000E+00	0.0000	3.257E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	2.951E-08	0.0000

U-238 3.643E-06 0.0056 9.569E-10 0.0000 0.000E+00 0.0000 4.567E-07 0.0007 0.000E+00 0.0000 0.000E+00 0.0000 4.323E-07 0.0007  
 Total 4.911E-04 0.7615 2.140E-08 0.0000 0.000E+00 0.0000 1.407E-04 0.2181 0.000E+00 0.0000 0.000E+00 0.0000 1.317E-05 0.0204  
 RESRAD, Version 6.5 T<sub>½</sub> Limit = 180 days 11/05/2013 15:12 Page 20  
 Intrisk : DT-15 ISOU Resident  
 File : C:\RESRAD FAMILY\RESRAD\6.5\USERFILES\DT15\_ISOU.RES.RAD

Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+01 years

## Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Radio-Nuclide	risk	fract.	risk	fract.										
Ac-227	0.000E+00	0.0000	5.507E-07	0.0009										
Pa-231	0.000E+00	0.0000	6.970E-06	0.0108										
Pb-210	0.000E+00	0.0000	3.727E-05	0.0578										
Ra-226	0.000E+00	0.0000	3.436E-04	0.5327										
Ra-228	0.000E+00	0.0000	2.146E-05	0.0333										
Th-230	0.000E+00	0.0000	4.383E-06	0.0068										
Th-232	0.000E+00	0.0000	2.239E-04	0.3472										
U-234	0.000E+00	0.0000	6.968E-07	0.0011										
U-235	0.000E+00	0.0000	1.603E-06	0.0025										
U-238	0.000E+00	0.0000	4.533E-06	0.0070										
Total	0.000E+00	0.0000	6.450E-04	1.0000										

\*\*\*CNRSI(i,p,t) includes contribution from decay daughter radionuclides  
RESRAD, Version 6.5 T<sub>1/2</sub> Limit = 180 days 11/05/2013 15:12 Page 21  
Intrinsic : DT-15 ISOU Resident  
File : C:\RESRAD FAMILY\RESRAD\6.5\USERFILES\DT15\_ISOU.RES.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t = 3.000E+01 years

U-235	2.976E-04	1.101E+01	0.000E+00	0.000E+00	5.986E+00	0.000E+00	1.700E+01						
U-238	3.399E-03	1.258E+02	0.000E+00	0.000E+00	6.837E+01	0.000E+00	1.941E+02						

\* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil  
and water-dependent water, fish, plant, meat, milk pathways

0  
Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of  
Radon and its Decay Products as pCi/yr at t= 3.000E+01 years  
0 Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependent  
RESRAD, Version 6.5      T<sub>1/2</sub> Limit = 180 days      11/05/2013 15:12 Page 22  
Intrinsic : DT-15 ISOU Resident  
File : C:\RESRAD\_FAMILY\RESRAD\6.5\USERFILES\DT15 ISOU RES.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 3.000E+01 years												
Water Independent Pathways (Inhalation excludes radon)												
Radio-Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	6.910E-06	0.0108	3.121E-09	0.0000	3.630E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	3.495E-07	0.0005
Pa-231	8.526E-07	0.0013	8.879E-10	0.0000	6.527E-07	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	1.468E-07	0.0002
Pb-210	1.521E-07	0.0002	1.578E-09	0.0000	5.806E-05	0.0904	0.000E+00	0.0000	0.000E+00	0.0000	6.082E-06	0.0095
Ra-226	2.790E-04	0.4346	1.216E-09	0.0000	3.204E-05	0.0499	0.000E+00	0.0000	0.000E+00	0.0000	1.545E-06	0.0024
Ra-228	7.375E-05	0.1149	2.722E-10	0.0000	4.397E-05	0.0685	0.000E+00	0.0000	0.000E+00	0.0000	2.393E-06	0.0037
Th-228	1.267E-04	0.1973	7.423E-09	0.0000	4.841E-07	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	8.466E-07	0.0013
Th-230	2.870E-08	0.0000	3.133E-09	0.0000	1.937E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	4.467E-07	0.0007
Th-232	5.735E-09	0.0000	2.266E-09	0.0000	1.030E-07	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.431E-07	0.0004
U-234	8.162E-09	0.0000	1.150E-09	0.0000	3.565E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	3.206E-07	0.0005
U-235	1.518E-06	0.0024	8.922E-11	0.0000	3.191E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.902E-08	0.0000
U-238	3.591E-06	0.0056	9.433E-10	0.0000	4.502E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	4.262E-07	0.0007
Total	4.925E-04	0.7671	2.208E-08	0.0000	1.367E-04	0.2129	0.000E+00	0.0000	0.000E+00	0.0000	1.283E-05	0.C200

0  
Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways					
Radio-	Water	Fish	Plant	Meat	Milk
					All Pathways**

Nuclide	risk	fract.		
Ac-227	0.000E+00	0.0000	7.626E-06	0.0119
Pa-231	0.000E+00	0.0000	1.653E-06	0.0026
Pb-210	0.000E+00	0.0000	6.430E-05	0.1001
Ra-226	0.000E+00	0.0000	3.126E-04	0.4869
Ra-228	0.000E+00	0.0000	1.201E-04	0.1871
Th-228	0.000E+00	0.0000	1.280E-04	0.1994
Th-230	0.000E+00	0.0000	6.722E-07	0.0010
Th-232	0.000E+00	0.0000	3.542E-07	0.0006
U-234	0.000E+00	0.0000	6.864E-07	0.0011
U-235	0.000E+00	0.0000	1.579E-06	0.0025
U-238	0.000E+00	0.0000	4.468E-06	0.0070
Total	0.000E+00	0.0000	6.421E-04	1.0000

\*\* Sum of water independent ground, inhalation, plant, meat, milk, soil  
and water dependent water, fish, plant, meat, milk pathways

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Intrinsic : DT-15 ISOU Resident  
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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
Radon and its Decay Products at t= 3.000E+01 years  
Radionuclides

0	Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+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
Water-dep.	0.000E+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
Total	0.000E+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

Water-ind. == Water-independent      Water-dep. == Water-dependent

0      Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+01 years

0	Water Independent Pathways (Inhalation excludes radon)													
0	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.549E-07	0.0004	1.151E-10	0.0000	0.000E+00	0.0000	1.333E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.289E-08	0.0000
Pa-231	7.506E-06	0.0117	3.893E-09	0.0000	0.000E+00	0.0000	1.002E-06	0.0016	0.000E+00	0.0000	0.000E+00	0.0000	4.832E-07	0.0008
Pb-210	4.714E-08	0.0001	4.890E-10	0.0000	0.000E+00	0.0000	1.794E-05	0.0279	0.000E+00	0.0000	0.000E+00	0.0000	1.885E-06	0.0029
Ra-226	2.736E-04	0.4261	2.267E-09	0.0000	0.000E+00	0.0000	7.102E-05	0.1106	0.000E+00	0.0000	0.000E+00	0.0000	5.659E-06	0.0088
Ra-228	1.642E-06	0.0026	7.101E-11	0.0000	0.000E+00	0.0000	2.786E-07	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	2.279E-08	0.0000
Th-230	5.592E-06	0.0087	3.170E-09	0.0000	0.000E+00	0.0000	1.336E-06	0.0021	0.000E+00	0.0000	0.000E+00	0.0000	5.299E-07	0.0008
Th-232	1.988E-04	0.3096	9.889E-09	0.0000	0.000E+00	0.0000	4.428E-05	0.0690	0.000E+00	0.0000	0.000E+00	0.0000	3.460E-06	0.0054
U-234	9.274E-09	0.0000	1.151E-09	0.0000	0.000E+00	0.0000	3.567E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	3.208E-07	0.0005

U-235	1.520E-06	0.0024	9.043E-11	0.0000	0.000E+00	0.0000	3.229E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	2.918E-08	0.00000
U-238	3.591E-06	0.0056	9.434E-10	0.0000	0.000E+00	0.0000	4.503E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	4.262E-07	0.0007

Total 4.925E-04 0.7671 2.208E-08 0.0000 0.000E+00 0.0000 1.367E-04 0.2129 0.0C0E+00 0.0000 0.000E+00 0.0000 1.283E-05 0.0200

RESRAD, Version 6.5       $\text{Th}$  Limit = 180 days

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Intrisk : DT-15 ISOU Resident

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Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Racionuclides (i) and Pathways (p  
and Fraction of Total Risk at t = 3.000E+01 years

## Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Radio-Nuclide	risk	fract.	risk	fract.										
Ac-227	0.000E+00	0.0000	2.812E-07	0.0004										
Pa-231	0.000E+00	0.0000	8.995E-06	0.0140										
Pb-210	0.000E+00	0.0000	1.988E-05	0.0310										
Ra-226	0.000E+00	0.0000	3.503E-04	0.5455										
Ra-228	0.000E+00	0.0000	1.943E-06	0.0030										
Th-230	0.000E+00	0.0000	7.461E-06	0.0116										
Th-232	0.000E+00	0.0000	2.465E-04	0.3840										
U-234	0.000E+00	0.0000	6.879E-07	0.0011										
U-235	0.000E+00	0.0000	1.582E-06	0.0025										
U-238	0.000E+00	0.0000	4.469E-06	0.0070										
Total	0.000E+00	0.0000	6.421E-04	1.0000										

\*\*\*CNRSI(i,p,t) includes contribution from decay daughter radionuclides  
RESRAD, Version 6.5      T<sub>1/2</sub> Limit = 180 days      11/05/2013 15:12 Page 25  
Intrinsic : DT-15 ISOU Resident  
File : C:\RESRAD\_FAMILY\RESRAD\6.5\USERFILES\DT15\_ISOU.RES.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t = 1.000E+02 years

U-234	3.233E-03	1.196E+02	0.000E+00	0.000E+00	6.503E+01	0.000E+00	1.847E+02						
U-235	2.831E-04	1.047E+01	0.000E+00	0.000E+00	5.694E+00	0.000E+00	1.617E+01						
U-238	3.233E-03	1.196E+02	0.000E+00	0.000E+00	6.503E+01	0.000E+00	1.847E+02						

\* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil  
and water-dependent water, fish, plant, meat, milk pathways

0  
Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of  
Radon and its Decay Products as pCi/yr at t = 1.000E+02 years  
0 Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependent  
RESRAD, Version 6.5      TM Limit = 180 days      11/05/2013 15:12 Page 26  
Inrisk : DT-15 ISOU Resident  
File : C:\RESRAD\_FAMILY\RESRAD\6.5\USERFILES\DT15 ISOU RES.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t = 1.000E+02 years												
Water Independent Pathways (Inhalation excludes radon)												
Radio-Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	8.122E-06	0.0130	3.669E-09	0.0000	4.264E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	4.108E-07	0.0007
Pa-231	8.103E-07	0.0013	8.439E-10	0.0000	6.203E-07	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	1.395E-07	0.0002
Pb-210	1.378E-07	0.0002	1.430E-09	0.0000	5.262E-05	0.0839	0.000E+00	0.0000	0.000E+00	0.0000	5.512E-06	0.0088
Ra-226	2.697E-04	0.4303	1.176E-09	0.0000	3.097E-05	0.0494	0.000E+00	0.0000	0.000E+00	0.0000	1.493E-06	0.0024
Ra-228	7.381E-05	0.1177	2.725E-10	0.0000	4.401E-05	0.0702	0.000E+00	0.0000	0.000E+00	0.0000	2.395E-06	0.0038
Th-228	1.268E-04	0.2024	7.432E-09	0.0000	4.847E-07	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	8.476E-07	0.0014
Th-230	2.870E-08	0.0000	3.133E-09	0.0000	1.937E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	4.466E-07	0.0007
Th-232	5.735E-09	0.0000	2.266E-09	0.0000	1.030E-07	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.431E-07	0.0004
U-234	7.764E-09	0.0000	1.094E-09	0.0000	3.391E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	3.050E-07	0.0005
U-235	1.444E-06	0.0023	8.487E-11	0.0000	3.036E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.761E-08	0.0000
U-238	3.416E-06	0.0054	8.972E-10	0.0000	4.283E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	4.054E-07	0.0006
Total	4.844E-04	0.7727	2.230E-08	0.0000	1.302E-04	0.2078	0.000E+00	0.0000	0.000E+00	0.0000	1.223E-05	0.0195

0  
Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t = 1.000E+02 years

#### Water Dependent Pathways

Water	Fish	Plant	Meat	Milk	All Pathways**
-------	------	-------	------	------	----------------

Radio-Nuclide	risk	fract.										
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+03	0.0000	0.000E+00	0.0000	8.963E-06	0.0143
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+03	0.0000	0.000E+00	0.0000	1.571E-06	0.0025
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+03	0.0000	0.000E+00	0.0000	5.828E-05	0.0930
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+03	0.0000	0.000E+00	0.0000	3.022E-04	0.4821
Ra-228	0.000E+00	0.0000	1.202E-04	0.1918								
Th-228	0.000E+00	0.0000	1.282E-04	0.2045								
Th-230	0.000E+00	0.0000	6.721E-07	0.0011								
Th-232	0.000E+00	0.0000	3.542E-07	0.0006								
U-234	0.000E+00	0.0000	6.529E-07	0.0010								
U-235	0.000E+00	0.0000	1.502E-06	0.0024								
U-238	0.000E+00	0.0000	4.250E-06	0.0068								
Total	0.000E+00	0.0000	6.269E-04	1.0000								

\*\* Sum of water independent ground, inhalation, plant, meat, milk, soil  
and water dependent water, fish, plant, meat, milk pathways

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Intrisk : DT-15 ISOU Resident  
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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
Radon and its Decay Products at t= 1.000E+02 years

Radionuclides								
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent    Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)														
Ground		Inhalation		Radon		Plant		Meat		Milk		Soil		
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.425E-08	0.0000	1.095E-11	0.0000	0.000E+00	0.0000	1.268E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.226E-09	0.0000
Pa-231	8.901E-06	0.0142	4.498E-09	0.0000	0.000E+00	0.0000	1.044E-06	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	5.486E-07	0.0009
Pb-210	5.218E-09	0.0000	5.414E-11	0.0000	0.000E+00	0.0000	1.986E-06	0.0032	0.000E+00	0.0000	0.000E+00	0.0000	2.087E-07	0.0003
Ra-226	2.561E-04	0.4086	2.439E-09	0.0000	0.000E+00	0.0000	7.809E-05	0.1246	0.000E+00	0.0000	0.000E+00	0.0000	6.517E-06	0.0104
Ra-228	3.428E-10	0.0000	1.483E-14	0.0000	0.000E+00	0.0000	5.817E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.758E-12	0.0000
Th-230	1.379E-05	0.0220	3.242E-09	0.0000	0.000E+00	0.0000	3.711E-06	0.0059	0.000E+00	0.0000	0.000E+00	0.0000	7.250E-07	0.0012
Th-232	2.007E-04	0.3201	9.970E-09	0.0000	0.000E+00	0.0000	4.460E-05	0.0711	0.000E+00	0.0000	0.000E+00	0.0000	3.486E-06	0.0056

U-234	1.451E-08	0.0000	1.097E-09	0.0000	0.000E+00	0.0000	3.407E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	3.054E-07	0.0005
U-235	1.452E-06	0.0023	8.886E-11	0.0000	0.000E+00	0.0000	3.139E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	2.810E-08	0.0000
U-238	3.416E-06	0.0054	8.976E-10	0.0000	0.000E+00	0.0000	4.284E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	4.055E-07	0.0006

Total 4.844E-04 0.7727 2.230E-08 0.0000 0.000E+00 0.0000 1.302E-04 0.2078 0.000E+00 0.0000 0.000E+00 0.0000 1.223E-05 0.0195  
 RECBAP Version 6.5 The Limit = 180 days 11/05/2013 15:12 Page 28

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Intrinsic : BT-15 ISOU Resident

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Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t = 1.000E+02 years

## Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Radio-Nuclide	risk	fract.	risk	fract.										
Ac-227	0.000E+00	0.0000	2.675E-08	0.0000										
Pa-231	0.000E+00	0.0000	1.050E-05	0.0167										
Pb-210	0.000E+00	0.0000	2.200E-06	0.0035										
Ra-226	0.000E+00	0.0000	3.407E-04	0.5435										
Ra-228	0.000E+00	0.0000	4.058E-10	0.0000										
Th-230	0.000E+00	0.0000	1.823E-05	0.0291										
Th-232	0.000E+00	0.0000	2.488E-04	0.3968										
U-234	0.000E+00	0.0000	6.617E-07	0.0011										
U-235	0.000E+00	0.0000	1.511E-06	0.0024										
U-238	0.000E+00	0.0000	4.251E-06	0.0068										
Total	0.000E+00	0.0000	6.269E-04	1.0000										

\*\*\*CNRSI(i,p,t) includes contribution from decay daughter radionuclides  
RESRAD, Version 6.5 T<sub>1/2</sub> Limit = 180 days 11/05/2013 15:12 Page 29  
Intrinsic : DT-15 ISOU Resident  
File : C:\RESRAD FAMILY\RESRAD\6.5\USERFILES\DT15\_ISOU.RES.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t = 3.000E+02 years

Th-232	1.744E-03	2.582E+01	0.000E+00	0.000E+00	3.508E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.090E+01
U-234	2.802E-03	1.037E+02	0.000E+00	0.000E+00	5.637E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.601E+02
U-235	2.454E-04	9.080E+00	0.000E+00	0.000E+00	4.936E-00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.402E+01
U-238	2.802E-03	1.037E+02	0.000E+00	0.000E+00	5.637E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.601E+02

\* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil  
and water-dependent water, fish, plant, meat, milk pathways

0  
Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of  
Radon and its Decay Products as pCi/yr at t= 3.000E+02 years

Radionuclides								
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependent  
RESRAD, Version 6.5      T½ Limit = 180 days      11/05/2013 15:12 Page 30  
Intrinsic : DT-15 ISOU Resident  
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 3.000E+02 years												
Water Independent Pathways (Inhalation excludes radon)												
Radio-Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	7.174E-06	0.0121	3.240E-09	0.0000	3.765E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	3.628E-07	0.0006
Pa-231	7.008E-07	0.0012	7.298E-10	0.0000	5.365E-07	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	1.207E-07	0.0002
Pb-210	1.246E-07	0.0002	1.293E-09	0.0000	4.758E-05	0.0802	0.000E+00	0.0000	0.000E+00	0.0000	4.983E-06	0.0084
Ra-226	2.463E-04	0.4155	1.074E-09	0.0000	2.829E-05	0.0477	0.000E+00	0.0000	0.000E+00	0.0000	1.364E-06	0.0023
Ra-228	7.380E-05	0.1245	2.724E-10	0.0000	4.401E-05	0.0742	0.000E+00	0.0000	0.000E+00	0.0000	2.395E-06	0.0040
Th-228	1.268E-04	0.2139	7.431E-09	0.0000	4.846E-07	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	8.475E-07	0.0014
Th-230	2.869E-08	0.0000	3.131E-09	0.0000	1.936E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	4.464E-07	0.0008
Th-232	5.734E-09	0.0000	2.265E-09	0.0000	1.030E-07	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.431E-07	0.0004
U-234	6.730E-09	0.0000	9.482E-10	0.0000	2.939E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	2.643E-07	0.0004
U-235	1.252E-06	0.0021	7.356E-11	0.0000	2.631E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.393E-08	0.0000
U-238	2.961E-06	0.0050	7.777E-10	0.0000	3.712E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	3.514E-07	0.0006
Total	4.592E-04	0.7745	2.124E-08	0.0000	1.223E-04	0.2062	0.000E+00	0.0000	0.000E+00	0.0000	1.140E-05	0.0192

0  
Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

Radio-Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Ac-227	0.000E+00	0.0000	7.916E-06	0.0134								
Pa-231	0.000E+00	0.0000	1.359E-06	0.0023								
Pb-210	0.000E+00	0.0000	5.269E-05	0.0889								
Ra-226	0.000E+00	0.0000	2.760E-04	0.4655								
Ra-228	0.000E+00	0.0000	1.202E-04	0.2027								
Th-228	0.000E+00	0.0000	1.282E-04	0.2162								
Th-230	0.000E+00	0.0000	6.718E-07	0.0011								
Th-232	0.000E+00	0.0000	3.541E-07	0.0006								
U-234	0.000E+00	0.0000	5.660E-07	0.0010								
U-235	0.000E+00	0.0000	1.302E-06	0.0022								
U-238	0.000E+00	0.0000	3.684E-06	0.0062								
Total	0.000E+00	0.0000	5.929E-04	1.0000								

\*\* Sum of water independent ground, inhalation, plant, meat, milk, soil  
and water dependent water, fish, plant, meat, milk pathways

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
Radon and its Decay Products at t= 3.000E+02 years

Radionuclides								
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.00CE+00	0.000E+00
Total	0.000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependent

0  
Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+02 years  
0  
Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.921E-11	0.0000	1.319E-14	0.0000	0.000E+00	0.0000	1.528E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.477E-12	0.0000
Pa-231	7.853E-06	0.0132	3.959E-09	0.0000	0.000E+00	0.0000	9.104E-07	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	4.821E-07	0.0008
Pb-210	9.696E-12	0.0000	1.006E-13	0.0000	0.000E+00	0.0000	3.691E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.878E-10	0.0000
Ra-226	2.120E-04	0.3576	2.054E-09	0.0000	0.000E+00	0.0000	6.594E-05	0.1112	0.000E+00	0.0000	0.000E+00	0.0000	5.531E-06	0.0093
Ra-228	1.047E-20	0.0000	4.531E-25	0.0000	0.000E+00	0.0000	1.777E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.454E-22	0.0000
Th-230	3.442E-05	0.0581	3.435E-09	0.0000	0.000E+00	0.0000	1.010E-05	0.0170	0.000E+00	0.0000	0.000E+00	0.0000	1.260E-06	0.0021

Th-232	2.006E-04	0.3384	9.969E-09	0.0000	0.000E+00	0.0000	4.459E-05	0.0752	0.000E+00	0.0000	0.000E+00	0.0000	3.486E-06	0.0059
U-234	5.180E-08	0.0001	9.553E-10	0.0000	0.000E+00	0.0000	3.064E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	2.662E-07	0.0004
U-235	1.273E-06	0.0021	8.459E-11	0.0000	0.000E+00	0.0000	2.896E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.528E-08	0.0000
U-238	2.961E-06	0.0050	7.786E-10	0.0000	0.000E+00	0.0000	3.715E-07	0.0006	0.0C0E+00	0.0000	0.000E+00	0.0000	3.516E-07	0.0006
Total	4.592E-04	0.7745	2.124E-08	0.0000	0.000E+00	0.0000	1.223E-04	0.2062	0.0C0E+00	0.0000	0.000E+00	0.0000	1.140E-05	0.0192

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Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+02 years

## Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Radio-Nuclide	risk	fract.	risk	fract.										
Ac-227	0.000E+00	0.0000	3.223E-11	0.0000										
Pa-231	0.000E+00	0.0000	9.249E-06	0.0156										
Pb-210	0.000E+00	0.0000	4.088E-09	0.0000										
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.835E-04	0.4782
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.240E-20	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.579E-05	0.0772
Th-232	0.000E+00	0.0000	2.487E-04	0.4195										
U-234	0.000E+00	0.0000	6.254E-07	0.0011										
U-235	0.000E+00	0.0000	1.328E-06	0.0022										
U-238	0.000E+00	0.0000	3.685E-06	0.0062										
Total	0.000E+00	0.0000	5.929E-04	1.0000										

\*\*\*CNRSI(i,p,t) includes contribution from decay daughter radionuclides  
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Inrisk : DT-15 ISOU Resident  
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t = 1.000E+03 years

Th-230	3.652E-03	5.407E+01	0.000E+00	0.000E+00	7.345E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.275E+02
Th-232	1.743E-03	2.581E+01	0.000E+00	0.000E+00	3.506E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.088E+01
U-234	1.699E-03	6.288E+01	0.000E+00	0.000E+00	3.418E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.706E+01
U-235	1.488E-04	5.506E+00	0.000E+00	0.000E+00	2.993E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.498E+00
U-238	1.699E-03	6.288E+01	0.000E+00	0.000E+00	3.418E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.706E+01

\* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil  
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of  
Radon and its Decay Products as pCi/yr at t= 1.000E+03 years

0

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependent  
RESRAD, Version 6.5       $T_{1/2}$  Limit = 180 days      11/05/2013 15:12 Page 34

Intrinsic : DT-15 ISOU Resident

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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+03 years

0

Radio-Nuclide	Water Independent Pathways (Inhalation excludes radon)											
	Ground		Inhalation		Plant		Meat		Milk		Soil	
risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	
Ac-227	4.315E-06	0.0084	1.949E-09	0.0000	2.265E-07	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	2.182E-07	0.0004
Pa-231	4.215E-07	0.0008	4.390E-10	0.0000	3.227E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	7.258E-08	0.0001
Pb-210	9.654E-08	0.0002	1.001E-09	0.0000	3.686E-05	0.0717	0.000E+00	0.0000	0.000E+00	0.0000	3.861E-06	0.0075
Ra-226	1.918E-04	0.3731	8.358E-10	0.0000	2.202E-05	0.0428	0.000E+00	0.0000	0.000E+00	0.0000	1.062E-06	0.0021
Ra-228	7.377E-05	0.1435	2.723E-10	0.0000	4.399E-05	0.0856	0.000E+00	0.0000	0.000E+00	0.0000	2.394E-06	0.0047
Th-228	1.268E-04	0.2467	7.428E-09	0.0000	4.844E-07	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	8.472E-07	0.0016
Th-230	2.860E-08	0.0001	3.122E-09	0.0000	1.930E-07	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	4.451E-07	0.0009
Th-232	5.732E-09	0.0000	2.264E-09	0.0000	1.030E-07	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.430E-07	0.0005
U-234	4.080E-09	0.0000	5.749E-10	0.0000	1.782E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	1.603E-07	0.0003
U-235	7.590E-07	0.0015	4.461E-11	0.0000	1.596E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.451E-08	0.0000
U-238	1.795E-06	0.0035	4.716E-10	0.0000	2.251E-07	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	2.131E-07	0.0004
Total	3.997E-04	0.7778	1.840E-08	0.0000	1.046E-04	0.2036	0.000E+00	0.0000	0.000E+00	0.0000	9.530E-06	0.0185

0

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

Radio-Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Ac-227	0.000E+00	0.0000	4.762E-06	0.0093								
Pa-231	0.000E+00	0.0000	8.172E-07	0.0016								
Pb-210	0.000E+00	0.0000	4.082E-05	0.0794								
Ra-226	0.000E+00	0.0000	2.148E-04	0.4181								
Ra-228	0.000E+00	0.0000	1.202E-04	0.2338								
Th-228	0.000E+00	0.0000	1.281E-04	0.2493								
Th-230	0.000E+00	0.0000	6.698E-07	0.0013								
Th-232	0.000E+00	0.0000	3.540E-07	0.0007								
U-234	0.000E+00	0.0000	3.432E-07	0.0007								
U-235	0.000E+00	0.0000	7.896E-07	0.0015								
U-238	0.000E+00	0.0000	2.234E-06	0.0043								
Total	0.000E+00	0.0000	5.139E-04	1.0000								

\*\* Sum of water independent ground, inhalation, plant, meat, milk, soil  
and water dependent water, fish, plant, meat, milk pathways

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
Radon and its Decay Products at t= 1.000E+03 years  
Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Fb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+03 years  
Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.774E-21	0.0000	8.011E-25	0.0000	0.000E+00	0.000C	9.278E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.970E-23	0.0000
Pa-231	4.692E-06	0.0091	2.365E-09	0.0000	0.000E+00	0.000C	5.439E-07	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	2.880E-07	0.0006
Pb-210	2.681E-21	0.0000	2.781E-23	0.0000	0.000E+00	0.000C	1.020E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.072E-19	0.0000
Ra-226	1.095E-04	0.2130	1.060E-09	0.0000	0.000E+00	0.000C	3.404E-05	0.0662	0.000E+00	0.0000	0.000E+00	0.0000	2.855E-36	0.0056
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Th-230	8.210E-05	0.1598	3.877E-09	0.0000	0.000E+00	0.0000	2.494E-05	0.0485	0.000E+00	0.0000	0.000E+00	0.0000	2.502E-06	0.0049
Th-232	2.006E-04	0.3903	9.965E-09	0.0000	0.000E+00	0.0000	4.458E-05	0.0867	0.000E+00	0.0000	0.000E+00	0.0000	3.484E-06	0.0068
U-234	3.265E-07	0.0006	5.954E-10	0.0000	0.000E+00	0.0000	2.744E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	1.705E-07	0.0003
U-235	8.038E-07	0.0016	6.726E-11	0.0000	0.000E+00	0.0000	2.123E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.727E-08	0.0000
U-238	1.796E-06	0.0035	4.733E-10	0.0000	0.000E+00	0.0000	2.257E-07	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	2.135E-07	0.0004
Total	3.997E-04	0.7778	1.840E-08	0.0000	0.000E+00	0.0000	1.046E-04	0.2036	0.000E+00	0.0000	0.000E+00	0.0000	9.530E-06	0.0185

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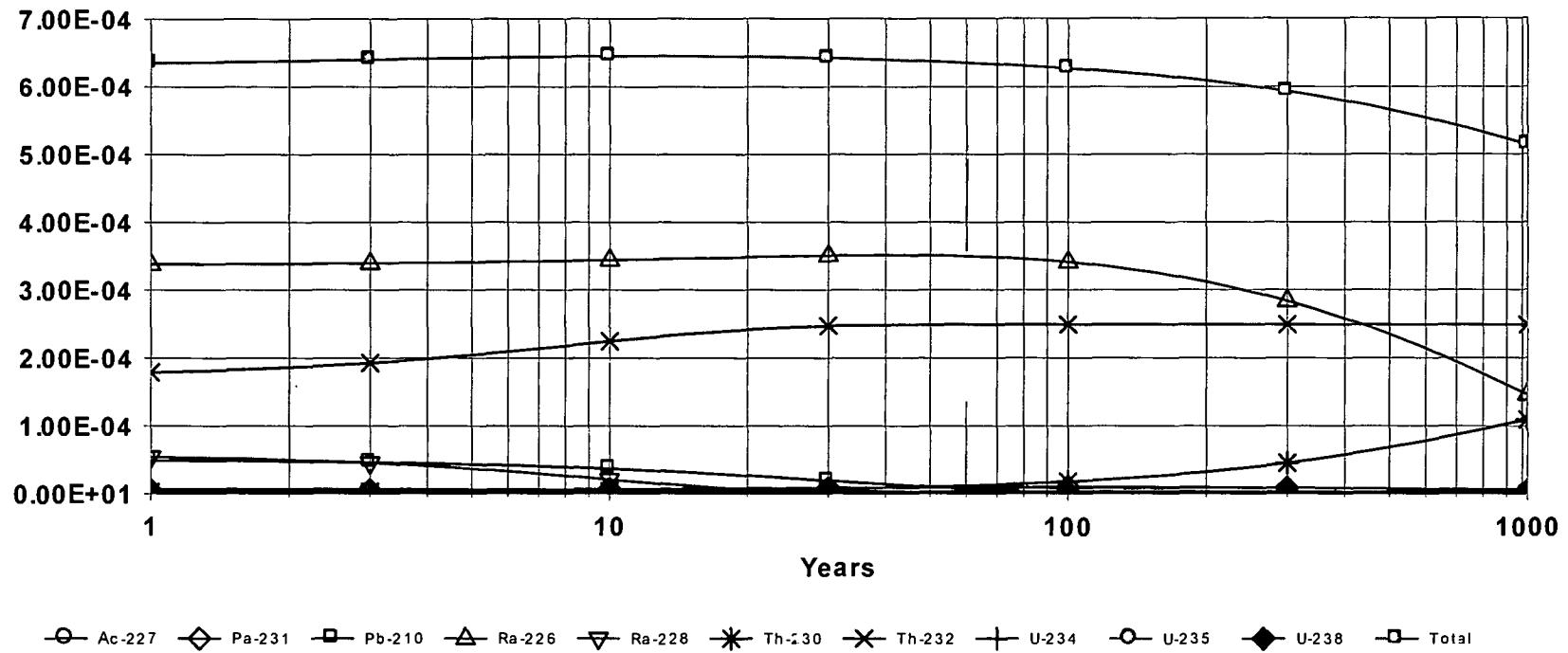
Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t = 1.000E+03 years

#### Water Dependent Pathways

Radio-Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.										
Ac-227	0.000E+00	0.0000	1.957E-21	0.0000										
Pa-231	0.000E+00	0.0000	5.526E-06	0.0108										
Pb-210	0.000E+00	0.0000	1.130E-18	0.0000										
Ra-226	0.000E+00	0.0000	1.464E-04	0.2848										
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000										
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.095E-04	0.2132
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.486E-04	0.4838
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.720E-07	0.0015
U-235	0.000E+00	0.0000	8.424E-07	0.0016										
U-238	0.000E+00	0.0000	2.235E-06	0.0043										
Total	0.000E+00	0.0000	5.139E-04	1.0000										

\*\*\*CNRSI(i,p,t) includes contribution from decay daughter radionuclides

### EXCESS CANCER RISK: All Nuclides Summed, All Pathways Summed



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**Attachment D**

**RESRAD Output for Radiological Cancer Risks Estimated for Resident Gardener  
Exposures to Accessible Soil at DT-15**

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Cancer Risk Slope Factors Summary Table  
Risk Library: HEAST 2001 Morbidity

0 Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Ac-227+D	1.47E-06	3.48E-10	SLPF( 1,1)
Sf-1	Pa-231	1.39E-07	1.39E-07	SLPF( 2,1)
Sf-1	Pb-210+D	1.21E-09	1.41E-09	SLPF( 3,1)
Sf-1	Ra-226+D	3.49E-06	2.29E-08	SLPF( 4,1)
Sf-1	Ra-228+D	1.53E-06	0.00E+00	SLPF( 5,1)
Sf-1	Th-228+D	7.76E-06	5.59E-09	SLPF( 6,1)
Sf-1	Th-230	3.19E-10	8.19E-10	SLPF( 7,1)
Sf-1	Th-232	3.42E-10	3.42E-10	SLPF( 8,1)
Sf-1	U-234	2.52E-10	2.52E-10	SLPF( 9,1)
Sf-1	U-235+D	5.43E-07	5.18E-07	SLPF( 10,1)
Sf-1	U-238	4.99E-11	4.99E-11	SLPF( 11,1)
Sf-1	U-238+D	1.14E-07	4.99E-11	SLPF( 12,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Ac-227+D	2.09E-07	1.49E-07	SLPF( 1,2)
Sf-2	Pa-231	4.55E-08	4.55E-08	SLPF( 2,2)
Sf-2	Pb-210+D	1.39E-08	2.77E-09	SLPF( 3,2)
Sf-2	Ra-226+D	1.16E-08	1.15E-08	SLPF( 4,2)
Sf-2	Ra-228+D	5.23E-09	5.18E-09	SLPF( 5,2)
Sf-2	Th-228+D	1.43E-07	1.32E-07	SLPF( 6,2)

Sf-2	Th-230	2.85E-08	2.85E-08	SLPF( 7,2)
Sf-2	Th-232	4.33E-08	4.33E-08	SLPF( 8,2)
Sf-2	U-234	1.14E-08	1.14E-08	SLPF( 9,2)
Sf-2	U-235+D	1.01E-08	1.01E-08	SLPF( 10,2)
Sf-2	U-238	9.32E-09	9.32E-09	SLPF( 11,2)
Sf-2	U-238+D	9.35E-09	9.32E-09	SLPF( 12,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF( 1,3)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF( 2,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF( 3,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF( 4,3)
Sf-3	Ra-228+D	1.43E-09	1.43E-09	SLPF( 5,3)
Sf-3	Th-228+D	4.22E-10	1.48E-10	SLPF( 6,3)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF( 7,3)
Sf-3	Th-232	1.33E-10	1.33E-10	SLPF( 8,3)
Sf-3	U-234	9.55E-11	9.55E-11	SLPF( 9,3)
Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF( 10,3)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF( 11,3)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF( 12,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	4.86E-10	2.01E-10	SLPF( 1,4)
Sf-3	Pa-231	1.73E-10	1.73E-10	SLPF( 2,4)
Sf-3	Pb-210+D	1.27E-09	8.81E-10	SLPF( 3,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF( 4,4)
Sf-3	Ra-228+D	1.04E-09	1.04E-09	SLPF( 5,4)
Sf-3	Th-228+D	3.00E-10	1.07E-10	SLPF( 6,4)
Sf-3	Th-230	9.10E-11	9.10E-11	SLPF( 7,4)

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Cancer Risk Slope Factors Summary Table (continued)  
Risk Library: HEAST 2001 Morbidity

0 Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-3	Th-232	1.01E-10	1.01E-10	SLPF( 8,4)
Sf-3	J-234	7.07E-11	7.07E-11	SLPF( 9,4)
Sf-3	J-235+D	7.18E-11	6.96E-11	SLPF( 10,4)
Sf-3	J-238	6.40E-11	6.40E-11	SLPF( 11,4)
Sf-3	J-238+D	8.71E-11	6.40E-11	SLPF( 12,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	1.16E-09	3.81E-10	SLPF( 1,5)
Sf-3	Pa-231	3.74E-10	3.74E-10	SLPF( 2,5)
Sf-3	Pb-210+D	2.66E-09	1.84E-09	SLPF( 3,5)
Sf-3	Ra-226+D	7.30E-10	7.29E-10	SLPF( 4,5)
Sf-3	Ra-228+D	2.29E-09	2.28E-09	SLPF( 5,5)

Sf-3	Th-228+D	8.09E-10	2.89E-10	SLPF( 6,5)
Sf-3	Th-230	2.02E-10	2.02E-10	SLPF( 7,5)
Sf-3	Th-232	2.31E-10	2.31E-10	SLPF( 8,5)
Sf-3	U-234	1.58E-10	1.58E-10	SLPF( 9,5)
Sf-3	U-235+D	1.63E-10	1.57E-10	SLPF( 10,5)
Sf-3	U-238	1.43E-10	1.43E-10	SLPF( 11,5)
Sf-3	U-238+D	2.10E-10	1.43E-10	SLPF( 12,5)
Sf-Rn	Radon Inhalation slope factors, 1/(pCi):			
Sf-Rn	Rn-222	1.80E-12	1.80E-12	SLPFRN(1,1)
Sf-Rn	Po-218	3.70E-12	3.70E-12	SLPFRN(1,2)
Sf-Rn	Pb-214	6.20E-12	6.20E-12	SLPFRN(1,3)
Sf-Rn	Bi-214	1.50E-11	1.50E-11	SLPFRN(1,4)
Sf-Rn	Rn-220	1.90E-13	1.90E-13	SLPFRN(2,1)
Sf-Rn	Po-216	3.00E-15	3.00E-15	SLPFRN(2,2)
Sf-Rn	Pb-212	3.90E-11	3.90E-11	SLPFRN(2,3)
Sf-Rn	Bi-212	3.70E-11	3.70E-11	SLPFRN(2,4)
Sf-Rn	Radon K factors, (mrem/WLM) :			
Sf-Rn	Rn-222 Indoor	7.60E+02	7.60E+02	KFACTR(1,1)
Sf-Rn	Rn-222 Outdoor	5.70E+02	5.70E+02	KFACTR(1,2)
Sf-Rn	Rn-220 Indoor	1.50E+02	1.50E+02	KFACTR(2,1)
Sf-Rn	Rn-220 Outdoor	2.50E+02	2.50E+02	KFACTR(2,2)

\*Base Case means Default.Lib w/o Associate Nuclide contributions.  
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## Risk Slope and Environmental Transport Factors for the Ground Pathway

Po-212	0.000E+0C	0.000E+00								
Po-214	3.860E-1C	4.915E-01								
Po-215	7.480E-10	4.943E-01								
Po-216	7.870E-11	4.943E-01								
Po-218	4.260E-11	4.943E-01								
Ra-223	4.340E-07	5.004E-01								
Ra-224	3.720E-08	5.015E-01								
Ra-226	2.290E-08	5.030E-01								
Ra-228	0.000E+00									
Rn-219	2.250E-07	4.984E-01								
Rn-220	1.700E-09	4.920E-01								
Rn-222	1.740E-09	4.920E-01								
Th-227	3.780E-07	5.019E-01								
Th-228	5.590E-09	5.041E-01								
Th-230	8.190E-10	5.057E-01								
Th-231	2.450E-08	5.066E-01								
Th-232	3.420E-10	5.084E-01								
Th-234	1.630E-08	5.067E-01								
Tl-207	1.520E-08	4.943E-01								
Tl-208	1.760E-05	4.970E-01								
Tl-210	0.000E+00	5.384E-01								
U-234	2.520E-10	5.098E-01								
U-235	5.180E-07	5.028E-01								
U-238	4.990E-11	5.273E-01								

\* - Units are 1/yr per (pCi/g) at infinite depth and area. Multiplication by ETFG(i,t) converts to site conditions.

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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t= 0.000E+00 years

Radio-Nuclide	Water Ir-dependent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total Ingestion*
	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	
Ac-227	7.681E-05	2.961E+00	0.000E+00	0.000E+00	1.609E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.570E+00
Pa-231	3.072E-04	4.736E+01	0.000E+00	0.000E+00	6.438E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.380E+01
Pb-210	3.579E-03	5.518E+02	0.000E+00	0.000E+00	7.500E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.268E+02
Ra-226	2.750E-03	1.696E+03	0.000E+00	0.000E+00	5.762E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.753E+03
Ra-228	1.106E-03	6.820E+02	0.000E+00	0.000E+00	2.318E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.052E+02
Th-228	1.398E-03	2.156E+01	0.000E+00	0.000E+00	2.929E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.085E+01
Th-230	2.873E-03	4.431E+01	0.000E+00	0.000E+00	6.019E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.045E+02
Th-232	1.167E-03	1.801E+01	0.000E+00	0.000E+00	2.446E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.247E+01
U-234	2.120E-03	8.171E+01	0.000E+00	0.000E+00	4.442E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.261E+02
U-235	4.609E-05	1.776E+00	0.000E+00	0.000E+00	9.657E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.742E+00
U-238	2.120E-03	8.171E+01	0.000E+00	0.000E+00	4.442E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.261E+02

\* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil

and water-dependent water, fish, plant, meat, milk pathways

0 Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of  
Radon and its Decay Products as pCi/yr at t= 0.000E+00 years  
0 Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependent  
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 0.000E+00 years

Radio-Nuclide	Water Independent Pathways (Inhalation excludes radon)											
	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.220E-06	0.0045	9.717E-10	0.0000	1.180E-07	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	1.133E-07	0.0002
Pa-231	4.109E-07	0.0008	4.148E-10	0.0000	3.176E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	7.144E-08	0.0001
Pb-210	1.354E-07	0.0003	1.363E-09	0.0000	5.222E-05	0.1070	0.000E+00	0.0000	0.000E+00	0.0000	5.472E-06	0.0112
Ra-226	2.241E-04	0.4592	9.471E-10	0.0000	2.599E-05	0.0533	0.000E+00	0.0000	0.000E+00	0.0000	1.253E-06	0.0026
Ra-228	5.029E-05	0.1030	1.800E-10	0.0000	3.029E-05	0.0621	0.000E+00	0.0000	0.000E+00	0.0000	1.649E-06	0.0034
Th-228	8.810E-05	0.1805	5.004E-09	0.0000	3.373E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	5.945E-07	0.0012
Th-230	2.323E-08	0.0000	2.456E-09	0.0000	1.582E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	3.648E-07	0.0007
Th-232	3.964E-09	0.0000	1.517E-09	0.0000	7.185E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.695E-07	0.0003
U-234	5.262E-09	0.0000	7.173E-10	0.0000	2.316E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	2.083E-07	0.0004
U-235	2.430E-07	0.0005	1.382E-11	0.0000	5.148E-09	0.000C	0.000E+00	0.0000	0.000E+00	0.0000	4.682E-09	0.0000
U-238	2.310E-06	0.0047	5.884E-10	0.0000	2.925E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	2.769E-07	0.0006
Total	3.679E-04	0.7537	1.417E-08	0.0000	1.100E-04	0.2254	0.000E+00	0.0000	0.000E+00	0.0000	1.018E-05	0.0209

0 Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 0.000E+00 years

#### Water Dependent Pathways

Radio-Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Ac-227	0.000E+00	0.0000	2.452E-06	0.0050								
Pa-231	0.000E+00	0.0000	8.004E-07	0.0016								

Pb-210	0.000E+00	0.0000	5.783E-05	0.1185								
Ra-226	0.000E+00	0.0000	2.514E-04	0.5150								
Ra-228	0.000E+00	0.0000	8.222E-05	0.1685								
Th-228	0.000E+00	0.0000	8.903E-05	0.1824								
Th-230	0.000E+00	0.0000	5.486E-07	0.0011								
Th-232	0.000E+00	0.0000	2.469E-07	0.0005								
U-234	0.000E+00	0.0000	4.459E-07	0.0009								
U-235	0.000E+00	0.0000	2.528E-07	0.0005								
U-238	0.000E+00	0.0000	2.880E-06	0.0059								
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+03	0.0000	0.000E+00	0.0000	4.881E-04	1.0000

\*\* Sum of water independent ground, inhalation, plant, meat, milk, soil  
and water dependent water, fish, plant, meat, milk pathways

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
Radon and its Decay Products at t= 0.000E+00 years

Radionuclides								
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)														
Radio-Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	6.919E-07	0.0014	3.029E-10	0.0000	0.000E+00	0.0000	3.654E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	3.533E-08	0.0001
Pa-231	1.939E-06	0.0040	1.084E-09	0.0000	0.000E+00	0.0000	3.990E-07	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	1.494E-07	0.0003
Pb-210	9.592E-08	0.0002	9.654E-10	0.0000	0.000E+00	0.0000	3.690E-05	0.0756	0.000E+00	0.0000	0.000E+00	0.0000	3.877E-06	0.0079
Ra-226	2.227E-04	0.4562	1.336E-09	0.0000	0.000E+00	0.0000	4.106E-05	0.0841	0.000E+00	0.0000	0.000E+00	0.0000	2.832E-06	0.0058
Ra-228	3.503E-05	0.0718	1.298E-09	0.0000	0.000E+00	0.0000	7.944E-06	0.0163	0.000E+00	0.0000	0.000E+00	0.0000	5.747E-07	0.0012
Th-228	9.690E-06	0.0199	5.504E-10	0.0000	0.000E+00	0.0000	2.514E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	6.539E-08	0.0001
Th-230	1.542E-06	0.0032	2.464E-09	0.0000	0.000E+00	0.0000	4.084E-07	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	3.809E-07	0.0008
Th-232	9.367E-05	0.1919	4.852E-09	0.0000	0.000E+00	0.0000	2.273E-05	0.0466	0.000E+00	0.0000	0.000E+00	0.0000	1.772E-06	0.0036
U-234	5.365E-09	0.0000	7.175E-10	0.0000	0.000E+00	0.0000	2.316E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	2.083E-07	0.0004
U-235	2.430E-07	0.0005	1.386E-11	0.0000	0.000E+00	0.0000	5.166E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.688E-09	0.0000
U-238	2.310E-06	0.0047	5.884E-10	0.0000	0.000E+00	0.0000	2.925E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	2.769E-07	0.0006

Total 3.679E-04 0.7537 1.417E-08 0.0000 0.000E+00 0.0000 1.100E-04 0.2254 0.000E+00 0.0000 0.000E+00 0.0000 1.018E-05 0.0209  
RESRAD, Version 6.5 T<sub>4</sub> Limit = 180 days 11/05/2013 15:16 Page 8  
Intrinsic : DT-15 Accessible Soil Resident  
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Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 0.000E+00 years

## Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Radio-Nuclide	risk	fract.	risk	fract.										
Ac-227	0.000E+00	0.0000	7.641E-07	0.0016										
Pa-231	0.000E+00	0.0000	2.488E-06	0.0051										
Pb-210	0.000E+00	0.0000	4.087E-05	0.0837										
Ra-226	0.000E+00	0.0000	2.666E-04	0.5461										
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.355E-05	0.0892
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000C	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.781E-06	0.0200
Th-230	0.000E+00	0.0000	2.333E-06	0.0048										
Th-232	0.000E+00	0.0000	1.182E-04	0.2421										
U-234	0.000E+00	0.0000	4.461E-07	0.0009										
U-235	0.000E+00	0.0000	2.529E-07	0.0005										
U-238	0.000E+00	0.0000	2.880E-06	0.0059										
Total	0.000E+00	0.0000	4.881E-04	1.0000										

\*\*\*CNRSI(i,p,t) includes contribution from decay daughter radionuclides  
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Intrinsic : DT-15 Accessible Soil Resident  
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t = 1.000E+00 years

U-238 2.118E-03 8.166E+01 0.000E+00 0.000E+00 4.439E+01 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 1.260E+02

\* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of Radon and its Decay Products as pCi/yr at t= 1.000E+00 years

0

Water-ind. == Water-independent      Water-dep. == Water-dependent  
ESRAD, Version 6.5      T<sub>1/2</sub> Limit = 180 days      11/05/2013 15:16 Page 10  
Intrinsic : DT-15 Accessible Soil Resident  
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+00 years

1

Radio-Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.283E-06	0.0047	9.991E-10	0.0000	1.213E-07	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	1.165E-07	0.0002
Pa-231	4.106E-07	0.0008	4.145E-10	0.0000	3.174E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	7.139E-08	0.0001
Pb-210	1.347E-07	0.0003	1.355E-09	0.0000	5.194E-05	0.1066	0.000E+00	0.0000	0.000E+00	0.0000	5.442E-06	0.0112
Ra-226	2.240E-04	0.4597	9.466E-10	0.0000	2.598E-05	0.0533	0.000E+00	0.0000	0.000E+00	0.0000	1.252E-06	0.0026
Ra-228	5.036E-05	0.1033	1.803E-10	0.0000	3.033E-05	0.0622	0.000E+00	0.0000	0.000E+00	0.0000	1.651E-06	0.0034
Th-228	8.762E-05	0.1798	4.976E-09	0.0000	3.367E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	5.912E-07	0.0012
Th-230	2.323E-08	0.0000	2.456E-09	0.0000	1.582E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	3.648E-07	0.0007
Th-232	3.964E-09	0.0000	1.517E-09	0.0000	7.185E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.695E-07	0.0003
U-234	5.258E-09	0.0000	7.168E-10	0.0000	2.315E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	2.082E-07	0.0004
U-235	2.428E-07	0.0005	1.381E-11	0.0000	5.145E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.679E-09	0.0000
U-238	2.308E-06	0.0047	5.879E-10	0.0000	2.923E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	2.767E-07	0.0006
Total	3.674E-04	0.7539	1.416E-08	0.0000	1.098E-04	0.2253	0.000E+00	0.0000	0.000E+00	0.0000	1.015E-05	0.0208

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+00 years

## Water Dependent Pathways

Ac-227	0.000E+00	0.0000	2.521E-06	0.0052								
Pa-231	0.000E+00	0.0000	7.998E-07	0.0016								
Pb-210	0.000E+00	0.0000	5.752E-05	0.1180								
Ra-226	0.000E+00	0.0000	2.513E-04	0.5155								
Ra-228	0.000E+00	0.0000	8.235E-05	0.1690								
Th-228	0.000E+00	0.0000	8.855E-05	0.1817								
Th-230	0.000E+00	0.0000	5.486E-07	0.0011								
Th-232	0.000E+00	0.0000	2.469E-07	0.0005								
U-234	0.000E+00	0.0000	4.456E-07	0.0009								
U-235	0.000E+00	0.0000	2.526E-07	0.0005								
U-238	0.000E+00	0.0000	2.878E-06	0.0059								
Total	0.000E+00	0.0000	4.874E-04	1.0000								

\*\* Sum of water independent ground, inhalation, plant, meat, milk, soil  
and water dependent water, fish, plant, meat, milk pathways

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Intrinsic : DT-15 Accessible Soil Resident  
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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
Radon and its Decay Products at t= 1.000E+00 years  
Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+00 years  
Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	6.691E-07	0.0014	2.929E-10	0.0000	0.000E+00	0.000C	3.533E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	3.416E-08	0.0001
Pa-231	2.024E-06	0.0042	1.121E-09	0.0000	0.000E+00	0.000C	4.033E-07	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	1.538E-07	0.0003
Pb-210	9.295E-08	0.0002	9.355E-10	0.0000	0.000E+00	0.0000	3.575E-05	0.0734	0.000E+00	0.0000	0.000E+00	0.0000	3.757E-06	0.0077
Ra-226	2.224E-04	0.4564	1.357E-09	0.0000	0.000E+00	0.0000	4.189E-05	0.0860	0.000E+00	0.0000	0.000E+00	0.0000	2.921E-06	0.0060
Ra-228	3.322E-05	0.0682	1.274E-09	0.0000	0.000E+00	0.0000	7.044E-06	0.0145	0.000E+00	0.0000	0.000E+00	0.0000	5.239E-07	0.0011
Th-228	6.745E-06	0.0138	3.831E-10	0.0000	0.000E+00	0.0000	1.750E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.552E-08	0.0001
Th-230	1.642E-06	0.0034	2.465E-09	0.0000	0.000E+00	0.0000	4.271E-07	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	3.822E-07	0.0008
Th-232	9.802E-05	0.2011	5.016E-09	0.0000	0.000E+00	0.0000	2.368E-05	0.0486	0.000E+00	0.0000	0.000E+00	0.0000	1.842E-06	0.0038
U-234	5.371E-09	0.0000	7.170E-10	0.0000	0.000E+00	0.0000	2.315E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	2.082E-07	0.0004

U-235	2.429E-07	0.0005	1.385E-11	0.0000	0.000E+00	0.0000	5.164E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.685E-09	0.0000
U-238	2.308E-06	0.0047	5.880E-10	0.0000	0.000E+00	0.0000	2.923E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	2.767E-07	0.0006

```
Total 3.674E-04 0.7539 1.416E-08 0.0000 0.000E+00 0.0000 1.098E-04 0.2253 0.000E+00 0.0000 0.000E+00 0.0000 1.015E-05 0.0208
```

RESRAD, Version 6.5       $T_{\frac{1}{2}}$  Limit = 180 day

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## Intrinsic : DT-15 Accessible Soil Resident

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Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+00 years

## Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Radio-Nuclide	risk	fract.	risk	fract.										
Ac-227	0.000E+00	0.0000	7.389E-07	0.0015										
Pa-231	0.000E+00	0.0000	2.582E-06	0.0053										
Pb-210	0.000E+00	0.0000	3.961E-05	0.0813										
Ra-226	0.000E+00	0.0000	2.673E-04	0.5484										
Ra-228	0.000E+00	0.0000	4.079E-05	0.0837										
Th-228	0.000E+00	0.0000	6.809E-06	0.0140										
Th-230	0.000E+00	0.0000	2.454E-06	0.0050										
Th-232	0.000E+00	0.0000	1.235E-04	0.2535										
U-234	0.000E+00	0.0000	4.458E-07	0.0009										
U-235	0.000E+00	0.0000	2.527E-07	0.0005										
U-238	0.000E+00	0.0000	2.878E-06	0.0059										
Total	0.000E+00	0.0000	4.874E-04	1.0000										

\*\*\*CNRSI(i,p,t) includes contribution from decay daughter radionuclides  
RESRAD, Version 6.5 T½ Limit = 180 days 11/05/2013 15:16 Page 13  
Intrinsic : DT-15 Accessible Soil Resident  
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t = 3.000E+00 years

Th-232	1.167E-03	1.801E+01	0.000E+00	0.000E+00	2.446E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.247E+01
U-234	2.115E-03	8.154E+01	0.000E+00	0.000E+00	4.433E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.259E+02
U-235	4.599E-05	1.773E+00	0.000E+00	0.000E+00	9.636E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.736E+00
U-238	2.115E-03	8.154E+01	0.000E+00	0.000E+00	4.433E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.259E+02

\* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil  
and water-dependent water, fish, plant, meat, milk pathways

0  
Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of  
Radon and its Decay Products as pCi/yr at t = 3.000E+00 years

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependent  
RESRAD, Version 6.5      T½ Limit = 180 days      11/05/2013 15:16 Page 14  
Intrinsic : DT-15 Accessible Soil Resident  
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t = 3.000E+00 years												
Water Independent Pathways (Inhalation excludes radon)												
Radio-Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.401E-06	0.0049	1.051E-09	0.0000	1.276E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	1.226E-07	0.0003
Pa-231	4.100E-07	0.0008	4.139E-10	0.0000	3.169E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	7.129E-08	0.0001
Pb-210	1.333E-07	0.0003	1.341E-09	0.0000	5.140E-05	0.1057	0.000E+00	0.0000	0.000E+00	0.0000	5.386E-06	0.0111
Ra-226	2.238E-04	0.4601	9.457E-10	0.0000	2.595E-05	0.0534	0.000E+00	0.0000	0.000E+00	0.0000	1.251E-06	0.0026
Ra-228	5.049E-05	0.1038	1.807E-10	0.0000	3.041E-05	0.0625	0.000E+00	0.0000	0.000E+00	0.0000	1.655E-06	0.0034
Th-228	8.715E-05	0.1792	4.950E-09	0.0000	3.358E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	5.881E-07	0.0012
Th-230	2.323E-08	0.0000	2.456E-09	0.0000	1.582E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	3.647E-07	0.0007
Th-232	3.964E-09	0.0000	1.517E-09	0.0000	7.185E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.695E-07	0.0003
U-234	5.251E-09	0.0000	7.158E-10	0.0000	2.311E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	2.079E-07	0.0004
U-235	2.425E-07	0.0005	1.379E-11	0.0000	5.137E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.672E-09	0.0000
U-238	2.305E-06	0.0047	5.871E-10	0.0000	2.919E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	2.763E-07	0.0006
Total	3.670E-04	0.7545	1.417E-08	0.0000	1.093E-04	0.2247	0.000E+00	0.0000	0.000E+00	0.0000	1.010E-05	0.0208

0  
Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t = 3.000E+00 years

Water Dependent Pathways

Radio-Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Ac-227	0.000E+00	0.0000	2.653E-06	0.0055								
Pa-231	0.000E+00	0.0000	7.986E-07	0.0016								
Pb-210	0.000E+00	0.0000	5.692E-05	0.1170								
Ra-226	0.000E+00	0.0000	2.510E-04	0.5161								
Ra-228	0.000E+00	0.0000	8.255E-05	0.1697								
Th-228	0.000E+00	0.0000	8.808E-05	0.1811								
Th-230	0.000E+00	0.0000	5.486E-07	0.0011								
Th-232	0.000E+00	0.0000	2.469E-07	0.0005								
U-234	0.000E+00	0.0000	4.450E-07	0.0009								
U-235	0.000E+00	0.0000	2.523E-07	0.0005								
U-238	0.000E+00	0.0000	2.874E-06	0.0059								
Total	0.000E+00	0.0000	4.864E-04	1.0000								

\*\* Sum of water independent ground, inhalation, plant, meat, milk, soil  
and water dependent water, fish, plant, meat, milk pathways

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Intrinsic : DT-15 Accessible Soil Resident

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
Radon and its Decay Products at t= 3.000E+00 years

Radionuclides								
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependent

0 Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existing Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)														
Radio-Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	6.256E-07	C.0013	2.738E-10	0.0000	0.000E+00	0.0000	3.303E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	3.194E-08	0.0001
Pa-231	2.186E-06	C.0045	1.191E-09	0.0000	0.000E+00	0.0000	4.114E-07	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	1.619E-07	0.0003
Pb-210	8.729E-08	0.0002	8.785E-10	0.0000	0.000E+00	0.0000	3.358E-05	0.0690	0.000E+00	0.0000	0.000E+00	0.0000	3.528E-06	0.0073
Ra-226	2.220E-04	0.4565	1.398E-09	0.0000	0.000E+00	0.0000	4.347E-05	0.0894	0.000E+00	0.0000	0.000E+00	0.0000	3.089E-06	0.0064
Ra-228	2.848E-05	0.0586	1.137E-09	0.0000	0.000E+00	0.0000	5.536E-06	0.0114	0.000E+00	0.0000	0.000E+00	0.0000	4.275E-07	0.0009
Th-228	3.268E-06	0.0067	1.856E-10	0.0000	0.000E+00	0.0000	8.478E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.205E-08	0.0000

Th-230	1.844E-06	0.0038	2.466E-09	0.0000	0.000E+00	0.0000	4.658E-07	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	3.849E-07	0.0008
Th-232	1.059E-04	0.2177	5.324E-09	0.0000	0.000E+00	0.0000	2.527E-05	0.0520	0.000E+00	0.0000	0.000E+00	0.0000	1.963E-06	0.0040
U-234	5.387E-09	0.0000	7.160E-10	0.0000	0.000E+00	0.0000	2.312E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	2.079E-07	0.0004
U-235	2.425E-07	0.0005	1.384E-11	0.0000	0.000E+00	0.0000	5.159E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.680E-09	0.0000
U-238	2.305E-06	0.0047	5.871E-10	0.0000	0.000E+00	0.0000	2.919E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	2.763E-07	0.0006
<b>Total</b>	<b>3.670E-04</b>	<b>0.7545</b>	<b>1.417E-08</b>	<b>0.0000</b>	<b>0.000E+00</b>	<b>0.0000</b>	<b>1.093E-04</b>	<b>0.2247</b>	<b>0.000E+00</b>	<b>0.0000</b>	<b>0.000E+00</b>	<b>0.0000</b>	<b>1.010E-05</b>	<b>0.0208</b>

Total 3.67E-04 0.7545 1.41E-05 0.0000 0.0000 0.0000 1.0352 0.1 0.2247  
RESRAD, Version 6.5 T<sup>3</sup> Limit = 180 days 11/05/2013 15:16 Page 16

Intrinsic : DT-15 Accessible Soil Residen

INTFRISK : DI-15 ACCESSIBLE SOIL Resident  
File : C:\BESBAD FAMILY\BESBAD\6.5\USERFILES\DT15.ACCESS.BES-BAD

File : C:\RESR

Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t = 3.000E+00 years

## Water Dependent Pathways

Radio-Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.										
Ac-227	0.0000E+00	0.0000	6.908E-07	0.0014										
Pa-231	0.0000E+00	0.0000	2.760E-06	0.0057										
Pb-210	0.0000E+00	0.0000	3.719E-05	0.0765										
Ra-226	0.0000E+00	0.0000	2.686E-04	0.5522										
Ra-228	0.0000E+00	0.0000	3.445E-05	0.0708										
Th-228	0.0000E+00	0.0000	3.299E-06	0.0068										
Th-230	0.0000E+00	0.0000	2.697E-06	0.0055										
Th-232	0.0000E+00	0.0000	1.331E-04	0.2737										
U-234	0.0000E+00	0.0000	0.0000E+00	0.0000	0.0000E+00	0.0000	0.0000E+00	0.0000	C.0000E+00	0.0000	0.0000E+00	0.0000	4.452E-07	0.0009
U-235	0.0000E+00	0.0000	0.0000E+00	0.0000	0.0000E+00	0.0000	0.0000E+00	0.0000	C.0000E+00	0.0000	0.0000E+00	0.0000	2.524E-07	0.0005
U-238	0.0000E+00	0.0000	0.0000E+00	0.0000	0.0000E+00	0.0000	0.0000E+00	0.0000	C.0000E+00	0.0000	0.0000E+00	0.0000	2.874E-06	0.0059
Total	0.0000E+00	0.0000	0.0000E+00	0.0000	0.0000E+00	0.0000	0.0000E+00	0.0000	C.0000E+00	0.0000	0.0000E+00	0.0000	4.864E-04	1.0000

\*\*\*CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RESBAD, Version 6.5      T<sub>90</sub> Limit = 180

Intrinsic : DT=15 Accessible Soil Resident

INITISK : BT-15 ACCESSIBLE SOIL Resident  
File : C:\BESBAD FAMILY\BESBAD\6-5\USERFILES\BT15 ACCESS.BES-BAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/vr at t = 1.000E+01 years

Ra-228	1.146E-03	7.035E+02	0.000E+00	0.000E+00	2.401E+01	0.000E+00	7.275E+02						
Th-228	1.146E-03	2.628E+01	0.000E+00	0.000E+00	2.401E+01	0.000E+00	5.029E+01						
Th-230	2.873E-03	4.431E+01	0.000E+00	0.000E+00	6.019E+01	0.000E+00	1.045E+02						
Th-232	1.167E-03	1.801E+01	0.000E+00	0.000E+00	2.446E+01	0.000E+00	4.247E+01						
U-234	2.105E-03	8.113E+01	0.000E+00	0.000E+00	4.410E+01	0.000E+00	1.252E+02						
U-235	4.576E-05	1.764E+00	0.000E+00	0.000E+00	9.588E-01	0.000E+00	2.723E+00						
U-238	2.105E-03	8.113E+01	0.000E+00	0.000E+00	4.410E+01	0.000E+00	1.252E+02						

\* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil  
and water-dependent water, fish, plant, meat, milk pathways

0  
Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of  
Radon and its Decay Products as pCi/yr at t= 1.000E+01 years  
0 Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependent  
RESRAD, Version 6.5      T<sub>1/2</sub> Limit = 180 days      11/05/2013 15:16 Page 18  
Intrinsic : DT-15 Accessible Soil Resident  
File : C:\RESRAD\_FAMILY\RESRAD\6.5\USERFILES\DT15 ACCESS RES.RAD

Radio-Nuclide	Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 1.000E+01 years											
	Water Independent Pathways (Inhalation excludes radon)											
	Ground		Inhalation		Plant		Meat		Milk		Soil	
risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk
Ac-227	2.757E-06	0.0057	1.207E-09	0.0000	1.463E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	1.407E-07	0.0003
Pa-231	4.079E-07	0.0008	4.118E-10	0.0000	3.153E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	7.092E-08	0.0001
Pb-210	1.289E-07	0.0003	1.298E-09	0.0000	4.973E-05	0.1027	0.000E+00	0.0000	0.000E+00	0.0000	5.211E-06	0.0108
Ra-226	2.230E-04	0.4604	9.425E-10	0.0000	2.587E-05	0.0534	0.000E+00	0.0000	0.000E+00	0.0000	1.247E-06	0.0026
Ra-228	5.075E-05	0.1048	1.817E-10	0.0000	3.057E-05	0.0631	0.000E+00	0.0000	0.000E+00	0.0000	1.664E-06	0.0034
Th-228	8.714E-05	0.1799	4.949E-09	0.0000	3.364E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	5.880E-07	0.0012
Th-230	2.323E-08	0.0000	2.456E-09	0.0000	1.582E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	3.647E-07	0.0008
Th-232	3.964E-09	0.0000	1.517E-09	0.0000	7.185E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.695E-07	0.0003
U-234	5.225E-09	0.0000	7.122E-10	0.0000	2.300E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	2.068E-07	0.0004
U-235	2.412E-07	0.0005	1.372E-11	0.0000	5.112E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.649E-09	0.0000
U-238	2.293E-06	0.0047	5.842E-10	0.0000	2.904E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	2.749E-07	0.0006
Total	3.668E-04	0.7571	1.427E-08	0.0000	1.077E-04	0.2223	0.000E+00	0.0000	0.000E+00	0.0000	9.942E-06	0.0205

0  
Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+01 years

Water Dependent Pathways

Radio-Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Ac-227	0.000E+00	0.0000	3.045E-06	0.0063								
Pa-231	0.000E+00	0.0000	7.945E-07	0.0016								
Pb-210	0.000E+00	0.0000	5.507E-05	0.1137								
Ra-226	0.000E+00	0.0000	2.502E-04	0.5164								
Ra-228	0.000E+00	0.0000	8.298E-05	0.1713								
Th-228	0.000E+00	0.0000	8.807E-05	0.1818								
Th-230	0.000E+00	0.0000	5.486E-07	0.0011								
Th-232	0.000E+00	0.0000	2.469E-07	0.0005								
U-234	0.000E+00	0.0000	4.427E-07	0.0009								
U-235	0.000E+00	0.0000	2.510E-07	0.0005								
U-238	0.000E+00	0.0000	2.859E-06	0.0059								
Total	0.000E+00	0.0000	4.845E-04	1.0000								

\*\* Sum of water independent ground, inhalation, plant, meat, milk, soil  
and water dependent water, fish, plant, meat, milk pathways

RESRAD, Version 6.5      T½ Limit = 180 days      11/05/2013 15:16 Page 19  
Intrinsic : DT-15 Accessible Soil Resident  
File : C:\RESRAD\_FAMILY\RESRAD\6.5\USERFILES\DT15 ACCESS RES.RAD

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
Radon and its Decay Products at t= 1.000E+01 years

Radionuclides								
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Fo-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.030E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.030E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.030E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent      Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)														
Ground			Inhalation		Radon		Plant		Meat		Milk			
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	4.944E-07	0.0010	2.164E-10	0.0000	0.000E+00	0.0000	2.611E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	2.524E-03	0.0001
Pa-231	2.670E-06	0.0055	1.402E-09	0.0000	0.000E+00	0.0000	4.355E-07	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	1.864E-07	0.0004
Pb-210	7.004E-08	0.0001	7.049E-10	0.0000	0.000E+00	0.0000	2.694E-05	0.0556	0.000E+00	0.0000	0.000E+00	0.0000	2.831E-06	0.0058

Ra-226	2.206E-04	0.4553	1.520E-09	0.0000	0.000E+00	0.0000	4.820E-05	0.0995	0.000E+00	0.0000	0.000E+00	0.0000	3.596E-06	0.0074
Ra-228	1.356E-05	0.0280	5.643E-10	0.0000	0.000E+00	0.0000	2.376E-06	0.0049	0.000E+00	0.0000	0.000E+00	0.0000	1.923E-07	0.0004
Th-228	2.587E-07	0.0005	1.469E-11	0.0000	0.000E+00	0.0000	6.711E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.746E-09	0.0000
Th-230	2.544E-06	0.0053	2.470E-09	0.0000	0.000E+00	0.0000	6.112E-07	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	3.955E-07	0.0008
Th-232	1.241E-04	0.2561	6.069E-09	0.0000	0.000E+00	0.0000	2.860E-05	0.0590	0.000E+00	0.0000	0.000E+00	0.0000	2.227E-06	0.0046
U-234	5.462E-09	0.0000	7.125E-10	0.0000	0.000E+00	0.0000	2.300E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	2.069E-07	0.0004
U-235	2.414E-07	0.0005	1.380E-11	0.0000	0.000E+00	0.0000	5.142E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.660E-09	0.0000
U-238	2.293E-06	0.0047	5.842E-10	0.0000	0.000E+00	0.0000	2.905E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	2.749E-07	0.0006

Total 3.668E-04 0.7571 1.427E-08 0.0000 0.000E+00 0.0000 1.077E-04 0.2223  
RESRAD, Version 6.5 T<sub>1/2</sub> Limit = 180 days 11/05/2013 15:16 Page 20  
Intrinsic : DT-15 Accessible Soil Resident  
File : C:\RESRAD FAMILY\RESRAD\6.5\USERFILES\DT15 ACCESS RES.RAD

Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t = 1.000E+01 years

## Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Radio-Nuclide	risk	fract.	risk	fract.										
Ac-227	0.000E+00	0.0000	5.460E-07	0.0011										
Pa-231	0.000E+00	0.0000	3.293E-06	0.0068										
Pb-210	0.000E+00	0.0000	2.984E-05	0.0616										
Ra-226	0.000E+00	0.0000	2.724E-04	0.5622										
Ra-228	0.000E+00	0.0000	1.613E-05	0.0333										
Th-228	0.000E+00	0.0000	2.612E-07	0.0005										
Th-230	0.000E+00	0.0000	3.554E-06	0.0073										
Th-232	0.000E+00	0.0000	1.549E-04	0.3197										
U-234	0.000E+00	0.0000	4.431E-07	0.0009										
U-235	0.000E+00	0.0000	2.512E-07	0.0005										
U-238	0.000E+00	0.0000	2.859E-06	0.0059										
Total	0.000E+00	0.0000	4.845E-04	1.0000										

\*\*\*CNRSI(i,p,t) includes contribution from decay daughter radionuclides  
RESRAD, Version 6.5 T<sub>1/2</sub> Limit = 180 days 11/05/2013 15:16 Page 21  
Intrinsic : DT-15 Accessible Soil Resident  
File : C:\RESRAD FAMILY\RESRAD\6.5\USERFILES\DT15\_ACCESS.RES.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t = 3.000E+01 years

Pa-231	3.006E-04	4.633E+01	0.000E+00	0.000E+00	6.298E-00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.263E+01
Pb-210	3.040E-03	4.699E+02	0.000E+00	0.000E+00	6.369E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.336E+02
Ra-226	2.710E-03	1.671E+03	0.000E+00	0.000E+00	5.678E+01	0.000E+00	0.000E+C0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.728E+03
Ra-228	1.161E-03	7.130E+02	0.000E+00	0.000E+00	2.433E+01	0.000E+00	0.000E+C0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.373E+02
Th-228	1.160E-03	2.662E+01	0.000E+00	0.000E+00	2.431E+01	0.000E+00	0.000E+C0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.094E+01
Th-230	2.872E-03	4.430E+01	0.000E+00	0.000E+00	6.019E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.045E+02
Th-232	1.167E-03	1.801E+01	0.000E+00	0.000E+00	2.446E+01	0.00CE+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.247E+01
U-234	2.075E-03	7.998E+01	0.000E+00	0.000E+00	4.348E+01	0.00CE+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.235E+02
U-235	4.511E-05	1.739E+00	0.000E+00	0.000E+00	9.452E-01	0.00CE+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.684E+00
U-238	2.075E-03	7.998E+01	0.000E+00	0.000E+00	4.348E+01	0.00CE+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.235E+02

\* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil  
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of  
Radon and its Decay Products as pCi/yr at t= 3.000E+01 years

0

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.C00E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.G00E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent      Water-dep. == Water-dependent  
RESRAD, Version 6.5      T½ Limit = 180 days      11/05/2013 15:16 Page 22  
Intrinsic : DT-15 Accessible Soil Resident  
File : C:\RESRAD\_FAMILY\RESRAD\6.5\USERFILES\DT15 ACCESS RES.RAD

Radio-Nuclide	Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 3.000E+01 years											
	Water Independent Pathways (Inhalation excludes radon)											
Radio-Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	3.391E-06	0.0071	1.484E-09	0.0000	1.798E-07	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	1.731E-07	0.0004
Pa-231	4.020E-07	0.0008	4.058E-10	0.0000	3.107E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	6.989E-08	0.0001
Pb-210	1.204E-07	0.0003	1.211E-09	0.0000	4.644E-05	0.0963	0.000E+00	0.0000	0.000E+00	0.0000	4.864E-06	0.0101
Ra-226	2.209E-04	0.4604	9.334E-10	0.0000	2.562E-05	0.0534	0.000E+00	0.0000	0.000E+00	0.0000	1.235E-06	0.0026
Ra-228	5.093E-05	0.1062	1.823E-10	0.0000	3.068E-05	0.0639	0.000E+00	0.0000	0.000E+00	0.0000	1.670E-06	0.0035
Th-228	8.755E-05	0.1825	4.972E-09	0.0000	3.378E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	5.907E-07	0.0012
Th-230	2.323E-08	0.0000	2.456E-09	0.0000	1.582E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	3.647E-07	0.0008
Th-232	3.964E-09	0.0000	1.517E-09	0.0000	7.185E-08	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.695E-07	0.0004
U-234	5.150E-09	0.0000	7.021E-10	0.0000	2.267E-07	0.0005	0.000E-00	0.0000	0.000E+00	0.0000	2.039E-07	0.0004
U-235	2.378E-07	0.0005	1.352E-11	0.0000	5.039E-09	0.0000	0.000E-00	0.0000	0.000E+00	0.0000	4.583E-09	0.0000
U-238	2.261E-06	0.0047	5.759E-10	0.0000	2.863E-07	0.0006	0.000E-00	0.0000	0.000E+00	0.0000	2.710E-07	0.0006
Total	3.658E-04	0.7625	1.445E-08	0.0000	1.043E-04	0.2174	0.000E-00	0.0000	0.000E+00	0.0000	9.617E-06	0.0200

0

Excess Cancer Risks CNRS(*i,p,t*) for Individual Radionuclides (*i*) and Pathways (*p*)  
and Fraction of Total Risk at  $t = 3.000E+01$  years

## Water Dependent Pathways

	Water		Fish		Plant		Meat		Milk		All Pathways**	
Radio-Nuclide	risk	fract.	risk	fract.								
Ac-227	0.000E+00	0.0000	3.746E-06	0.0078								
Pa-231	0.000E+00	0.0000	7.830E-07	0.0016								
Pb-210	0.000E+00	0.0000	5.142E-05	0.1072								
Ra-226	0.000E+00	0.0000	2.477E-04	0.5164								
Ra-228	0.000E+00	0.0000	8.328E-05	0.1736								
Th-228	0.000E+00	0.0000	8.848E-05	0.1844								
Th-230	0.000E+00	0.0000	5.486E-07	0.0011								
Th-232	0.000E+00	0.0000	2.469E-07	0.0005								
U-234	0.000E+00	0.0000	4.365E-07	0.0009								
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.030E+00	0.0000	2.475E-07	0.0005
U-238	0.000E+00	0.0000	2.819E-06	0.0059								
Total	0.000E+00	0.0000	4.798E-04	1.0000								

\*\* Sum of water independent ground, inhalation, plant, meat, milk, soil and water dependent water, fish, plant, meat, milk pathways

and water dependent water, such as plants, meat, milk pathways  
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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
 Radon and its Decay Products at t = 3.000E+01 years  
 Radionuclides

0

Water-ind. == Water-independent      Water-dep. == Water-dependent

6

Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t = 3.000E+01 years

4

Water Independent Pathways (Inhalation excludes radon)

5

Ac-227	2.525E-07	0.0005	1.105E-10	0.0000	0.000E+00	0.0000	1.333E-03	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.289E-08	0.0000
Pa-231	3.540E-06	0.0074	1.780E-09	0.0000	0.000E+00	0.0000	4.771E-07	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	2.301E-07	0.0005
Pb-210	3.735E-08	0.0001	3.759E-10	0.0000	0.000E+00	0.0000	1.437E-05	0.0299	0.000E+00	0.0000	0.000E+00	0.0000	1.509E-06	0.0031
Ra-226	2.165E-04	0.4512	1.739E-09	0.0000	0.000E+00	0.0000	5.675E-05	0.1183	0.000E+00	0.0000	0.000E+00	0.0000	4.522E-06	0.0094
Ra-228	1.232E-06	0.0026	5.165E-11	0.0000	0.000E+00	0.0000	2.111E-07	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	1.727E-08	0.0000
Th-228	1.844E-10	0.0000	1.047E-14	0.0000	0.000E+00	0.0000	4.784E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.244E-12	0.0000
Th-230	4.522E-06	0.0094	2.485E-09	0.0000	0.000E+00	0.0000	1.091E-06	0.0023	0.000E+00	0.0000	0.000E+00	0.0000	4.327E-07	0.0009
Th-232	1.372E-04	0.2861	6.619E-09	0.0000	0.000E+00	0.0000	3.088E-05	0.0644	0.000E+00	0.0000	0.000E+00	0.0000	2.413E-06	0.0050
U-234	5.851E-09	0.0000	7.027E-10	0.0000	0.000E+00	0.0000	2.269E-C7	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	2.040E-07	0.0004
U-235	2.382E-07	0.0005	1.371E-11	0.0000	0.000E+00	0.0000	5.098E-C9	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.607E-09	0.0000
U-238	2.261E-06	0.0047	5.760E-10	0.0000	0.000E+00	0.0000	2.864E-C7	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	2.710E-07	0.0006
Total	3.658E-04	0.7625	1.445E-08	0.0000	0.000E+00	0.0000	1.043E-C4	0.2174	0.000E+00	0.0000	0.000E+00	0.0000	9.617E-06	0.0200

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Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+01 years

#### Water Dependent Pathways

Radio-Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.										
Ac-227	0.000E+00	0.0000	2.788E-07	0.0006										
Pa-231	0.000E+00	0.0000	4.249E-06	0.0089										
Pb-210	0.000E+00	0.0000	1.591E-05	0.0332										
Ra-226	0.000E+00	0.0000	2.778E-04	0.5790										
Ra-228	0.000E+00	0.0000	1.460E-06	0.0030										
Th-228	0.000E+00	0.0000	1.861E-10	0.0000										
Th-230	0.000E+00	0.0000	6.048E-06	0.0126										
Th-232	0.000E+00	0.0000	1.705E-04	0.3555										
U-234	0.000E+00	0.0000	4.374E-07	0.0009										
U-235	0.000E+00	0.0000	2.479E-07	0.0005										
U-238	0.000E+00	0.0000	2.819E-06	0.0059										
Total	0.000E+00	0.0000	4.798E-04	1.0000										

\*\*\*CNRS(i,p,t) includes contribution from decay daughter radionuclides  
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t= 1.000E+02 years

Radio-	Water Independent Pathways (Inhalation w/o radon)		Water Dependent Pathways		Total
	Pathway	QINT	Pathway	QINT	
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00

Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	2.688E-04	1.040E+01	0.000E+00	0.000E+00	5.633E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.603E+01
Pa-231	2.855E-04	4.402E+01	0.000E+00	0.000E+00	5.983E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.000E+01
Pb-210	2.666E-03	4.123E+02	0.000E+00	0.000E+00	5.586E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.681E+02
Ra-226	2.621E-03	1.616E+03	0.000E+00	0.000E+00	5.491E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.671E+03
Ra-228	1.162E-03	7.139E+02	0.000E+00	0.000E+00	2.436E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.382E+02
Th-228	1.162E-03	2.667E+01	0.000E+00	0.000E+00	2.436E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.103E+01
Th-230	2.872E-03	4.429E+01	0.000E+00	0.000E+00	6.017E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.045E+02
Th-232	1.167E-03	1.801E+01	0.000E+00	0.000E+00	2.446E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.247E+01
U-234	1.974E-03	7.608E+01	0.000E+00	0.000E+00	4.136E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.174E+02
U-235	4.291E-05	1.654E+00	0.000E+00	0.000E+00	8.991E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.553E+00
U-238	1.974E-03	7.608E+01	0.000E+00	0.000E+00	4.136E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.174E+02

\* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil  
and water-dependent water, fish, plant, meat, milk pathways

0  
Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of  
Radon and its Decay Products as pCi/yr at t= 1.000E+02 years

Radionuclides								
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Pc-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependent  
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 1.000E+02 years												
Water Independent Pathways (Inhalation excludes radon)												
Radio-Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	3.842E-06	0.0082	1.682E-09	0.0000	2.036E-07	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	1.961E-07	0.0004
Pa-231	3.819E-07	0.0008	3.855E-10	0.0000	2.952E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	6.640E-08	0.0001
Pb-210	1.091E-07	0.0002	1.098E-09	0.0000	4.209E-05	0.0901	0.000E+00	0.0000	0.000E+00	0.0000	4.408E-06	0.0094
Ra-226	2.137E-04	0.4574	9.029E-10	0.0000	2.478E-05	0.0530	0.000E+00	0.0000	0.000E+00	0.0000	1.195E-06	0.0026
Ra-228	5.095E-05	0.1090	1.824E-10	0.0000	3.069E-05	0.0657	0.000E+00	0.0000	0.000E+00	0.0000	1.670E-06	0.0036
Th-228	8.759E-05	0.1875	4.975E-09	0.0000	3.379E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	5.910E-07	0.0013
Th-230	2.322E-08	0.0000	2.455E-09	0.0000	1.581E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	3.646E-07	0.0008
Th-232	3.964E-09	0.0000	1.516E-09	0.0000	7.184E-08	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	1.695E-07	0.0004
U-234	4.899E-09	0.0000	6.678E-10	0.0000	2.156E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	1.939E-07	0.0004
U-235	2.262E-07	0.0005	1.286E-11	0.0000	4.793E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.359E-09	0.0000

U-238	2.151E-06	0.0046	5.478E-10	0.0000	2.724E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	2.578E-07	0.0006
Total	3.590E-04	0.7683	1.442E-08	0.0000	9.912E-05	0.2121	0.000E+00	0.0000	0.000E+00	0.0000	9.117E-06	0.0195

0

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+02 years

#### Water Dependent Pathways

Radio-Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Ac-227	0.000E+00	0.0000	4.243E-06	0.0091								
Pa-231	0.000E+00	0.0000	7.438E-07	0.0016								
Pb-210	0.000E+00	0.0000	4.661E-05	0.0998								
Ra-226	0.000E+00	0.0000	2.397E-04	0.5130								
Ra-228	0.000E+00	0.0000	8.330E-05	0.1783								
Th-228	0.000E+00	0.0000	8.852E-05	0.1895								
Th-230	0.000E+00	0.0000	5.484E-07	0.0012								
Th-232	0.000E+00	0.0000	2.468E-07	0.0005								
U-234	0.000E+00	0.0000	4.152E-07	0.0009								
U-235	0.000E+00	0.0000	2.354E-07	0.0005								
U-238	0.000E+00	0.0000	2.681E-06	0.0057								
Total	0.000E+00	0.0000	4.672E-04	1.0000								

\*\* Sum of water independent ground, inhalation, plant, meat, milk, soil  
and water dependent water, fish, plant, meat, milk pathways

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
Radon and its Decay Products at t= 1.000E+02 years

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.300E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.300E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent    Water-dep. == Water-dependent

Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Ground      Inhalation      Radon      Plant      Meat      Milk      Soil

Radio-Nuclide	risk	fract.												
Ac-227	2.402E-08	0.0001	1.051E-11	0.0000	0.000E+00	0.0000	1.268E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.226E-09	0.0000
Pa-231	4.199E-06	0.0090	2.056E-09	0.0000	0.000E+00	0.0000	4.973E-07	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	2.612E-07	0.0006
Pb-210	4.135E-09	0.0000	4.161E-11	0.0000	0.000E+00	0.0000	1.590E-06	0.0034	0.000E+00	0.0000	0.000E+00	0.0000	1.671E-07	0.0004
Ra-226	2.027E-04	0.4338	1.871E-09	0.0000	0.000E+00	0.0000	6.241E-05	0.1336	0.000E+00	0.0000	0.000E+00	0.0000	5.208E-06	0.0111
Ra-228	2.572E-10	0.0000	1.079E-14	0.0000	0.000E+00	0.0000	4.407E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.606E-12	0.0000
Th-228	1.783E-21	0.0000	1.013E-25	0.0000	0.000E+00	0.0000	4.625E-24	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.203E-23	0.0000
Th-230	1.115E-05	0.0239	2.542E-09	0.0000	0.000E+00	0.0000	3.030E-06	0.0065	0.000E+00	0.0000	0.000E+00	0.0000	5.921E-07	0.0013
Th-232	1.385E-04	0.2965	6.673E-09	0.0000	0.000E+00	0.0000	3.110E-05	0.0666	0.000E+00	0.0000	0.000E+00	0.0000	2.431E-06	0.0052
U-234	9.148E-09	0.0000	6.694E-10	0.0000	0.000E+00	0.0000	2.167E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	1.942E-07	0.0004
U-235	2.274E-07	0.0005	1.347E-11	0.0000	0.000E+00	0.0000	4.957E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.437E-09	0.0000
U-238	2.151E-06	0.0046	5.480E-10	0.0000	0.000E+00	0.0000	2.724E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	2.579E-07	0.0006
Total	3.590E-04	0.7683	1.442E-08	0.0000	0.000E+00	0.0000	9.912E-05	0.2121	0.000E+00	0.0000	0.000E+00	0.0000	9.117E-06	0.0195

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Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 1.000E+02 years

#### Water Dependent Pathways

Radio-Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.										
Ac-227	0.000E+00	0.0000	2.652E-08	0.0001										
Pa-231	0.000E+00	0.0000	4.959E-06	0.0106										
Pb-210	0.000E+00	0.0000	1.762E-06	0.0038										
Ra-226	0.000E+00	0.0000	2.703E-04	0.5785										
Ra-228	0.000E+00	0.0000	3.049E-10	0.0000										
Th-228	0.000E+00	0.0000	1.800E-21	0.0000										
Th-230	0.000E+00	0.0000	1.478E-05	0.0316										
Th-232	0.000E+00	0.0000	1.721E-04	0.3683										
U-234	0.000E+00	0.0000	4.207E-07	0.0009										
U-235	0.000E+00	0.0000	2.368E-07	0.0005										
U-238	0.000E+00	0.0000	2.681E-06	0.0057										
Total	0.000E+00	0.0000	4.672E-04	1.0000										

\*\*\*CNRSI(i,p,t) includes contribution from decay daughter radionuclides

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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t= 3.000E+02 years

Radio-Nuclide	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total Ingestion*
	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	
Ac-227	2.388E-04	9.237E+00	0.000E+00	0.000E+00	5.004E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.424E+01
Pa-231	2.466E-04	3.802E+01	0.000E+00	0.000E+00	5.167E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.319E+01
Pb-210	2.402E-03	3.715E+02	0.000E+00	0.000E+00	5.033E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.218E+02
Ra-226	2.396E-03	1.477E+03	0.000E+00	0.000E+00	5.021E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.528E+03
Ra-228	1.162E-03	7.138E+02	0.000E+00	0.000E+00	2.436E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.381E+02
Th-228	1.162E-03	2.667E+01	0.000E+00	0.000E+00	2.436E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.102E+01
Th-230	2.870E-03	4.426E+01	0.000E+00	0.000E+00	6.013E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.044E+02
Th-232	1.167E-03	1.800E+01	0.000E+00	0.000E+00	2.446E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.246E+01
U-234	1.711E-03	6.595E+01	0.000E+00	0.000E+00	3.585E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.018E+02
U-235	3.719E-05	1.434E+00	0.000E+00	0.000E+00	7.793E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.213E+00
U-238	1.711E-03	6.595E+01	0.000E+00	0.000E+00	3.585E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.018E+02

\* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil  
and water-dependent water, fish, plant, meat, milk pathways

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of  
Radon and its Decay Products as pCi/yr at t = 3.000E+02 years  
Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent      Water-dep. == Water-dependent  
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Radio-Nuclide	Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t = 3.000E+02 years											
	Water Independent Pathways (Inhalation excludes radon)						Water Dependent Pathways (Inhalation w/o radon)					
Ground	Inhalation		Plant		Meat		Milk		Soil			
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	3.378E-06	0.0077	1.479E-09	0.0000	1.790E-07	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	1.724E-07	0.0004
Pa-231	3.298E-07	0.0007	3.330E-10	0.0000	2.549E-07	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	5.735E-08	0.0001
Pb-210	9.879E-08	0.0002	9.942E-10	0.0000	3.812E-05	0.0864	0.000E+00	0.0000	0.000E+00	0.0000	3.993E-06	0.0090
Ra-226	1.955E-04	0.4430	8.261E-10	0.0000	2.267E-05	0.0514	0.000E+00	0.0000	0.000E+00	0.0000	1.093E-06	0.0025
Ra-228	5.094E-05	0.1154	1.823E-10	0.0000	3.068E-05	0.0695	0.000E+00	0.0000	0.000E+00	0.0000	1.670E-06	0.0038
Th-228	8.758E-05	0.1984	4.974E-09	0.0000	3.379E-07	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	5.909E-07	0.0013
Th-230	2.321E-08	0.0001	2.453E-09	0.0000	1.580E-07	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	3.643E-07	0.0008

Th-232	3.964E-09	0.0000	1.516E-09	0.0000	7.183E-08	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	1.695E-07	0.0004
U-234	4.247E-09	0.0000	5.789E-10	0.0000	1.869E-07	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	1.681E-07	0.0004
U-235	1.961E-07	0.0004	1.115E-11	0.0000	4.155E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.779E-09	0.0000
U-238	1.864E-06	0.0042	4.748E-10	0.0000	2.361E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	2.235E-07	0.0005
Total	3.399E-04	0.7702	1.382E-08	0.0000	9.291E-05	0.2105	0.000E+00	0.0000	0.000E+00	0.0000	8.506E-06	0.0193

0

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+02 years

#### Water Dependent Pathways

Radio-Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.								
Ac-227	0.000E+00	0.0000	3.731E-06	0.0085								
Pa-231	0.000E+00	0.0000	6.424E-07	0.0015								
Pb-210	0.000E+00	0.0000	4.222E-05	0.0957								
Ra-226	0.000E+00	0.0000	2.193E-04	0.4968								
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0300	0.000E+00	0.0000	0.000E+00	0.0000	8.329E-05	0.1887
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0300	0.000E+00	0.0000	0.000E+00	0.0000	8.851E-05	0.2005
Th-230	0.000E+00	0.0000	5.480E-07	0.0012								
Th-232	0.000E+00	0.0000	2.468E-07	0.0006								
U-234	0.000E+00	0.0000	3.599E-07	0.0008								
U-235	0.000E+00	0.0000	2.040E-07	0.0005								
U-238	0.000E+00	0.0000	2.324E-06	0.0053								
Total	0.000E+00	0.0000	4.414E-04	1.0000								

\*\* Sum of water independent ground, inhalation, plant, meat, milk, soil  
and water dependent water, fish, plant, meat, milk pathways

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Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
	Water-ind.	Water-dep.	Water-ind.	Water-dep.	Water-ind.	Water-dep.	Water-ind.	Water-dep.
Water-ind.	0.000E+00							
Water-dep.	0.000E+00							
Total	0.000E+00							

Water-ind. == Water-independent    Water-dep. == Water-dependent

0

Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)

and Fraction of Total Risk at t= 3.000E+02 years Water Independent Pathways (Inhalation excludes radon)															
0	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil		
0	Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.894E-11	0.0000	1.267E-14	0.0000	0.000E+00	0.0000	1.528E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.477E-12	0.0000	
Pa-231	3.704E-06	0.0084	1.810E-09	0.0000	0.000E+00	0.0000	4.335E-C7	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	2.296E-07	0.0005	
Pb-210	7.682E-12	0.0000	7.732E-14	0.0000	0.000E+00	0.0000	2.955E-C9	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.105E-10	0.0000	
Ra-226	1.678E-04	0.3801	1.576E-09	0.0000	0.000E+00	0.0000	5.269E-C5	0.1194	0.000E+00	0.0000	0.000E+00	0.0000	4.420E-06	0.0100	
Ra-228	7.860E-21	0.0000	3.296E-25	0.0000	0.000E+00	0.0000	1.347E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.102E-22	0.0000	
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+C0	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
Th-230	2.783E-05	0.0631	2.693E-09	0.0000	0.000E+00	0.0000	8.251E-C6	0.0187	0.000E+00	0.0000	0.000E+00	0.0000	1.029E-06	0.0023	
Th-232	1.385E-04	0.3139	6.673E-09	0.0000	0.000E+00	0.0000	3.109E-C5	0.0704	0.000E+00	0.0000	0.000E+00	0.0000	2.430E-06	0.0055	
U-234	3.263E-08	0.0001	5.832E-10	0.0000	0.000E+00	0.0000	1.949E-07	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	1.693E-07	0.0004	
U-235	1.995E-07	0.0005	1.282E-11	0.0000	0.000E+00	0.0000	4.572E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.992E-09	0.0000	
U-238	1.864E-06	0.0042	4.753E-10	0.0000	0.000E+00	0.0000	2.362E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	2.236E-07	0.0005	
Total	3.399E-04	0.7702	1.382E-08	0.0000	0.000E+00	0.0000	9.291E-05	0.2105	0.000E+00	0.0000	0.000E+00	0.0000	8.506E-06	0.0193	
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Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t= 3.000E+02 years

#### Water Dependent Pathways

Water Dependent Pathways															
Radio-Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways		
	risk	fract.	risk	risk	fract.	risk	fract.								
Ac-227	0.000E+00	0.0000	3.196E-11	0.0000											
Pa-231	0.000E+00	0.0000	4.369E-06	0.0099											
Pb-210	0.000E+00	0.0000	3.273E-09	0.0000											
Ra-226	0.000E+00	0.0000	2.249E-04	0.5095											
Ra-228	0.000E+00	0.0000	9.317E-21	0.0000											
Th-228	0.000E+00	0.0000	0.000E+00	0.0000											
Th-230	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	3.711E-05	0.0841	
Th-232	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	1.721E-04	0.3898	
U-234	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	3.973E-07	0.0009	
U-235	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	2.080E-07	0.0005	
U-238	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	2.325E-06	0.0053	
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	4.414E-04	1.0000	

\*\*\*CNRSI(i,p,t) includes contribution from decay daughter radionuclides  
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
As pCi/yr at t= 1.000E+03 years

Radio-Nuclide	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total Ingestion*
	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	
Ac-227	1.430E-04	5.531E+00	0.000E+00	0.000E+00	2.996E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.528E+00
Pa-231	1.477E-04	2.276E+01	0.000E+00	0.000E+00	3.094E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.586E+01
Pb-210	1.868E-03	2.890E+02	0.000E+00	0.000E+00	3.915E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.281E+02
Ra-226	1.872E-03	1.155E+03	0.000E+00	0.000E+00	3.923E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.194E+03
Ra-228	1.162E-03	7.135E+02	0.000E+00	0.000E+00	2.435E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.378E+02
Th-228	1.162E-03	2.665E+01	0.000E+00	0.000E+00	2.435E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.100E+01
Th-230	2.859E-03	4.409E+01	0.000E+00	0.000E+00	5.990E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.040E+02
Th-232	1.167E-03	1.800E+01	0.000E+00	0.000E+00	2.445E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.244E+01
U-234	1.037E-03	3.999E+01	0.000E+00	0.000E+00	2.174E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.172E+01
U-235	2.255E-05	8.693E-01	0.000E+00	0.000E+00	4.725E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.342E+00
U-238	1.037E-03	3.999E+01	0.000E+00	0.000E+00	2.174E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.172E+01

\* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil  
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of  
Radon and its Decay Products as pCi/yr at t= 1.000E+03 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.00CE+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.00CE+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent      Water-dep. == Water-dependent  
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction cf Total Risk at t= 1.000E+03 years

0

Radio-Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.023E-06	0.0053	8.853E-10	0.0000	1.072E-07	0.0033	0.000E+00	0.0000	0.000E+00	0.0000	1.033E-07	0.0003
Pa-231	1.975E-07	0.0005	1.994E-10	0.0000	1.527E-07	0.0034	0.000E+00	0.0000	0.000E+00	0.0000	3.434E-08	0.0001
Pb-210	7.701E-08	0.0002	7.750E-10	0.0000	2.972E-05	0.0779	0.000E+00	0.0000	0.000E+00	0.0000	3.112E-06	0.0082
Ra-226	1.531E-04	0.4013	6.469E-10	0.0000	1.775E-05	0.0455	0.000E+00	0.0000	0.000E+00	0.0000	8.560E-07	0.0022

Ra-228	5.092E-05	0.1335	1.823E-10	0.0000	3.067E-05	0.0804	0.000E+00	0.0000	0.000E+00	0.0000	1.669E-06	0.00444
Th-228	8.754E-05	0.2295	4.972E-09	0.0000	3.378E-07	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	5.907E-07	0.0015
Th-230	2.312E-08	0.0001	2.444E-09	0.0000	1.574E-07	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	3.630E-07	0.0010
Th-232	3.962E-09	0.0000	1.516E-09	0.0000	7.180E-08	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	1.694E-07	0.0004
U-234	2.575E-09	0.0000	3.510E-10	0.0000	1.133E-07	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	1.019E-07	0.0003
U-235	1.189E-07	0.0003	6.761E-12	0.0000	2.519E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.291E-09	0.0000
U-238	1.130E-06	0.0030	2.879E-10	0.0000	1.431E-07	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	1.355E-07	0.0004
<b>Total</b>	<b>2.951E-04</b>	<b>0.7736</b>	<b>1.227E-08</b>	<b>0.0000</b>	<b>7.923E-05</b>	<b>0.2077</b>	<b>0.000E+00</b>	<b>0.0000</b>	<b>0.000E+00</b>	<b>0.0000</b>	<b>7.138E-06</b>	<b>0.0187</b>

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)  
and Fraction of Total Risk at t = 1.000E+03 years

## Water Dependent Pathways

	Water		Fish		Plant		Meat		Milk		All Pathways**	
Radio-Nuclide	risk	fract.	risk	fract.								
Ac-227	0.000E+00	0.0000	2.234E-06	0.0059								
Pa-231	0.000E+00	0.0000	3.847E-07	0.0010								
Pb-210	0.000E+00	0.0000	3.291E-05	0.0863								
Ra-226	0.000E+00	0.0000	1.717E-04	0.4501								
Ra-228	0.000E+00	0.0000	8.326E-05	0.2182								
Th-228	0.000E+00	0.0000	8.847E-05	0.2319								
Th-230	0.000E+00	0.0000	5.459E-07	0.0014								
Th-232	0.000E+00	0.0000	2.467E-07	0.0006								
U-234	0.000E+00	0.0000	2.182E-07	0.0006								
U-235	0.000E+00	0.0000	1.237E-07	0.0003								
U-238	0.000E+00	0.0000	1.409E-06	0.0037								
Total	0.000E+00	0.0000	3.815E-04	1.0000								

\*\* Sum of water independent ground, inhalation, plant, meat, milk, soil and water dependent water, fish, plant, meat, milk pathways

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Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of  
Radon and its Decay Products at t = 1.000E+03 years  
Radionuclides

Radionuclides								
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00							
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.C00E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.C00E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent      Water-dep. == Water-dependent

Radio-Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.757E-21	0.0000	7.691E-25	0.0000	0.000E+00	0.0000	9.278E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.970E-23	0.0000
Pa-231	2.213E-06	0.0058	1.081E-09	0.0000	0.000E+00	0.0000	2.590E-07	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	1.372E-07	0.0004
Pb-210	2.124E-21	0.0000	2.138E-23	0.0000	0.000E+00	0.0000	8.171E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.585E-20	0.0000
Ra-226	8.661E-05	0.2270	8.134E-10	0.0000	0.000E+00	0.0000	2.720E-05	0.0713	0.000E+00	0.0000	0.000E+00	0.0000	2.282E-06	0.0060
Ra-228	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
Th-228	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
Th-230	6.639E-05	0.1740	3.039E-09	0.0000	0.000E+00	0.0000	2.036E-05	0.0534	0.000E+00	0.0000	0.000E+00	0.0000	2.043E-06	0.0054
Th-232	1.385E-04	0.3629	6.670E-09	0.0000	0.000E+00	0.0000	3.108E-05	0.0815	0.000E+00	0.0000	0.000E+00	0.0000	2.429E-06	0.0064
U-234	2.056E-07	0.0005	3.635E-10	0.0000	0.000E+00	0.0000	1.745E-07	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	1.084E-07	0.0003
U-235	1.259E-07	0.0003	1.019E-11	0.0000	0.000E+00	0.0000	3.352E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.728E-09	0.0000
U-238	1.131E-06	0.0030	2.889E-10	0.0000	0.000E+00	0.0000	1.435E-07	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	1.358E-07	0.0004
Total	2.951E-04	0.7736	1.227E-08	0.0000	0.000E+00	0.0000	7.923E-05	0.2077	0.000E+00	0.0000	0.000E+00	0.0000	7.138E-06	0.0187

RESRAD, Version 6.5      T<sub>1/2</sub> Limit = 180 days      11/05/2013      15:16      Page 36  
 Intrisk : DT-15 Accessible Soil Resident  
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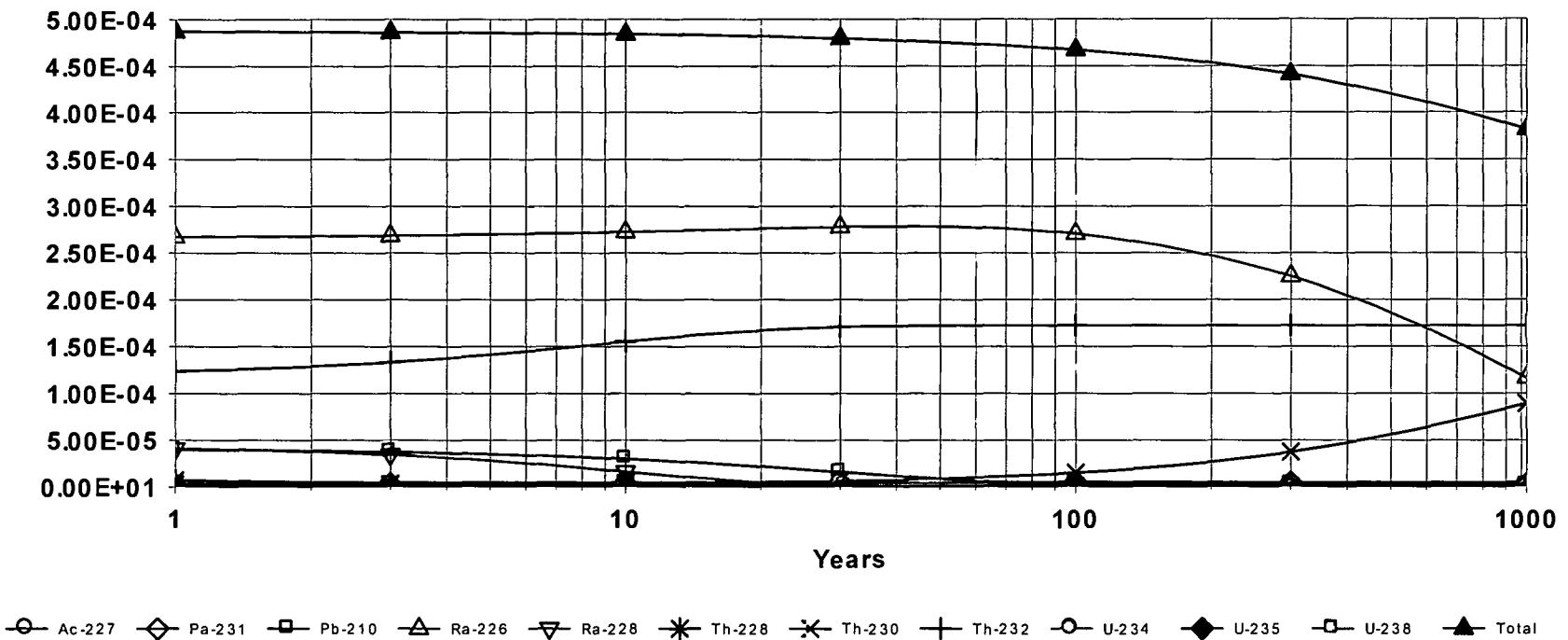
Total Excess Cancer Risk CNRS(i,p,t)\*\*\* for Initially Existent Radionuclides (i) and Pathways (p)  
 and Fraction of Total Risk at t= 1.000E+03 years

#### Water Dependent Pathways

Radio-Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.										
Ac-227	0.000E+00	0.0000	1.940E-21	0.0000										
Pa-231	0.000E+00	0.0000	2.610E-06	0.0068										
Pb-210	0.000E+00	0.0000	9.051E-19	0.0000										
Ra-226	0.000E+00	0.0000	1.161E-04	0.3043										
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000										
Th-228	0.000E+00	0.0000	0.000E+00	0.0000										
Th-230	0.000E+00	0.0000	0.000E+00	0.0000										
Th-232	0.000E+00	0.0000	8.880E-05	0.2328										
U-234	0.000E+00	0.0000	1.720E-04	0.4508										
U-235	0.000E+00	0.0000	4.889E-07	0.0013										
U-238	0.000E+00	0.0000	1.320E-07	0.0003										
Total	0.000E+00	0.0000	1.410E-06	0.0037										
													3.815E-04	1.0000

\*\*\*CNRSI(i,p,t) includes contribution from decay daughter radionuclides

### EXCESS CANCER RISK: All Nuclides Summed, All Pathways Summed



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**AR-256**