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RADIATION PROTECTION

ICRP PUBLICATION 72

Age-dependent Doses to Members of the Public from Intake of Radionuclides: Part 5. Compilation of Ingestion and Inhalation Dose Coefficients

ADOPTED BY THE COMMISSION IN SEPTEMBER 1995

U.S. NUCLEAR REGULATORY COMMISSION
In the Matter of Louisiana Energy Services
Docket No. 70-3103-ML Official Exhibit No. LES 116
OFFERED by: Applicant/Licensee Intervenor
NRC Staff Other
IDENTIFIED on: 12/21/05 Witness/Panel: Dispersal
Action Taken: ADMITTED REJECTED WITHDRAWN
Reporter/Clerk: Britain

LES Exhibit 116

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ANNEXE A. DOSE COEFFICIENTS FOR INGESTION AND INHALATION OF RADIONUCLIDES AND EFFECTIVE DOSE RATES FOR EXPOSURE TO INERT GASES

Table A.1. Ingestion dose coefficients, $e(\tau)$, to age 70 y (Sv Bq^{-1})

		f_1	$e(\tau)$	c_1	$e(\tau)$				
Nuclide	Physical half-life	city	3 months	city	1 Year	5 Years	10 Years	15 Years	Adult
Hydrogen[a]									
Tritiated water	12.3 y	1.000	6.4E-11	1.000	4.8E-11	3.3E-11	2.2E-11	1.8E-11	1.8E-11
OBT	12.3 y	1.000	1.2E-10	1.000	1.2E-10	7.3E-11	5.7E-11	4.2E-11	4.2E-11
Beryllium									
Be-7	53.3 d	0.020	1.0E-10	0.005	1.7E-10	7.7E-11	5.3E-11	3.5E-11	2.8E-11
Be-10	1.6E+06 y	0.020	1.4E-09	0.005	2.2E-09	8.7E-10	2.6E-09	2.6E-09	2.1E-09
Carbon[a]									
C-11	7.340 s	1.000	2.6E-10	1.000	1.5E-10	1.3E-11	6.3E-12	3.9E-12	2.6E-12
C-14	5.73E+03 y	1.000	1.6E-09	1.000	1.0E-09	5.8E-10	5.8E-10	5.7E-10	5.8E-10
Fluorine									
F-18	1.83 h	1.000	5.2E-10	1.000	3.0E-10	1.5E-10	9.1E-11	6.2E-11	4.7E-11
Sodium									
Na-22	2.60 y	1.000	2.1E-08	1.000	1.3E-08	8.6E-09	5.9E-09	3.7E-09	3.2E-09
Na-24	15.0 h	1.000	3.3E-09	1.000	2.3E-09	1.2E-09	7.7E-10	5.2E-10	4.2E-10
Magnesium									
Mg-28	20.9 h	1.000	1.2E-09	0.500	8.0E-09	7.0E-09	4.5E-09	2.7E-09	2.2E-09
Aluminium									
Al-26	7.16E+05 y	0.020	3.6E-09	0.010	2.3E-08	1.1E-08	1.1E-08	6.3E-09	3.3E-09
Silicon									
Si-31	2.62 h	0.020	1.3E-09	0.010	1.0E-08	5.1E-10	3.0E-10	1.9E-10	1.4E-10
Si-32	6.50E+02 y	0.020	7.3E-09	0.010	6.1E-09	2.0E-09	1.2E-09	7.0E-10	5.6E-10
Phosphorus									
P-32	14.3 d	1.000	2.2E-08	0.800	1.9E-08	9.6E-09	5.3E-09	3.1E-09	2.4E-09
P-33	25.4 d	1.000	1.7E-09	0.800	1.0E-09	5.1E-10	3.3E-10	1.8E-10	1.8E-10
Sulphur[a]									
S-35 (inorganic)	87.4 d	1.000	1.2E-09	1.000	8.7E-10	4.8E-10	2.7E-10	1.8E-10	1.3E-10
S-35 (organic)	87.4 d	1.000	7.7E-09	1.000	5.4E-09	2.7E-09	1.8E-09	9.5E-10	7.7E-10

[a] Dose coefficients for radioisotopes of this element are based on age-specific biokinetic data

Table A.1.—(continued)

Nuclide	Physical half-life	f_1 <1y	e(τ) 3 months	f_1 ≥1y	e(τ) 1 Year	5 Years	10 Years	15 Years	Adult
Th-230	7.70E+04 y	0.005	4.1E-06	5.0E-04	4.1E-07	3.1E-07	2.4E-07	2.2E-07	2.1E-07
Th-231	1.06 d	0.005	3.9E-09	5.0E-04	2.5E-09	1.2E-09	7.4E-10	4.2E-10	3.4E-10
Th-232	1.41E+10 y	0.005	4.6E-06	5.0E-04	4.5E-07	3.5E-07	2.9E-07	2.5E-07	2.3E-07
Th-234	24.1 d	0.005	4.2E-08	5.0E-04	2.5E-08	1.3E-08	7.4E-09	4.2E-09	3.4E-09
Protactinium									
Pa-227	0.638 h	0.005	5.8E-10	5.0E-04	3.2E-10	1.5E-10	8.7E-11	5.8E-11	4.5E-11
Pa-228	22.0 h	0.005	1.2E-09	5.0E-04	4.8E-10	2.6E-10	1.6E-10	9.7E-11	7.8E-11
Pa-230	17.4 d	0.005	2.6E-09	5.0E-04	5.7E-09	3.1E-09	1.9E-09	1.1E-09	9.2E-10
Pa-231	3.27E+04 y	0.005	3.3E-05	5.0E-04	1.3E-06	1.1E-06	9.2E-07	8.0E-07	7.1E-07
Pa-232	1.31 d	0.005	6.3E-09	5.0E-04	4.2E-09	2.2E-09	1.4E-09	8.9E-10	7.2E-10
Pa-233	27.0 d	0.005	9.7E-09	5.0E-04	6.2E-09	3.2E-09	1.9E-09	1.2E-09	8.7E-10
Pa-234	6.70 h	0.005	5.0E-09	5.0E-04	3.2E-09	1.7E-09	1.0E-09	6.4E-10	5.1E-10
Uranium[a]									
U-230	20.8 d	0.040	7.9E-07	0.020	3.0E-07	1.5E-07	1.0E-07	6.6E-08	5.6E-08
U-231	4.2 d	0.040	3.1E-09	0.020	2.3E-09	1.0E-09	6.1E-10	3.5E-10	2.8E-10
U-232	72.0 y	0.040	2.5E-06	0.020	8.2E-07	5.8E-07	5.7E-07	6.4E-07	3.3E-07
U-233	1.58E+05 y	0.040	3.8E-07	0.020	1.4E-07	9.2E-08	7.8E-08	7.8E-08	5.1E-08
U-234	2.44E+05 y	0.040	3.7E-07	0.020	1.3E-07	8.8E-08	7.4E-08	7.4E-08	4.9E-08
U-235	7.04E+08 y	0.040	3.5E-07	0.020	1.3E-07	8.5E-08	7.1E-08	7.0E-08	4.7E-08
U-236	2.34E+07 y	0.040	3.5E-07	0.020	1.3E-07	8.4E-08	7.0E-08	7.0E-08	4.7E-08
U-237	6.75 d	0.040	8.3E-09	0.020	5.4E-09	2.8E-09	1.6E-09	9.5E-10	7.6E-10
U-238	4.47E+09 y	0.040	3.4E-07	0.020	1.2E-07	8.0E-08	6.8E-08	6.7E-08	4.5E-08
U-239	0.392 h	0.040	3.4E-10	0.020	1.9E-10	9.3E-11	5.4E-11	3.5E-11	2.7E-11
U-240	14.1 h	0.040	1.3E-08	0.020	8.1E-09	4.1E-09	2.4E-09	1.4E-09	1.1E-09
Neptunium[a]									
Np-232	0.245 h	0.005	8.7E-11	5.0E-04	5.1E-11	2.7E-11	1.7E-11	1.2E-11	9.7E-12
Np-233	0.603 h	0.005	2.1E-11	5.0E-04	1.3E-11	6.6E-12	4.0E-12	2.8E-12	2.2E-12
Np-234	4.40 d	0.005	6.2E-09	5.0E-04	4.4E-09	2.4E-09	1.6E-09	1.0E-09	8.1E-10
Np-235	1.08 y	0.005	7.1E-10	5.0E-04	4.1E-10	2.0E-10	1.2E-10	6.8E-11	5.3E-11
Np-236	1.15E+05 y	0.005	1.9E-07	5.0E-04	2.4E-08	1.8E-08	1.8E-08	1.8E-08	1.7E-08

a Dose coefficients for this element are based on age-specific biokinetic data

Table A.1.—(continued)

Nuclide	Physical half-life	f_1 <1y	e(τ) 3 months	f_1 ≥1y	e(τ) 1 Year	5 Years	10 Years	15 Years	Adult
Np-236	22.5 h	0.005	2.5E-09	5.0E-04	1.3E-09	6.6E-10	4.0E-10	2.4E-10	1.9E-10
Np-237	2.14E+06 y	0.005	2.0E-06	5.0E-04	2.1E-07	1.4E-07	1.1E-07	1.1E-07	1.1E-07
Np-238	2.12 d	0.005	9.5E-09	5.0E-04	6.2E-09	3.2E-09	1.9E-09	1.1E-09	9.1E-10
Np-239	2.36 d	0.005	8.9E-09	5.0E-04	5.7E-09	2.9E-09	1.7E-09	1.0E-09	8.0E-10
Np-240	1.08 h	0.005	8.7E-10	5.0E-04	5.2E-10	2.6E-10	1.6E-10	1.0E-10	8.2E-11
Plutonium[a]									
Pu-234	8.80 h	0.005	2.1E-09	5.0E-04	1.1E-09	5.5E-10	3.3E-10	2.0E-10	1.6E-10
Pu-235	0.422 h	0.005	2.2E-11	5.0E-04	1.3E-11	6.5E-12	3.9E-12	2.7E-12	2.1E-12
Pu-236	2.85 y	0.005	2.1E-06	5.0E-04	2.2E-07	1.4E-07	1.0E-07	8.5E-08	8.7E-08
Pu-237	45.3 d	0.005	1.1E-09	5.0E-04	6.9E-10	3.6E-10	2.2E-10	1.3E-10	1.0E-10
Pu-238	87.7 y	0.005	4.0E-06	5.0E-04	4.0E-07	3.1E-07	2.4E-07	2.2E-07	2.3E-07
Pu-239	2.41E+04 y	0.005	4.2E-06	5.0E-04	4.2E-07	3.3E-07	2.7E-07	2.4E-07	2.5E-07
Pu-240	6.54E+03 y	0.005	4.2E-06	5.0E-04	4.2E-07	3.3E-07	2.7E-07	2.4E-07	2.5E-07
Pu-241	14.4 y	0.005	5.6E-08	5.0E-04	5.7E-09	5.5E-09	5.1E-09	4.8E-09	4.8E-09
Pu-242	3.76E+05 y	0.005	4.0E-06	5.0E-04	4.0E-07	3.2E-07	2.6E-07	2.3E-07	2.4E-07
Pu-243	4.95 h	0.005	1.0E-09	5.0E-04	6.2E-10	3.1E-10	1.8E-10	1.1E-10	8.5E-11
Pu-244	8.26E+07 y	0.005	4.0E-06	5.0E-04	4.1E-07	3.2E-07	2.6E-07	2.3E-07	2.4E-07
Pu-245	10.5 h	0.005	8.0E-09	5.0E-04	5.1E-09	2.6E-09	1.5E-09	8.9E-10	7.2E-10
Pu-246	10.9 d	0.005	3.6E-08	5.0E-04	2.3E-08	1.2E-08	7.1E-09	4.1E-09	3.3E-09
Americium[a]									
Am-237	1.22 h	0.005	1.7E-10	5.0E-04	1.0E-10	5.5E-11	3.3E-11	2.2E-11	1.8E-11
Am-238	1.63 h	0.005	2.5E-10	5.0E-04	1.6E-10	9.1E-11	5.9E-11	4.0E-11	3.2E-11
Am-239	11.9 h	0.005	2.6E-09	5.0E-04	1.7E-09	8.4E-10	5.1E-10	3.0E-10	2.4E-10
Am-240	2.12 d	0.005	4.7E-09	5.0E-04	3.3E-09	1.8E-09	1.2E-09	7.3E-10	5.8E-10
Am-241	4.32E+02 y	0.005	3.7E-06	5.0E-04	3.7E-07	2.7E-07	2.2E-07	2.0E-07	2.0E-07
Am-242	16.0 h	0.005	5.0E-09	5.0E-04	2.2E-09	1.1E-09	6.4E-10	3.7E-10	3.0E-10
Am-242m	1.52E+02 y	0.005	3.1E-06	5.0E-04	3.0E-07	2.3E-07	2.0E-07	1.9E-07	1.9E-07
Am-243	7.38E+03 y	0.005	3.6E-06	5.0E-04	3.7E-07	2.7E-07	2.2E-07	2.0E-07	2.0E-07
Am-244	10.1 h	0.005	4.9E-09	5.0E-04	3.1E-09	1.6E-09	9.6E-10	5.8E-10	4.6E-10
Am-244m	0.433 h	0.005	3.7E-10	5.0E-04	2.0E-10	9.6E-11	5.8E-11	3.7E-11	2.9E-11

a Dose coefficients for this element are based on age-specific biokinetic data

Table A.2. Inhalation dose coefficients, e(τ), to age 70 y (Sv Bq^{-1})

Nuclide	Physical half-life	Type	f_1	e(τ)	f_1	e(τ)				
			<1y	3 months	≥1y	1 Year	5 Years	10 Years	15 Years	Adult
Hydrogen[a]										
Tritium compounds	12.3 y	F	1.000	2.6E-11	1.000	2.0E-11	1.1E-11	8.2E-12	5.9E-12	6.2E-12
		M	0.200	3.4E-10	0.100	2.7E-10	1.4E-10	8.2E-11	5.3E-11	6.5E-11
		S	0.020	1.2E-09	0.010	1.0E-09	5.3E-10	3.0E-10	2.0E-10	2.3E-10
Beryllium										
Be-7	53.3 d	M	0.020	2.6E-10	0.005	2.2E-10	1.2E-10	8.7E-11	6.2E-11	5.8E-11
		S	0.020	2.8E-10	0.005	2.4E-10	1.4E-10	9.6E-11	6.8E-11	5.5E-11
Be-10	1.6E+06 y	M	0.020	4.1E-08	0.005	3.4E-08	2.0E-08	1.3E-08	1.1E-08	9.8E-09
		S	0.002	9.9E-08	0.005	9.2E-08	6.1E-08	4.2E-08	3.7E-08	3.5E-08
Carbon[a]										
C-11	0.340 h	F	1.000	1.0E-10	1.000	7.0E-11	3.2E-11	2.1E-11	1.5E-11	1.1E-11
		M	0.200	1.5E-10	0.100	1.1E-10	4.9E-11	3.2E-11	2.1E-11	1.5E-11
		S	0.020	1.5E-10	0.010	1.3E-10	5.1E-11	3.3E-11	2.2E-11	1.8E-11
C-14	5.73E+03 y	F	1.000	6.1E-10	1.000	5.1E-10	3.6E-10	2.8E-10	1.9E-10	2.0E-10
		M	0.200	8.3E-09	0.100	6.9E-09	4.8E-09	3.8E-09	2.5E-09	2.8E-09
		S	0.020	1.4E-08	0.010	1.2E-08	7.8E-09	6.0E-09	4.0E-09	5.6E-09
Fluorine										
F-18	1.83 h	F	1.000	2.9E-10	1.000	1.9E-10	9.2E-11	5.6E-11	3.6E-11	2.8E-11
		M	1.000	4.1E-10	1.000	2.9E-10	1.3E-10	9.7E-11	6.8E-11	5.4E-11
		S	1.000	4.2E-10	1.000	3.1E-10	1.5E-10	1.0E-10	7.3E-11	5.9E-11
Sodium										
Na-22	2.60 y	F	1.000	9.7E-09	1.000	7.3E-09	3.9E-09	2.6E-09	1.9E-09	2.3E-09
Na-24	15.0 h	F	1.000	2.3E-09	1.000	1.8E-09	9.2E-10	6.7E-10	3.6E-10	2.7E-10
Magnesium										
Mg-28	20.9 h	F	1.000	5.3E-09	0.500	4.7E-09	2.2E-09	1.3E-09	7.3E-10	6.0E-10
		M	1.000	7.3E-09	0.500	7.2E-09	3.5E-09	2.1E-09	1.6E-09	1.2E-09
Aluminium										
Al-26	7.16E+05 y	F	0.020	8.1E-09	0.010	6.2E-09	3.2E-09	2.0E-09	1.3E-09	1.1E-09
		M	0.020	8.9E-09	0.010	7.0E-09	4.6E-09	2.5E-09	2.2E-09	2.0E-09
Silicon										
Si-31	2.62 h	F	0.020	1.5E-09	0.010	2.3E-10	9.3E-11	5.8E-11	3.2E-11	2.7E-11
		M	0.020	6.9E-10	0.010	4.6E-10	2.0E-10	1.1E-10	6.9E-11	7.4E-11
		S	0.020	7.2E-10	0.010	4.7E-10	2.2E-10	1.4E-10	9.3E-11	7.9E-11
Si-32	4.5E+02 y	F	0.020	3.0E-08	0.010	2.2E-08	1.2E-08	8.4E-09	3.8E-09	3.2E-09
		M	0.020	7.1E-08	0.010	6.0E-08	3.6E-08	2.6E-08	1.3E-08	1.1E-08
		S	0.020	2.6E-07	0.010	2.7E-07	1.5E-07	1.1E-07	1.1E-07	1.1E-07
Phosphorus										
P-32	14.3 d	F	1.000	1.2E-09	0.800	7.3E-09	3.3E-09	1.8E-09	9.8E-10	7.7E-10
		M	1.000	2.2E-09	0.800	1.5E-08	6.6E-09	3.3E-09	1.8E-09	1.5E-09
P-33	25.4 d	F	1.000	1.2E-09	0.800	7.8E-10	3.9E-10	2.0E-10	1.1E-10	9.2E-11
		M	1.000	1.1E-09	0.800	8.1E-09	3.8E-09	2.1E-09	1.3E-09	1.5E-09

[a] Dose coefficients for radioisotopes of this element are based on age-specific biokinetic data

Table A.2.—(continued)

Nuclide	Physical half-life	Type	f_1	e(τ)	f_1	e(τ)				
			<1y	3 months	≥1y	1 Year	5 Years	10 Years	15 Years	Adult
Sulphur[a]										
S-35 (inorganic)	87.4 d	F	1.000	5.5E-10	0.800	3.9E-10	1.8E-10	1.1E-10	6.8E-11	5.2E-11
		M	0.200	5.9E-09	0.100	4.5E-09	2.1E-09	1.2E-09	1.0E-09	1.0E-09
		S	0.020	7.5E-09	0.010	6.0E-09	3.1E-09	2.0E-09	1.5E-09	1.3E-09
Chlorine										
Cl-36	3.0E+05 y	F	1.000	3.9E-09	1.000	2.6E-09	1.3E-09	7.1E-10	1.9E-10	3.3E-10
		M	1.000	3.1E-08	1.000	2.6E-08	1.5E-08	1.0E-08	9.0E-09	7.3E-09
Cl-38	0.620 h	F	1.000	2.0E-10	1.000	1.3E-10	8.0E-11	5.1E-11	3.0E-11	2.5E-11
		M	1.000	4.3E-10	1.000	3.0E-10	1.7E-10	8.5E-11	5.6E-11	5.0E-11
Cl-39	0.927 h	F	1.000	2.7E-10	1.000	1.8E-10	9.6E-11	5.1E-11	3.1E-11	2.5E-11
		M	1.000	4.3E-10	1.000	2.9E-10	1.3E-10	8.5E-11	5.6E-11	4.6E-11
Potassium										
K-40	1.3E+09 y	F	1.000	2.4E-08	1.000	1.3E-08	7.5E-09	4.5E-09	2.9E-09	2.1E-09
K-42	12.4 h	F	1.000	1.6E-09	1.000	1.0E-09	4.4E-10	2.6E-10	1.9E-10	1.2E-10
K-43	22.6 h	F	1.000	1.3E-09	1.000	9.1E-10	4.1E-10	2.4E-10	1.7E-10	1.4E-10
K-44	0.369 h	F	1.000	2.2E-10	1.000	1.6E-10	6.9E-11	4.0E-11	2.6E-11	2.0E-11
K-45	0.333 h	F	1.000	1.5E-10	1.000	1.0E-10	4.9E-11	3.0E-11	1.8E-11	1.5E-11
Calcium[a,b]										
Ca-41	1.4E+05 y	F	0.600	6.7E-10	0.300	3.0E-10	2.0E-10	1.3E-10	1.3E-10	1.7E-10
		M	0.200	4.2E-10	0.100	2.0E-10	1.2E-10	7.7E-11	7.7E-11	9.5E-11
		S	0.020	8.7E-10	0.010	4.0E-10	2.4E-10	1.6E-10	1.6E-10	2.0E-10
Ca-45	163 d	F	0.600	5.7E-09	0.300	2.0E-09	1.4E-09	1.0E-09	1.0E-09	1.0E-09
		M	0.200	1.7E-08	0.100	6.0E-09	3.1E-09	2.0E-09	2.0E-09	2.7E-09
		S	0.020	1.5E-08	0.010	1.2E-08	7.2E-09	5.1E-09	4.6E-09	3.7E-09
Ca-47	4.53 d	F	0.600	4.9E-09	0.300	3.0E-09	1.7E-09	1.1E-09	8.1E-10	5.5E-10
		M	0.200	1.8E-08	0.100	7.7E-09	4.2E-09	2.9E-09	2.4E-09	1.9E-09
		S	0.020	1.2E-08	0.010	6.3E-09	4.3E-09	3.3E-09	2.6E-09	2.0E-09
Scandium										
Sc-43	3.89 h	S	0.001	9.3E-10	1.0E-04	6.7E-10	3.3E-10	2.2E-10	1.4E-10	1.1E-10
Sc-44	3.93 h	S	0.001	1.6E-09	1.0E-04	1.2E-09	5.6E-10	3.6E-10	2.3E-10	1.8E-10
Sc-44m	2.44 d	S	0.001	1.1E-08	1.0E-04	8.4E-09	4.2E-09	2.9E-09	1.7E-09	1.4E-09
Sc-46	83.8 d	S	0.001	2.0E-08	1.0E-04	2.3E-08	1.1E-08	9.0E-09	8.4E-09	6.8E-09
Sc-47	3.35 d	S	0.001	4.0E-09	1.0E-04	2.8E-09	1.5E-09	1.1E-09	9.2E-10	7.3E-10
Sc-48	1.82 d	S	0.001	7.0E-09	1.0E-04	5.3E-09	2.1E-09	2.0E-09	1.4E-09	1.2E-09
Sc-49	0.956 h	S	0.001	3.9E-10	1.0E-04	2.6E-10	1.1E-10	7.2E-11	4.7E-11	4.0E-11
Titanium										
Ti-44	47.3 y	F	0.020	3.1E-07	0.010	2.0E-07	1.5E-07	8.8E-08	6.8E-08	6.2E-08
		M	0.020	1.7E-07	0.010	1.5E-07	9.3E-08	5.8E-08	4.6E-08	4.2E-08
		S	0.020	3.7E-07	0.010	3.2E-07	2.1E-07	1.5E-07	1.3E-07	1.2E-07

[a] Dose coefficients for this element are based on age-specific biokinetic data

[b] The f_1 value for 1 to 15 year olds for type F is 0.4

[redacted]

Table A.2—(continued)

Nuclide	Physical half-life	Type	f_1 <1y	e(τ) 3 Months	f_1 ≥1y	e(τ) 1 Year	5 Years	10 Years	15 Years	Adult
Thorium[a]										
Th-226	0.515 h	F	0.005	1.4E-07	5.0E-04	1.6E-07	4.3E-08	3.4E-08	2.5E-08	2.2E-08
		M	0.005	3.8E-07	5.0E-04	2.1E-07	1.1E-07	8.3E-08	7.0E-08	5.8E-08
		S	0.005	3.1E-07	5.0E-04	2.2E-07	1.2E-07	8.1E-08	7.3E-08	6.1E-08
Th-227	18.7 d	F	0.005	8.4E-05	5.0E-04	5.2E-05	2.9E-05	1.6E-05	1.0E-05	4.7E-07
		M	0.005	3.2E-05	5.0E-04	2.5E-05	1.9E-05	1.1E-05	1.1E-05	8.5E-06
		S	0.005	3.9E-05	5.0E-04	3.0E-05	2.1E-05	1.4E-05	1.3E-05	1.0E-05
Th-228	1.91 y	F	0.005	1.8E-04	5.0E-04	1.5E-04	8.3E-05	5.2E-05	3.6E-05	2.9E-05
		M	0.005	1.3E-04	5.0E-04	1.1E-04	6.8E-05	4.6E-05	3.9E-05	3.2E-05
		S	0.005	1.6E-04	5.0E-04	1.3E-04	9.2E-05	5.5E-05	4.7E-05	4.0E-05
Th-229	7.34E+03 y	F	0.005	3.4E-04	5.0E-04	3.1E-04	3.0E-04	2.9E-04	2.4E-04	2.4E-04
		M	0.005	2.3E-04	5.0E-04	2.1E-04	1.6E-04	1.2E-04	1.1E-04	1.1E-04
		S	0.005	2.1E-04	5.9E-04	1.9E-04	1.3E-04	8.7E-05	7.6E-05	7.1E-05
Th-230	7.70E+04 y	F	0.005	2.1E-04	5.0E-04	2.0E-04	1.4E-04	1.1E-04	9.9E-05	1.0E-04
		M	0.005	7.7E-05	5.0E-04	7.4E-05	5.5E-05	4.3E-05	4.2E-05	4.3E-05
		S	0.005	4.0E-05	5.0E-04	3.5E-05	2.4E-05	1.6E-05	1.5E-05	1.4E-05
Th-231	1.06 d	F	0.005	1.1E-09	5.0E-04	7.2E-10	2.4E-10	1.4E-10	9.2E-11	7.8E-11
		M	0.005	2.2E-09	5.0E-04	1.6E-09	8.4E-10	4.6E-10	3.8E-10	3.1E-10
		S	0.005	2.4E-09	5.0E-04	1.7E-09	7.4E-10	5.3E-10	4.2E-10	3.3E-10
Th-232	1.40E+10 y	F	0.005	2.3E-04	5.0E-04	2.2E-04	1.6E-04	1.3E-04	1.2E-04	1.1E-04
		M	0.005	8.3E-05	5.0E-04	8.1E-05	6.3E-05	5.0E-05	4.7E-05	4.5E-05
		S	0.005	5.4E-05	5.0E-04	5.0E-05	3.7E-05	2.6E-05	2.5E-05	2.5E-05
Th-234	24.1 d	F	0.005	4.0E-08	5.0E-04	2.5E-08	1.1E-08	6.1E-09	3.6E-09	2.5E-09
		M	0.005	3.9E-08	5.0E-04	2.9E-08	1.5E-08	1.0E-08	7.9E-09	6.6E-09
		S	0.005	4.1E-08	5.0E-04	3.1E-08	1.7E-08	1.1E-08	9.1E-09	7.7E-09
Protactinium										
Pa-227	0.638 h	M	0.005	3.4E-07	5.0E-04	2.6E-07	1.4E-07	1.0E-07	9.0E-08	7.6E-08
		S	0.005	3.8E-07	5.0E-04	2.8E-07	1.5E-07	1.1E-07	9.3E-08	8.0E-08
Pa-228	22.0 h	M	0.005	2.6E-07	5.0E-04	2.1E-07	1.3E-07	8.8E-08	7.7E-08	6.4E-08
		S	0.005	2.9E-07	5.0E-04	2.4E-07	1.5E-07	1.0E-07	8.3E-08	7.5E-08
Pa-230	17.4 d	M	0.005	2.6E-06	5.0E-04	2.0E-06	1.3E-06	8.3E-07	7.0E-07	6.1E-07
		S	0.005	2.9E-06	5.0E-04	2.2E-06	1.4E-06	1.0E-06	9.6E-07	7.6E-07
Pa-231	3.27E+04 y	M	0.005	2.2E-04	5.0E-04	2.3E-04	1.9E-04	1.5E-04	1.5E-04	1.4E-04
		S	0.005	7.4E-05	5.0E-04	6.9E-05	5.2E-05	3.9E-05	3.6E-05	3.4E-05
Pa-232	1.31 d	M	0.005	1.9E-08	5.0E-04	1.0E-08	1.0E-08	1.2E-08	1.2E-08	1.0E-08
		S	0.005	1.0E-08	5.0E-04	8.7E-09	5.9E-09	4.1E-09	3.7E-09	3.3E-09
Pa-233	27.0 d	M	0.005	1.5E-08	5.0E-04	1.1E-08	6.5E-09	4.7E-09	4.3E-09	3.3E-09
		S	0.005	1.7E-08	5.0E-04	1.3E-08	7.5E-09	5.5E-09	4.9E-09	3.9E-09
Pa-234	6.70 h	M	0.005	2.0E-09	5.0E-04	2.0E-09	1.0E-09	6.8E-10	4.7E-10	3.8E-10
		S	0.005	2.5E-09	5.0E-04	2.1E-09	1.1E-09	7.1E-10	5.6E-10	4.0E-10
Uranium[a]										
U-230	20.8 d	F	0.040	3.2E-06	0.020	1.5E-06	7.2E-07	5.0E-07	4.3E-07	3.6E-07
		M	0.040	4.9E-05	0.020	3.7E-05	2.4E-05	1.6E-05	1.7E-05	1.3E-05
		S	0.020	5.8E-05	0.002	4.6E-05	2.8E-05	2.1E-05	2.0E-05	1.6E-05
U-231	4.20 d	F	0.040	8.9E-10	0.020	6.2E-10	3.1E-10	1.4E-10	1.0E-10	6.2E-11
		M	0.040	2.6E-09	0.020	1.7E-09	9.4E-10	5.5E-10	4.6E-10	3.8E-10
		S	0.020	2.6E-09	0.002	1.9E-09	9.8E-10	6.1E-10	4.9E-10	4.0E-10

a Dose coefficients for this element are based on age-specific biokinetic data

Table A.2—(continued)

Nuclide	Physical half-life	Type	f_1 <1y	e(τ) 3 Months	f_1 ≥1y	e(τ) 1 Year	5 Years	10 Years	15 Years	Adult
U-232	72.0 y	F	0.040	1.4E-05	0.020	1.1E-05	5.9E-06	5.6E-06	7.5E-06	4.0E-06
		M	0.040	3.0E-05	0.020	2.4E-05	1.6E-05	1.1E-05	1.0E-05	7.8E-06
		S	0.020	1.0E-04	0.002	9.7E-05	6.6E-05	4.3E-05	3.8E-05	3.7E-05
U-233	1.58E+05 y	F	0.040	2.2E-06	0.020	1.4E-06	9.4E-07	8.4E-07	8.6E-07	5.8E-07
		M	0.040	1.5E-05	0.020	1.1E-05	7.2E-06	4.9E-06	4.3E-06	3.6E-06
		S	0.020	3.4E-05	0.002	3.0E-05	1.9E-05	1.2E-05	1.1E-05	9.6E-06
U-234	2.44E+05 y	F	0.040	2.1E-06	0.020	1.4E-06	9.0E-07	8.0E-07	8.2E-07	5.6E-07
		M	0.040	1.5E-05	0.020	1.1E-05	7.0E-06	4.8E-06	4.2E-06	3.5E-06
		S	0.020	3.3E-05	0.002	2.9E-05	1.9E-05	1.2E-05	1.0E-05	9.4E-06
U-235	7.04E+08 y	F	0.040	2.0E-06	0.020	1.3E-06	8.5E-07	7.5E-07	7.7E-07	5.2E-07
		M	0.040	1.3E-05	0.020	1.0E-05	6.3E-06	4.3E-06	3.7E-06	3.1E-06
		S	0.020	3.0E-05	0.002	2.6E-05	1.7E-05	1.1E-05	9.2E-06	8.5E-06
U-236	2.34E+07 y	F	0.040	2.0E-06	0.020	1.3E-06	8.5E-07	7.5E-07	7.8E-07	5.3E-07
		M	0.040	1.4E-05	0.020	1.0E-05	6.5E-06	4.5E-06	3.9E-06	3.2E-06
		S	0.020	3.1E-05	0.002	2.7E-05	1.8E-05	1.1E-05	9.5E-06	8.7E-06
U-237	6.75 d	F	0.040	1.8E-09	0.020	1.3E-09	6.8E-10	4.2E-10	1.9E-10	1.0E-10
		M	0.040	7.8E-09	0.020	5.7E-09	3.3E-09	2.4E-09	2.1E-09	1.7E-09
		S	0.020	8.7E-09	0.002	6.4E-09	3.7E-09	2.7E-09	2.4E-09	1.9E-09
U-238	4.47E+09 y	F	0.040	1.9E-06	0.020	1.3E-06	8.2E-07	7.3E-07	7.4E-07	5.0E-07
		M	0.040	1.2E-05	0.020	9.4E-06	5.9E-06	4.0E-06	3.4E-06	2.9E-06
		S	0.020	2.9E-05	0.002	2.5E-05	1.6E-05	1.0E-05	8.7E-06	8.0E-06
U-239	0.392 h	F	0.040	1.0E-10	0.020	6.8E-11	2.9E-11	2.9E-11	1.2E-11	1.0E-11
		M	0.040	1.8E-10	0.020	1.2E-10	5.8E-11	3.4E-11	2.3E-11	2.2E-11
		S	0.020	1.9E-10	0.002	1.2E-10	5.9E-11	4.0E-11	2.9E-11	2.4E-11
U-240	14.1 h	F	0.040	2.4E-09	0.020	1.8E-09	7.3E-10	4.5E-10	2.3E-10	2.0E-10
		M	0.040	4.6E-09	0.020	3.1E-09	1.7E-09	1.1E-09	6.3E-10	5.3E-10
		S	0.020	4.9E-09	0.002	3.3E-09	1.6E-09	1.1E-09	7.0E-10	5.8E-10
Neptunium[a]										
Np-232	0.245 h	F	0.005	2.0E-10	5.0E-04	1.9E-10	1.2E-10	1.1E-10	1.3E-10	1.2E-10
		M	0.005	8.9E-11	5.0E-04	6.2E-11	5.5E-11	6.5E-11	4.7E-11	5.0E-11
		S	0.005	1.2E-10	5.0E-04	9.7E-11	5.8E-11	3.9E-11	2.3E-11	2.4E-11
Np-233	0.603 h	F	0.005	1.2E-11	5.0E-04	7.7E-12	4.2E-12	2.8E-12	1.4E-12	1.1E-12
		M	0.005	1.5E-11	5.0E-04	1.1E-11	5.5E-12	3.3E-12	2.3E-12	1.6E-12
		S	0.005	1.5E-11	5.0E-04	1.2E-11	5.7E-12	3.4E-12	2.3E-12	1.7E-12
Np-234	4.40 d	F	0.005	2.9E-09	5.0E-04	2.3E-09	1.3E-09	7.2E-10	4.3E-10	3.5E-10
		M	0.005	3.8E-09	5.0E-04	3.0E-09	1.8E-09	1.0E-09	6.5E-10	5.3E-10
		S	0.005	3.9E-09	5.0E-04	3.3E-09	1.6E-09	1.0E-09	6.0E-10	5.5E-10
Np-235	1.08 y	F	0.005	4.2E-09	5.0E-04	3.5E-09	1.9E-09	1.3E-09	7.9E-10	6.3E-10
		M	0.005	2.3E-09	5.0E-04	1.9E-09	1.1E-09	6.8E-10	5.1E-10	4.2E-10
		S	0.005	2.6E-09	5.0E-04	2.2E-09	1.3E-09	8.3E-10	6.3E-10	5.2E-10
Np-236	1.15E+05 y	F	0.005	8.9E-06	5.0E-04	9.1E-06	7.2E-06	7.5E-06	7.9E-06	8.0E-06
		M	0.005	3.0E-06	5.0E-04	3.1E-06	2.7E-06	2.7E-06	3.1E-06	3.2E-06
		S	0.005	1.0E-06	5.0E-04	1.0E-06	1.3E-06	1.0E-06	1.0E-06	1.0E-06
Np-236	22.5 h	F	0.005	2.4E-08	5.0E-04	2.4E-08	1.5E-08	1.3E-08	8.8E-09	9.0E-09
		M	0.005	1.4E-08	5.0E-04	1.4E-08	8.9E-09	6.2E-09	5.0E-09	5.3E-09
		S	0.005	1.4E-08	5.0E-04	1.3E-08	8.5E-09	5.7E-09	4.0E-09	4.2E-09
Np-237	2.14E+06 y	F	0.005	9.8E-05	5.0E-04	9.3E-05	6.0E-05	5.0E-05	4.7E-05	5.0E-05
		M	0.005	4.4E-05	5.0E-04	4.0E-05	2.8E-05	2.2E-05	2.2E-05	2.3E-05
		S	0.005	3.7E-05	5.0E-04	3.2E-05	2.1E-05	1.4E-05	1.3E-05	1.2E-05

a Dose coefficients for this element are based on age-specific biokinetic data

Table A.2.—(continued)

Nuclide	Physical half-life	Type	f_1 <1y	e(t) 3 Months	f_1 ≥1y	e(t) 1 Year	5 Years	10 Years	15 Years	Adult
Np-238	2.12 d	F	0.005	9.8E-09	5.0E-04	7.5E-09	4.0E-09	3.7E-09	3.3E-09	3.5E-09
		M	0.005	7.3E-09	5.0E-04	5.8E-09	3.0E-09	2.8E-09	2.2E-09	2.1E-09
		S	0.005	8.1E-09	5.0E-04	6.2E-09	3.2E-09	2.1E-09	1.7E-09	1.5E-09
Np-239	2.36 d	F	0.005	2.0E-09	5.0E-04	1.4E-09	6.3E-10	3.8E-10	2.1E-10	1.7E-10
		M	0.005	5.9E-09	5.0E-04	4.2E-09	2.6E-09	1.4E-09	1.2E-09	9.3E-10
		S	0.005	5.4E-09	5.0E-04	4.0E-09	2.2E-09	1.4E-09	1.3E-09	1.0E-09
Np-240	1.08 h	F	0.005	3.8E-10	5.0E-04	2.6E-10	1.2E-10	7.3E-11	4.7E-11	4.0E-11
		M	0.005	6.3E-10	5.0E-04	4.4E-10	2.2E-10	1.4E-10	1.0E-10	8.5E-11
		S	0.005	6.5E-10	5.0E-04	4.6E-10	2.3E-10	1.5E-10	1.1E-10	9.0E-11
Plutonium[a]										
Pu-234	8.80 h	F	0.005	3.0E-08	5.0E-04	2.0E-08	9.8E-09	5.7E-09	3.4E-09	3.0E-09
		M	0.005	7.8E-08	5.0E-04	5.9E-08	3.7E-08	2.8E-08	2.4E-08	2.1E-08
		S	1.0E-04	8.7E-08	1.0E-05	6.6E-08	4.2E-08	3.1E-08	3.0E-08	2.4E-08
Pu-235	0.422 h	F	0.005	1.0E-11	5.0E-04	7.9E-12	3.9E-12	2.2E-12	1.3E-12	1.0E-12
		M	0.005	1.3E-11	5.0E-04	1.0E-11	5.0E-12	2.9E-12	1.9E-12	1.4E-12
		S	1.0E-04	1.3E-11	1.0E-05	1.0E-11	5.1E-12	3.0E-12	1.9E-12	1.5E-12
Pu-236	2.85 y	F	0.005	1.0E-04	5.0E-04	9.5E-05	8.3E-05	4.6E-05	3.7E-05	4.0E-05
		M	0.005	4.8E-05	5.0E-04	4.3E-05	2.9E-05	2.3E-05	1.9E-05	2.0E-05
		S	1.0E-04	3.1E-05	1.0E-05	1.5E-05	2.8E-05	1.6E-05	1.2E-05	1.0E-05
Pu-237	45.3 d	F	0.005	2.2E-09	5.0E-04	1.6E-09	7.9E-10	4.8E-10	2.9E-10	2.6E-10
		M	0.005	1.8E-09	5.0E-04	1.4E-09	8.2E-10	5.4E-10	4.3E-10	3.5E-10
		S	1.0E-04	2.0E-09	1.0E-05	1.5E-09	8.8E-10	5.5E-10	4.6E-10	3.9E-10
Pu-238	87.7 y	F	0.005	2.0E-04	5.0E-04	1.9E-04	1.4E-04	1.2E-04	1.0E-04	1.1E-04
		M	0.005	7.8E-05	5.0E-04	7.4E-05	5.6E-05	4.4E-05	4.3E-05	4.6E-05
		S	1.0E-04	4.5E-05	1.0E-05	4.0E-05	2.7E-05	1.8E-05	1.7E-05	1.6E-05
Pu-239	2.41E+04 y	F	0.005	2.1E-04	5.0E-04	2.0E-04	1.5E-04	1.3E-04	1.1E-04	1.2E-04
		M	0.005	8.0E-05	5.0E-04	7.7E-05	6.0E-05	4.8E-05	4.7E-05	5.0E-05
		S	1.0E-04	4.3E-05	1.0E-05	3.9E-05	2.7E-05	1.9E-05	1.7E-05	1.6E-05
Pu-240	6.54E+03 y	F	0.005	2.1E-04	5.0E-04	2.0E-04	1.5E-04	1.2E-04	1.1E-04	1.2E-04
		M	0.005	8.0E-05	5.0E-04	7.7E-05	6.0E-05	4.8E-05	4.7E-05	5.0E-05
		S	1.0E-04	4.3E-05	1.0E-05	3.9E-05	2.7E-05	1.9E-05	1.7E-05	1.6E-05
Pu-241	14.4 y	F	0.005	2.8E-06	5.0E-04	2.9E-06	2.6E-06	2.4E-06	2.2E-06	2.3E-06
		M	0.005	9.1E-07	5.0E-04	9.7E-07	9.2E-07	8.3E-07	8.6E-07	9.0E-07
		S	1.0E-04	2.2E-07	1.0E-05	2.3E-07	2.0E-07	1.7E-07	1.7E-07	1.7E-07
Pu-242	3.76E+05 y	F	0.005	2.0E-04	5.0E-04	1.9E-04	1.4E-04	1.2E-04	1.1E-04	1.1E-04
		M	0.005	7.6E-05	5.0E-04	7.3E-05	5.7E-05	4.5E-05	4.5E-05	4.8E-05
		S	1.0E-04	4.0E-05	1.0E-05	3.6E-05	2.5E-05	1.7E-05	1.6E-05	1.5E-05
Pu-243	4.95 h	F	0.005	2.7E-10	5.0E-04	1.9E-10	8.8E-11	5.7E-11	3.5E-11	3.2E-11
		M	0.005	5.6E-10	5.0E-04	3.9E-10	1.9E-10	1.3E-10	8.7E-11	8.3E-11
		S	1.0E-04	6.0E-10	1.0E-05	4.1E-10	2.0E-10	1.4E-10	9.2E-11	8.6E-11
Pu-244	8.26E+07 y	F	0.005	2.0E-04	5.0E-04	1.9E-04	1.4E-04	1.2E-04	1.1E-04	1.1E-04
		M	0.005	7.6E-05	5.0E-04	7.2E-05	5.6E-05	4.4E-05	4.4E-05	4.7E-05
		S	1.0E-04	3.9E-05	1.0E-05	3.5E-05	2.4E-05	1.7E-05	1.5E-05	1.5E-05
Pu-245	10.5 h	F	0.005	1.8E-09	5.0E-04	1.3E-09	5.8E-10	3.5E-10	1.9E-10	1.6E-10
		M	0.005	3.6E-09	5.0E-04	2.5E-09	1.2E-09	8.0E-10	5.0E-10	4.0E-10
		S	1.0E-04	3.8E-09	1.0E-05	2.6E-09	1.3E-09	8.5E-10	5.4E-10	4.3E-10
Pu-246	10.9 d	F	0.005	2.0E-08	5.0E-04	1.4E-08	7.0E-09	4.0E-09	2.8E-09	2.3E-09
		M	0.005	3.5E-08	5.0E-04	2.6E-08	1.5E-08	1.1E-08	9.1E-09	7.4E-09
		S	1.0E-04	3.8E-08	1.0E-05	2.8E-08	1.6E-08	1.2E-08	1.0E-08	8.0E-09

a Dose coefficients for this element are based on age-specific biokinetic data

Table A.2.—(continued)

Nuclide	Physical half-life	Type	f_1 <1y	e(t) 3 Months	f_1 ≥1y	e(t) 1 Year	5 Years	10 Years	15 Years	Adult
Americium[a]										
Am-237	1.22 h	F	0.005	9.8E-11	5.0E-04	7.3E-11	3.5E-11	2.2E-11	1.3E-11	1.1E-11
		M	0.005	1.7E-10	5.0E-04	1.2E-10	6.2E-11	4.1E-11	3.0E-11	2.5E-11
		S	0.005	1.7E-10	5.0E-04	1.3E-10	6.5E-11	4.3E-11	3.2E-11	2.6E-11
Am-238	1.63 h	F	0.005	4.3E-10	5.0E-04	3.1E-10	2.3E-10	2.0E-10	1.8E-10	1.9E-10
		M	0.005	3.1E-10	5.0E-04	2.6E-10	1.3E-10	9.4E-11	8.0E-11	8.0E-11
		S	0.005	2.7E-10	5.0E-04	2.2E-10	1.3E-10	8.2E-11	6.1E-11	5.4E-11
Am-239	11.9 h	F	0.005	8.1E-10	5.0E-04	5.8E-10	2.8E-10	1.8E-10	9.1E-11	7.6E-11
		M	0.005	1.5E-09	5.0E-04	1.1E-09	5.8E-10	3.7E-10	2.7E-10	2.2E-10
		S	0.005	1.6E-09	5.0E-04	1.1E-09	5.9E-10	4.0E-10	2.5E-10	2.4E-10
Am-240	2.12 d	F	0.005	2.0E-09	5.0E-04	1.7E-09	8.8E-10	5.7E-10	3.8E-10	2.9E-10
		M	0.005	2.9E-09	5.0E-04	2.2E-09	1.2E-09	7.7E-10	5.3E-10	4.3E-10
		S	0.005	3.0E-09	5.0E-04	2.3E-09	1.2E-09	7.8E-10	5.3E-10	4.3E-10
Am-241	4.32E+02 y	F	0.005	1.8E-04	5.0E-04	1.8E-04	1.2E-04	1.0E-04	9.2E-05	9.6E-05
		M	0.005	7.3E-05	5.0E-04	6.9E-05	5.1E-05	4.0E-05	4.0E-05	4.2E-05
		S	0.005	4.6E-05	5.0E-04	4.0E-05	2.7E-05	1.9E-05	1.7E-05	1.6E-05
Am-242	16.0 h	F	0.005	9.2E-08	5.0E-04	7.1E-08	3.5E-08	2.1E-08	1.4E-08	1.1E-08
		M	0.005	7.6E-08	5.0E-04	5.9E-08	3.6E-08	2.4E-08	2.1E-08	1.7E-08
		S	0.005	8.0E-08	5.0E-04	6.2E-08	3.9E-08	2.7E-08	2.4E-08	2.0E-08
Am-242m	1.52E+02 y	F	0.005	1.6E-04	5.0E-04	1.5E-04	1.1E-04	9.4E-05	8.8E-05	9.2E-05
		M	0.005	5.2E-05	5.0E-04	5.3E-05	4.1E-05	3.4E-05	3.5E-05	3.7E-05
		S	0.005	2.5E-05	5.0E-04	2.0E-05	1.7E-05	1.2E-05	1.2E-05	1.2E-05
Am-243	7.38E+03 y	F	0.005	1.8E-04	5.0E-04	1.7E-04	1.2E-04	1.0E-04	9.1E-05	9.6E-05
		M	0.005	7.2E-05	5.0E-04	6.8E-05	5.0E-05	4.0E-05	4.0E-05	4.1E-05
		S	0.005	4.4E-05	5.0E-04	3.9E-05	2.6E-05	1.8E-05	1.6E-05	1.5E-05
Am-244	10.1 h	F	0.005	1.0E-08	5.0E-04	9.2E-09	6.6E-09	4.9E-09	3.5E-09	3.7E-09
		M	0.005	6.0E-09	5.0E-04	5.0E-09	3.2E-09	2.2E-09	2.0E-09	2.0E-09
		S	0.005	4.1E-09	5.0E-04	4.0E-09	2.1E-09	1.6E-09	1.4E-09	1.2E-09
Am-244m	0.433 h	F	0.005	4.6E-10	5.0E-04	4.0E-10	2.4E-10	1.8E-10	1.5E-10	1.6E-10
		M	0.005	3.3E-10	5.0E-04	2.1E-10	1.3E-10	9.2E-11	8.3E-11	8.0E-11
		S	0.005	3.0E-10	5.0E-04	2.2E-10	1.2E-10	8.1E-11	5.5E-11	5.7E-11
Am-245	2.05 h	F	0.005	7.1E-10	5.0E-04	3.4E-10	8.2E-11	6.0E-11	2.4E-11	2.1E-11
		M	0.005	3.9E-10	5.0E-04	2.8E-10	1.3E-10	8.7E-11	6.4E-11	5.3E-11
		S	0.005	4.1E-10	5.0E-04	2.8E-10	1.3E-10	9.2E-11	6.8E-11	5.8E-11
Am-246	0.650 h	F	0.005	3.0E-10	5.0E-04	2.0E-10	9.3E-11	6.1E-11	3.8E-11	3.3E-11
		M	0.005	5.0E-10	5.0E-04	3.6E-10	1.6E-10	1.1E-10	7.9E-11	6.6E-11
		S	0.005	5.3E-10	5.0E-04	3.8E-10	1.7E-10	1.2E-10	8.3E-11	6.9E-11
Am-246m	0.417 h	F	0.005	1.2E-10	5.0E-04	8.9E-11	4.2E-11	2.6E-11	1.6E-11	1.4E-11
		M	0.005	1.8E-10	5.0E-04	1.3E-10	6.1E-11	4.0E-11	3.1E-11	2.2E-11
		S	0.005	2.0E-10	5.0E-04	1.4E-10	6.4E-11	4.1E-11	2.7E-11	2.3E-11
Curium[a]										
Cm-238	2.40 h	F	0.005	3.7E-09	5.0E-04	5.4E-09	2.6E-09	1.8E-09	9.2E-10	7.8E-10
		M	0.005	2.1E-08	5.0E-04	1.5E-08	7.9E-09	5.9E-09	5.6E-09	4.3E-09
		S	0.005	2.2E-08	5.0E-04	1.6E-08	8.4E-09	6.4E-09	6.1E-09	4.9E-09
Cm-240	27.0 d	F	0.005	8.3E-06	5.0E-04	6.3E-06	3.2E-06	2.0E-06	1.9E-06	1.3E-06
		M	0.005	1.2E-05	5.0E-04	9.2E-06	5.8E-06	4.2E-06	3.9E-06	3.2E-06
		S	0.005	1.3E-05	5.0E-04	9.5E-06	6.0E-06	4.6E-06	4.3E-06	3.5E-06

a Dose coefficients for this element are based on age-specific biokinetic data