

APPENDIX A TO PART 835—DERIVED AIR CONCENTRATIONS (DAC) FOR CONTROLLING RADIATION EXPOSURE TO WORKERS AT DOE FACILITIES

The data presented in appendix A are to be used for controlling individual internal doses in accordance with §835.209, identifying the need for air monitoring in accordance with §835.403, and identifying and posting airborne radioactivity areas in accordance with §835.603(d).

The DAC values are given for individual radionuclides. For known mixtures of radionuclides, determine the sum of the ratio of the observed concentration of a particular radionuclide and its corresponding DAC for all radionuclides in the mixture. If this sum exceeds unity (1), then the DAC has been exceeded. For unknown radionuclides, the most restrictive DAC (lowest value) for those isotopes not known to be absent shall be used. For any single radionuclide not listed in appendix A with decay mode other than alpha emission or spontaneous fission and with radioactive half-life greater than two hours, the DAC value shall be 4 E-11 µCi/mL (1 Bq/m<sup>3</sup>). For any single radionuclide not listed in appendix A that decays by alpha emission or spontaneous fission the DAC value shall be 2 E-13 µCi/mL (8 E-03 Bq/m<sup>3</sup>).

The DACs for limiting radiation exposures through inhalation of radionuclides by workers are listed in this appendix. The values are based on either a stochastic (committed

effective dose) dose limit of 5 rems (0.05 Sv) or a deterministic (organ or tissue) dose limit of 50 rems (0.5 Sv) per year, whichever is more limiting.

NOTE: the 15 rems (0.15 Sv) dose limit for the lens of the eye does not appear as a critical organ dose limit.

The columns in this appendix contain the following information: (1) Radionuclide; (2) inhaled air DAC for type F (fast), type M (moderate), and type S (slow) materials in units of µCi/mL; (3) inhaled air DAC for type F (fast), type M (moderate), and type S (slow) materials in units of Bq/m<sup>3</sup>; (4) an indication of whether or not the DAC for each class is controlled by the stochastic (effective dose) or deterministic (organ or tissue) dose. The absorption types (F, M, and S) have been established to describe the absorption type of the materials from the respiratory tract into the blood. The range of half-times for the absorption types correspond to: Type F, 100% at 10 minutes; Type M, 10% at 10 minutes and 90% at 140 days; and Type S 0.1% at 10 minutes and 99.9% at 7000 days. The DACs are listed by radionuclide, in order of increasing atomic mass, and are based on the assumption that the particle size distribution of 5 micrometers AMAD is used. For situations where the particle size distribution is known to differ significantly from 5 micrometers AMAD, appropriate corrections may be made to both the estimated dose to workers and the DACs.

Radionuclide	Absorption type <sup>3</sup>			Absorption type <sup>3</sup>			Stochastic or organ or tissue <sup>1</sup>
	µCi/mL			Bq/m <sup>3</sup>			
	F	M	S	F	M	S	(F/M/S)
H-3 (Water) <sup>2</sup> ..	2 E-05	2 E-05	2 E-05	7 E+05	7 E+05	7 E+05	St/St/St
H-3 (Elemental) <sup>2</sup> .	2 E-01	2 E-01	2 E-01	9 E+09	9 E+09	9 E+09	St/St/St
STCs (Insoluble) <sup>4</sup> .	1 E-05	6 E-06	2 E-06	3 E+05	2 E+05	8 E+04	St/St/St
STCs (Soluble)	1 E-05	1 E-05	1 E-05	5 E+05	5 E+05	5 E+05	St/St/St
Be-7 .....	-	1 E-05	1 E-05	-	4 E+05	4 E+05	/St/St
Be-10 .....	-	8 E-08	2 E-08	-	3 E+03	1 E+03	/St/St
C-11 (Vapor) <sup>2</sup>	-	1 E-04	-	-	6 E+06	-	/St/
C-11 (CO) <sup>2</sup> .....	4 E-04	4 E-04	4 E-04	1 E+07	1 E+07	1 E+07	St/St/St
C-11 (CO <sub>2</sub> ) <sup>2</sup> ..	2 E-04	2 E-04	2 E-04	9 E+06	9 E+06	9 E+06	St/St/St
C-14 (Vapor) <sup>2</sup>	-	9 E-07	-	-	3 E+04	-	/St/
C-14 (CO) <sup>2</sup> .....	7 E-04	7 E-04	7 E-04	2 E+07	2 E+07	2 E+07	St/St/St
C-14 (CO <sub>2</sub> ) <sup>2</sup> ..	8 E-05	8 E-05	8 E-05	3 E+06	3 E+06	3 E+06	St/St/St
F-18 .....	4 E-06	3 E-06	3 E-06	1 E+05	1 E+05	1 E+05	ET/ET/ET
Na-22 .....	2 E-07	-	-	1 E+04	-	-	E/ /
Na-24 .....	4 E-07	-	-	1 E+04	-	-	ET/ /
Mg-28 .....	3 E-07	3 E-07	-	1 E+04	1 E+04	-	ET/St/
Al-26 .....	4 E-08	4 E-08	-	1 E+03	1 E+03	-	St/St/
Si-31 .....	9 E-06	5 E-06	5 E-06	3 E+05	1 E+05	1 E+05	ET/St/St
Si-32 .....	1 E-07	5 E-08	1 E-08	5 E+03	2 E+03	3 E+02	St/St/St
P-32 .....	5 E-07	1 E-07	-	1 E+04	7 E+03	-	St/St/
P-33 .....	4 E-06	4 E-07	-	1 E+05	1 E+04	-	St/St/
S-35 (Vapor) ...	-	4 E-06	-	-	1 E+05	-	/St/
S-35 .....	7 E-06	5 E-07	-	2 E+05	1 E+04	-	St/St/
Cl-36 .....	1 E-06	1 E-07	-	4 E+04	4 E+03	-	St/St/
Cl-38 .....	7 E-06	5 E-06	-	2 E+05	2 E+05	-	ET/ET/
Cl-39 .....	2 E-06	4 E-06	-	1 E+05	1 E+05	-	ET/ET/
K-40 .....	1 E-07	-	-	6 E+03	-	-	St/ /
K-42 .....	2 E-06	-	-	1 E+05	-	-	E/ /

Radionuclide	Absorption type <sup>3</sup>			Absorption type <sup>3</sup>			Stochastic or organ or tissue <sup>1</sup> (F/M/S)
	μCi/mL			Bq/m <sup>3</sup>			
	F	M	S	F	M	S	
K-43	9 E-07	-	-	3 E+04	-	-	ET/ /
K-44	8 E-06	-	-	2 E+05	-	-	ET/ /
K-45	9 E-06	-	-	3 E+05	-	-	ET/ /
Ca-41	-	2 E-06	-	-	8 E+04	-	/BS/
Ca-45	-	2 E-07	-	-	9 E+03	-	/St/
Ca-47	-	2 E-07	-	-	9 E+03	-	/St/
Sc-43	-	-	2 E-06	-	-	7 E+04	/ /ET
Sc-44m	-	-	2 E-07	-	-	1 E+04	/ /St
Sc-44	-	-	1 E-06	-	-	4 E+04	/ /ET
Sc-46	-	-	1 E-07	-	-	4 E+03	/ /St
Sc-47	-	-	7 E-07	-	-	2 E+04	/ /St
Sc-48	-	-	2 E-07	-	-	1 E+04	/ /ET
Sc-49	-	-	8 E-06	-	-	3 E+05	/ /ET
Ti-44	7 E-09	2 E-08	9 E-09	2 E+02	7 E+02	3 E+02	St/St/St
Ti-45	3 E-06	2 E-06	2 E-06	1 E+05	1 E+05	1 E+05	ET/ET/ET
V-47	8 E-06	6 E-06	-	3 E+05	2 E+05	-	ET/ET/
V-48	2 E-07	2 E-07	-	9 E+03	7 E+03	-	ET/St/
V-49	1 E-05	2 E-05	-	7 E+05	9 E+05	-	BS/St/
Cr-48	2 E-06	2 E-06	2 E-06	8 E+04	8 E+04	8 E+04	ET/ET/ET
Cr-49	7 E-06	5 E-06	5 E-06	2 E+05	2 E+05	2 E+05	ET/ET/ET
Cr-51	1 E-05	1 E-05	1 E-05	6 E+05	6 E+05	5 E+05	St/St/St
Mn-51	7 E-06	5 E-06	-	2 E+05	2 E+05	-	ET/ET/
Mn-52m	7 E-06	5 E-06	-	2 E+05	2 E+05	-	ET/ET/
Mn-52	2 E-07	2 E-07	-	8 E+03	8 E+03	-	ET/ET/
Mn-53	5 E-06	1 E-05	-	2 E+05	5 E+05	-	BS/St/
Mn-54	5 E-07	4 E-07	-	1 E+04	1 E+04	-	St/St/
Mn-56	2 E-06	2 E-06	-	9 E+04	8 E+04	-	ET/ET/
Fe-52	6 E-07	5 E-07	-	2 E+04	2 E+04	-	ET/E/
Fe-55	6 E-07	1 E-06	-	2 E+04	6 E+04	-	St/St/
Fe-59	1 E-07	1 E-07	-	6 E+03	6 E+03	-	St/St/
Fe-60	1 E-09	4 E-09	-	6 E+01	1 E+02	-	St/St/
Co-55	-	5 E-07	5 E-07	-	2 E+04	2 E+04	/ET/ET
Co-56	-	1 E-07	1 E-07	-	5 E+03	4 E+03	/St/St
Co-57	-	1 E-06	9 E-07	-	5 E+04	3 E+04	/St/St
Co-58m	-	3 E-05	3 E-05	-	1 E+06	1 E+06	/St/St
Co-58	-	4 E-07	3 E-07	-	1 E+04	1 E+04	/St/St
Co-60m	-	4 E-04	4 E-04	-	1 E+07	1 E+07	/St/St
Co-60	-	7 E-08	3 E-08	-	2 E+03	1 E+03	/St/St
Co-61	-	6 E-06	6 E-06	-	2 E+05	2 E+05	/ET/ET
Co-62m	-	7 E-06	6 E-06	-	2 E+05	2 E+05	/ET/ET
Ni-56 (Inorg)	4 E-07	4 E-07	-	1 E+04	1 E+04	-	ET/ET/
Ni-56 (Carbonyl)	-	4 E-07	-	-	1 E+04	-	/St/
Ni-57 (Inorg)	5 E-07	5 E-07	-	2 E+04	2 E+04	-	ET/ET/
Ni-57 (Carbonyl)	-	7 E-07	-	-	2 E+04	-	/ET/
Ni-59 (Inorg)	2 E-06	5 E-06	-	9 E+04	2 E+05	-	St/St/
Ni-59 (Carbonyl)	-	6 E-07	-	-	2 E+04	-	/St/
Ni-63 (Inorg)	1 E-06	1 E-06	-	4 E+04	6 E+04	-	St/St/
Ni-63 (Carbonyl)	-	2 E-07	-	-	1 E+04	-	/St/
Ni-65 (Inorg)	5 E-06	4 E-06	-	1 E+05	1 E+05	-	ET/ET/
Ni-65 (Carbonyl)	-	8 E-07	-	-	3 E+04	-	/ET/
Ni-66 (Inorg)	7 E-07	2 E-07	-	2 E+04	1 E+04	-	St/St/
Ni-66 (Carbonyl)	-	2 E-07	-	-	1 E+04	-	/ET/
Cu-60	5 E-06	4 E-06	4 E-06	1 E+05	1 E+05	1 E+05	ET/ET/ET
Cu-61	3 E-06	3 E-06	3 E-06	1 E+05	1 E+05	1 E+05	ET/ET/ET
Cu-64	4 E-06	3 E-06	3 E-06	1 E+05	1 E+05	1 E+05	ET/E/E
Cu-67	2 E-06	1 E-06	9 E-07	8 E+04	3 E+04	3 E+04	ET/St/St
Zn-62	-	-	8 E-07	-	-	3 E+04	/ /St
Zn-63	-	-	5 E-06	-	-	2 E+05	/ /ET
Zn-65	-	-	2 E-07	-	-	7 E+03	/ /St
Zn-69m	-	-	1 E-06	-	-	6 E+04	/ /St
Zn-69	-	-	7 E-06	-	-	2 E+05	/ /ET
Zn-71m	-	-	1 E-06	-	-	5 E+04	/ /ET
Zn-72	-	-	3 E-07	-	-	1 E+04	/ /St
Ga-65	1 E-05	9 E-06	-	4 E+05	3 E+05	-	ET/ET/
Ga-66	8 E-07	7 E-07	-	3 E+04	2 E+04	-	ET/St/

Radionuclide	Absorption type <sup>3</sup>			Absorption type <sup>3</sup>			Stochastic or organ or tissue <sup>1</sup>
	μCi/mL			Bq/m <sup>3</sup>			
	F	M	S	F	M	S	(F/M/S)
Ga-67	3 E-06	2 E-06	-	1 E+05	7 E+04	-	ET/S/
Ga-68	6 E-06	4 E-06	-	2 E+05	1 E+05	-	ET/ET/
Ga-70	1 E-05	1 E-05	-	6 E+05	4 E+05	-	ET/ET/
Ga-72	5 E-07	5 E-07	-	2 E+04	2 E+04	-	ET/ET/
Ga-73	4 E-06	2 E-06	-	1 E+05	1 E+05	-	ET/S/
Ge-66	2 E-06	2 E-06	-	9 E+04	9 E+04	-	ET/ET/
Ge-67	1 E-05	7 E-06	-	3 E+05	2 E+05	-	ET/ET/
Ge-68	6 E-07	7 E-08	-	2 E+04	2 E+03	-	ET/S/
Ge-69	1 E-06	1 E-06	-	3 E+04	3 E+04	-	ET/ET/
Ge-71	5 E-05	5 E-05	-	2 E+06	1 E+06	-	ET/E/
Ge-75	1 E-05	7 E-06	-	4 E+05	2 E+05	-	ET/ET/
Ge-77	1 E-06	1 E-06	-	4 E+04	4 E+04	-	ET/ET/
Ge-78	3 E-06	3 E-06	-	1 E+05	1 E+05	-	ET/ET/
As-69	-	9 E-06	-	-	3 E+05	-	/ET/
As-70	-	2 E-06	-	-	8 E+04	-	/ET/
As-71	-	1 E-06	-	-	4 E+04	-	/S/
As-72	-	4 E-07	-	-	1 E+04	-	/S/
As-73	-	8 E-07	-	-	3 E+04	-	/S/
As-74	-	3 E-07	-	-	1 E+04	-	/S/
As-76	-	6 E-07	-	-	2 E+04	-	/S/
As-77	-	1 E-06	-	-	4 E+04	-	/S/
As-78	-	3 E-06	-	-	1 E+05	-	/ET/
Se-70	2 E-06	2 E-06	-	1 E+05	9 E+04	-	ET/ET/
Se-73m	1 E-05	1 E-05	-	5 E+05	4 E+05	-	ET/ET/
Se-73	1 E-06	1 E-06	-	6 E+04	5 E+04	-	ET/ET/
Se-75	4 E-07	3 E-07	-	1 E+04	1 E+04	-	St/St/
Se-79	3 E-07	1 E-07	-	1 E+04	6 E+03	-	K/St/
Se-81m	1 E-05	6 E-06	-	3 E+05	2 E+05	-	ET/ET/
Se-81	1 E-05	1 E-05	-	6 E+05	4 E+05	-	ET/ET/
Se-83	6 E-06	5 E-06	-	2 E+05	1 E+05	-	ET/ET/
Br-74m	3 E-06	2 E-06	-	1 E+05	1 E+05	-	ET/ET/
Br-74	4 E-06	4 E-06	-	1 E+05	1 E+05	-	ET/ET/
Br-75	4 E-06	3 E-06	-	1 E+05	1 E+05	-	ET/ET/
Br-76	5 E-07	5 E-07	-	2 E+04	2 E+04	-	ET/ET/
Br-77	2 E-06	2 E-06	-	7 E+04	7 E+04	-	ET/ET/
Br-80m	6 E-06	5 E-06	-	2 E+05	2 E+05	-	ET/S/
Br-80	3 E-05	2 E-05	-	1 E+06	7 E+05	-	ET/ET/
Br-82	3 E-07	3 E-07	-	1 E+04	1 E+04	-	ET/ET/
Br-83	9 E-06	6 E-06	-	3 E+05	2 E+05	-	ET/ET/
Br-84	7 E-06	5 E-06	-	2 E+05	2 E+05	-	ET/ET/
Rb-79	8 E-06	-	-	2 E+05	-	-	ET/ /
Rb-81m	1 E-05	-	-	6 E+05	-	-	ET/ /
Rb-81	2 E-06	-	-	1 E+05	-	-	ET/ /
Rb-82m	8 E-07	-	-	3 E+04	-	-	ET/ /
Rb-83	5 E-07	-	-	2 E+04	-	-	St/ /
Rb-84	3 E-07	-	-	1 E+04	-	-	St/ /
Rb-86	4 E-07	-	-	1 E+04	-	-	St/ /
Rb-87	7 E-07	-	-	2 E+04	-	-	St/ /
Rb-88	1 E-05	-	-	5 E+05	-	-	ET/ /
Rb-89	1 E-05	-	-	3 E+05	-	-	ET/ /
Sr-80	3 E-06	-	2 E-06	1 E+05	-	9 E+04	ET/ /St
Sr-81	7 E-06	-	5 E-06	2 E+05	-	2 E+05	ET/ /ET
Sr-82	1 E-07	-	7 E-08	6 E+03	-	2 E+03	St/ /St
Sr-83	1 E-06	-	9 E-07	3 E+04	-	3 E+04	ET/ /ET
Sr-85m	4 E-05	-	3 E-05	1 E+06	-	1 E+06	ET/ /ET
Sr-85	1 E-06	-	8 E-07	3 E+04	-	3 E+04	St/ /St
Sr-87m	1 E-05	-	9 E-06	4 E+05	-	3 E+05	ET/ /ET
Sr-89	4 E-07	-	1 E-07	1 E+04	-	3 E+03	St/ /St
Sr-90	1 E-08	-	7 E-09	4 E+02	-	2 E+02	BS/ /St
Sr-91	1 E-06	-	9 E-07	5 E+04	-	3 E+04	ET/ /St
Sr-92	2 E-06	-	1 E-06	8 E+04	-	6 E+04	ET/ /St
Y-86m	-	7 E-06	6 E-06	-	2 E+05	2 E+05	/ET/ET
Y-86	-	4 E-07	4 E-07	-	1 E+04	1 E+04	/ET/ET
Y-87	-	9 E-07	8 E-07	-	3 E+04	3 E+04	/ET/ET
Y-88	-	1 E-07	1 E-07	-	6 E+03	6 E+03	/St/St
Y-90m	-	4 E-06	4 E-06	-	1 E+05	1 E+05	/St/St
Y-90	-	3 E-07	3 E-07	-	1 E+04	1 E+04	/St/St
Y-91m	-	2 E-05	2 E-05	-	7 E+05	7 E+05	/ET/ET
Y-91	-	1 E-07	9 E-08	-	4 E+03	3 E+03	/St/St
Y-92	-	2 E-06	2 E-06	-	7 E+04	7 E+04	/St/St
Y-93	-	9 E-07	9 E-07	-	3 E+04	3 E+04	/St/St

Radionuclide	Absorption type <sup>3</sup>			Absorption type <sup>3</sup>			Stochastic or organ or tissue <sup>1</sup> (F/M/S)
	μCi/mL			Bq/m <sup>3</sup>			
	F	M	S	F	M	S	
Y-94	-	8 E-06	8 E-06	-	3 E+05	3 E+05	/ET/ET
Y-95	-	1 E-05	1 E-05	-	4 E+05	4 E+05	/ET/ET
Zr-86	5 E-07	5 E-07	5 E-07	2 E+04	2 E+04	2 E+04	ET/ET/ET
Zr-88	1 E-07	3 E-07	3 E-07	5 E+03	1 E+04	1 E+04	St/St/St
Zr-89	6 E-07	6 E-07	6 E-07	2 E+04	2 E+04	2 E+04	ET/ET/ET
Zr-93	3 E-09	1 E-08	1 E-07	1 E+02	6 E+02	5 E+03	BS/BS/BS
Zr-95	9 E-08	1 E-07	1 E-07	3 E+03	5 E+03	4 E+03	BS/St/St
Zr-97	7 E-07	4 E-07	4 E-07	2 E+04	1 E+04	1 E+04	ET/St/St
Nb-88	-	5 E-06	5 E-06	-	1 E+05	1 E+05	/ET/ET
Nb-89 (66 min)	-	3 E-06	3 E-06	-	1 E+05	1 E+05	/ET/ET
Nb-89 (122 min)	-	2 E-06	2 E-06	-	1 E+05	1 E+05	/ET/ET
Nb-90	-	3 E-07	3 E-07	-	1 E+04	1 E+04	/ET/ET
Nb-93m	-	1 E-06	6 E-07	-	7 E+04	2 E+04	/St/St
Nb-94	-	7 E-08	2 E-08	-	2 E+03	8 E+02	/St/St
Nb-95m	-	7 E-07	6 E-07	-	2 E+04	2 E+04	/St/St
Nb-95	-	4 E-07	4 E-07	-	1 E+04	1 E+04	/St/St
Nb-96	-	4 E-07	4 E-07	-	1 E+04	1 E+04	/ET/ET
Nb-97	-	5 E-06	5 E-06	-	1 E+05	1 E+05	/ET/ET
Nb-98	-	3 E-06	3 E-06	-	1 E+05	1 E+05	/ET/ET
Mo-90	8 E-07	-	7 E-07	3 E+04	-	2 E+04	ET/ /ET
Mo-93m	1 E-06	-	1 E-06	3 E+04	-	3 E+04	ET/ /ET
Mo-93	2 E-07	-	4 E-07	7 E+03	-	1 E+04	BS/ /St
Mo-99	1 E-06	-	5 E-07	5 E+04	-	1 E+04	E/ /St
Mo-101	8 E-06	-	6 E-06	3 E+05	-	2 E+05	ET/ /ET
Tc-93m	8 E-06	7 E-06	-	3 E+05	2 E+05	-	ET/ET/
Tc-93	3 E-06	3 E-06	-	1 E+05	1 E+05	-	ET/ET/
Tc-94m	5 E-06	4 E-06	-	1 E+05	1 E+05	-	ET/ET/
Tc-94	1 E-06	1 E-06	-	4 E+04	3 E+04	-	ET/ET/
Tc-95m	8 E-07	6 E-07	-	3 E+04	2 E+04	-	ET/St/
Tc-95	1 E-06	1 E-06	-	5 E+04	5 E+04	-	ET/ET/
Tc-96m	2 E-05	2 E-05	-	1 E+06	1 E+06	-	ET/ET/
Tc-96	3 E-07	3 E-07	-	1 E+04	1 E+04	-	ET/ET/
Tc-97m	1 E-06	2 E-07	-	5 E+04	7 E+03	-	St/St/
Tc-97	4 E-06	3 E-06	-	1 E+05	1 E+05	-	ET/St/
Tc-98	3 E-07	9 E-08	-	1 E+04	3 E+03	-	St/St/
Tc-99m	1 E-05	1 E-05	-	5 E+05	4 E+05	-	ET/ET/
Tc-99	1 E-06	1 E-07	-	5 E+04	6 E+03	-	St/St/
Tc-101	1 E-05	1 E-05	-	6 E+05	4 E+05	-	ET/ET/
Tc-104	9 E-06	7 E-06	-	3 E+05	2 E+05	-	ET/ET/
Ru-94	5 E-06	5 E-06	5 E-06	2 E+05	1 E+05	1 E+05	ET/ET/ET
Ru-97	2 E-06	2 E-06	2 E-06	8 E+04	8 E+04	8 E+04	ET/ET/ET
Ru-103	8 E-07	2 E-07	2 E-07	3 E+04	1 E+04	9 E+03	St/St/St
Ru-105	2 E-06	2 E-06	2 E-06	9 E+04	8 E+04	8 E+04	ET/ET/ET
Ru-106	5 E-08	3 E-08	1 E-08	2 E+03	1 E+03	5 E+02	St/St/St
Rh-99m	3 E-06	3 E-06	3 E-06	1 E+05	1 E+05	1 E+05	ET/ET/ET
Rh-99	8 E-07	6 E-07	6 E-07	3 E+04	2 E+04	2 E+04	ET/St/St
Rh-100	5 E-07	5 E-07	5 E-07	1 E+04	1 E+04	1 E+04	ET/ET/ET
Rh-101m	1 E-06	1 E-06	1 E-06	6 E+04	6 E+04	6 E+04	ET/ET/ET
Rh-101	3 E-07	3 E-07	1 E-07	1 E+04	1 E+04	6 E+03	St/St/St
Rh-102m	2 E-07	2 E-07	1 E-07	1 E+04	7 E+03	4 E+03	St/St/St
Rh-102	6 E-08	1 E-07	6 E-08	2 E+03	4 E+03	2 E+03	St/St/St
Rh-103m	4 E-04	2 E-04	2 E-04	1 E+07	8 E+06	8 E+06	St/St/St
Rh-105	3 E-06	1 E-06	1 E-06	1 E+05	5 E+04	4 E+04	ET/St/St
Rh-106m	1 E-06	1 E-06	1 E-06	6 E+04	5 E+04	5 E+04	ET/ET/ET
Rh-107	1 E-05	9 E-06	9 E-06	5 E+05	3 E+05	3 E+05	ET/ET/ET
Pd-100	5 E-07	5 E-07	5 E-07	2 E+04	2 E+04	2 E+04	ET/ET/ET
Pd-101	3 E-06	3 E-06	3 E-06	1 E+05	1 E+05	1 E+05	ET/ET/ET
Pd-103	4 E-06	1 E-06	1 E-06	1 E+05	6 E+04	7 E+04	E/St/St
Pd-107	1 E-05	1 E-05	1 E-06	5 E+05	4 E+05	7 E+04	K/St/St
Pd-109	2 E-06	1 E-06	1 E-06	9 E+04	4 E+04	4 E+04	St/St/St
Ag-102	9 E-06	7 E-06	7 E-06	3 E+05	2 E+05	2 E+05	ET/ET/ET
Ag-103	8 E-06	7 E-06	7 E-06	3 E+05	2 E+05	2 E+05	ET/ET/ET
Ag-104m	8 E-06	6 E-06	6 E-06	2 E+05	2 E+05	2 E+05	ET/ET/ET
Ag-104	3 E-06	3 E-06	3 E-06	1 E+05	1 E+05	1 E+05	ET/ET/ET
Ag-105	7 E-07	8 E-07	7 E-07	2 E+04	2 E+04	2 E+04	St/St/St
Ag-106m	2 E-07	2 E-07	2 E-07	9 E+03	9 E+03	9 E+03	ET/ET/ET
Ag-106	1 E-05	1 E-05	1 E-05	5 E+05	4 E+05	4 E+05	ET/ET/ET
Ag-108m	7 E-08	1 E-07	2 E-08	2 E+03	4 E+03	1 E+03	St/St/St
Ag-110m	8 E-08	9 E-08	7 E-08	3 E+03	3 E+03	2 E+03	St/St/St
Ag-111	9 E-07	3 E-07	3 E-07	3 E+04	1 E+04	1 E+04	St/St/St

Radionuclide	Absorption type <sup>3</sup>			Absorption type <sup>3</sup>			Stochastic or organ or tissue <sup>1</sup>
	μCi/mL			Bq/m <sup>3</sup>			
	F	M	S	F	M	S	(F/M/S)
Ag-112	4 E-06	2 E-06	2 E-06	1 E+05	8 E+04	8 E+04	E/Sv/St
Ag-115	1 E-05	8 E-06	8 E-06	4 E+05	3 E+05	3 E+05	ET/ET/ET
Cd-104	4 E-06	4 E-06	4 E-06	1 E+05	1 E+05	1 E+05	ET/ET/ET
Cd-107	5 E-06	5 E-06	4 E-06	2 E+05	1 E+05	1 E+05	ET/ET/ET
Cd-109	2 E-08	9 E-08	1 E-07	9 E+02	3 E+03	4 E+03	K/K/St
Cd-113m	1 E-09	6 E-09	1 E-08	6 E+01	2 E+02	6 E+02	K/K/K
Cd-113	1 E-09	5 E-09	1 E-08	5 E+01	2 E+02	5 E+02	K/K/K
Cd-115m	3 E-08	1 E-07	1 E-07	1 E+03	3 E+03	3 E+03	K/Sv/St
Cd-115	9 E-07	4 E-07	4 E-07	3 E+04	1 E+04	1 E+04	K/Sv/St
Cd-117m	1 E-06	1 E-06	1 E-06	4 E+04	4 E+04	4 E+04	ET/ET/ET
Cd-117	2 E-06	2 E-06	2 E-06	8 E+04	7 E+04	7 E+04	ET/ET/ET
In-109	4 E-06	4 E-06	-	1 E+05	1 E+05	-	ET/ET/
In-110 (69 min)	5 E-06	4 E-06	-	1 E+05	1 E+05	-	ET/ET/
In-110 (5 h)	9 E-07	9 E-07	-	3 E+04	3 E+04	-	ET/ET/
In-111	1 E-06	1 E-06	-	5 E+04	5 E+04	-	ET/ET/
In-112	2 E-05	1 E-05	-	9 E+05	6 E+05	-	ET/ET/
In-113m	1 E-05	1 E-05	-	4 E+05	3 E+05	-	ET/ET/
In-114m	5 E-08	9 E-08	-	1 E+03	3 E+03	-	Sv/Sv/
In-115m	6 E-06	5 E-06	-	2 E+05	2 E+05	-	ET/ET/
In-115	1 E-09	5 E-09	-	4 E+01	1 E+02	-	Sv/Sv/
In-116m	4 E-06	3 E-06	-	1 E+05	1 E+05	-	ET/ET/
In-117m	5 E-06	4 E-06	-	2 E+05	1 E+05	-	ET/ET/
In-117	7 E-06	5 E-06	-	2 E+05	2 E+05	-	ET/ET/
In-119m	1 E-05	1 E-05	-	6 E+05	4 E+05	-	ET/ET/
Sn-110	1 E-06	1 E-06	-	6 E+04	6 E+04	-	ET/ET/
Sn-111	1 E-05	1 E-05	-	6 E+05	5 E+05	-	ET/ET/
Sn-113	7 E-07	2 E-07	-	2 E+04	1 E+04	-	Sv/Sv/
Sn-117m	8 E-07	2 E-07	-	3 E+04	9 E+03	-	BS/Sv/
Sn-119m	1 E-06	3 E-07	-	5 E+04	1 E+04	-	Sv/Sv/
Sn-121m	5 E-07	1 E-07	-	2 E+04	6 E+03	-	Sv/Sv/
Sn-121	4 E-06	2 E-06	-	1 E+05	7 E+04	-	ET/Sv/
Sn-123m	1 E-05	7 E-06	-	4 E+05	2 E+05	-	ET/ET/
Sn-123	3 E-07	1 E-07	-	1 E+04	3 E+03	-	Sv/Sv/
Sn-125	4 E-07	2 E-07	-	1 E+04	7 E+03	-	Sv/Sv/
Sn-126	4 E-08	3 E-08	-	1 E+03	1 E+03	-	Sv/Sv/
Sn-127	2 E-06	2 E-06	-	9 E+04	7 E+04	-	ET/ET/
Sn-128	2 E-06	2 E-06	-	1 E+05	8 E+04	-	ET/ET/
Sb-115	1 E-05	1 E-05	-	5 E+05	4 E+05	-	ET/ET/
Sb-116m	3 E-06	2 E-06	-	1 E+05	1 E+05	-	ET/ET/
Sb-116	1 E-05	1 E-05	-	4 E+05	3 E+05	-	ET/ET/
Sb-117	1 E-05	1 E-05	-	4 E+05	3 E+05	-	ET/ET/
Sb-118m	1 E-06	1 E-06	-	4 E+04	4 E+04	-	ET/ET/
Sb-119	6 E-06	6 E-06	-	2 E+05	2 E+05	-	ET/ET/
Sb-120 (16 min)	2 E-05	2 E-05	-	1 E+06	7 E+05	-	ET/ET/
Sb-120 (6 d)	3 E-07	3 E-07	-	1 E+04	1 E+04	-	ET/ET/
Sb-122	8 E-07	4 E-07	-	3 E+04	1 E+04	-	Sv/Sv/
Sb-124m	4 E-05	3 E-05	-	1 E+06	1 E+06	-	ET/ET/
Sb-124	2 E-07	1 E-07	-	1 E+04	4 E+03	-	Sv/Sv/
Sb-125	2 E-07	1 E-07	-	7 E+03	6 E+03	-	BS/Sv/
Sb-126m	1 E-05	7 E-06	-	3 E+05	2 E+05	-	ET/ET/
Sb-126	2 E-07	1 E-07	-	9 E+03	6 E+03	-	ET/Sv/
Sb-127	7 E-07	3 E-07	-	2 E+04	1 E+04	-	E/Sv/
Sb-128 (9 h)	5 E-07	5 E-07	-	2 E+04	2 E+04	-	ET/ET/
Sb-128 (10 min)	1 E-05	9 E-06	-	4 E+05	3 E+05	-	ET/ET/
Sb-129	1 E-06	1 E-06	-	6 E+04	5 E+04	-	ET/ET/
Sb-130	3 E-06	2 E-06	-	1 E+05	1 E+05	-	ET/ET/
Sb-131	6 E-06	4 E-06	-	2 E+05	1 E+05	-	ET/ET/
Te-116 (Vapor)	-	6 E-06	-	-	2 E+05	-	/St /
Te-116	2 E-06	2 E-06	-	8 E+04	7 E+04	-	ET/ET/
Te-121m (Vapor)	-	4 E-08	-	-	1 E+03	-	/BS/
Te-121m	1 E-07	1 E-07	-	4 E+03	5 E+03	-	BS/Sv/
Te-121 (Vapor)	-	1 E-06	-	-	4 E+04	-	/St /
Te-121	1 E-06	1 E-06	-	3 E+04	1 E+05	-	ET/ET/
Te-123m (Vapor)	-	5 E-08	-	-	2 E+03	-	/BS/
Te-123m	1 E-07	1 E-07	-	4 E+03	6 E+03	-	BS/Sv/
Te-123 (Vapor)	-	1 E-08	-	-	4 E+02	-	/BS/
Te-123	2 E-08	5 E-08	-	1 E+03	1 E+03	-	BS/BS/

Radionuclide	Absorption type <sup>3</sup>			Absorption type <sup>3</sup>			Stochastic or organ or tissue <sup>1</sup>
	μCi/mL			Bq/m <sup>3</sup>			
	F	M	S	F	M	S	(F/M/S)
Te-125m (Vapor)	–	1 E–07	–	–	3 E+03	–	/BS/
Te-125m (Vapor)	2 E–07	1 E–07	–	9 E+03	7 E+03	–	BS/Sv/
Te-127m (Vapor)	–	6 E–08	–	–	2 E+03	–	/BS/
Te-127m (Vapor)	1 E–07	9 E–08	–	5 E+03	3 E+03	–	BS/Sv/
Te-127 (Vapor)	–	7 E–06	–	–	2 E+05	–	/Sv/
Te-127 (Vapor)	5 E–06	3 E–06	–	2 E+05	1 E+05	–	ET/Sv/
Te-129m (Vapor)	–	1 E–07	–	–	5 E+03	–	/Sv/
Te-129m (Vapor)	3 E–07	1 E–07	–	1 E+04	3 E+03	–	Sv/Sv/
Te-129 (Vapor)	–	1 E–05	–	–	5 E+05	–	/Sv/
Te-129 (Vapor)	1 E–05	7 E–06	–	4 E+05	2 E+05	–	ET/ET/
Te-131m (Vapor)	–	1 E–07	–	–	5 E+03	–	/T/
Te-131m (Vapor)	3 E–07	3 E–07	–	1 E+04	1 E+04	–	T/Sv/
Te-131 (Vapor)	–	6 E–06	–	–	2 E+05	–	/T/
Te-131 (Vapor)	1 E–05	7 E–06	–	4 E+05	2 E+05	–	ET/ET/
Te-132 (Vapor)	–	7 E–08	–	–	2 E+03	–	/T/
Te-132 (Vapor)	1 E–07	1 E–07	–	6 E+03	6 E+03	–	T/Sv/
Te-133m (Vapor)	–	1 E–06	–	–	6 E+04	–	/T/
Te-133m (Vapor)	3 E–06	2 E–06	–	1 E+05	1 E+05	–	T/ET/
Te-133 (Vapor)	–	7 E–06	–	–	2 E+05	–	/T/
Te-133 (Vapor)	1 E–05	9 E–06	–	4 E+05	3 E+05	–	ET/ET/
Te-134 (Vapor)	–	6 E–06	–	–	2 E+05	–	/Sv/
Te-134 (Vapor)	3 E–06	2 E–06	–	1 E+05	1 E+05	–	ET/ET/
I-120m (Methyl)	4 E–06	–	–	1 E+05	–	–	T/ /
I-120m (Vapor)	–	3 E–06	–	–	1 E+05	–	/Sv/ /
I-120m (Vapor)	2 E–06	–	–	8 E+04	–	–	ET/ /
I-120 (Methyl)	1 E–06	–	–	6 E+04	–	–	T/ /
I-120 (Vapor)	–	1 E–06	–	–	5 E+04	–	/T/
I-120 (Vapor)	2 E–06	–	–	1 E+05	–	–	E/ /
I-121 (Methyl)	5 E–06	–	–	2 E+05	–	–	T/ /
I-121 (Vapor)	–	4 E–06	–	–	1 E+05	–	/T/
I-121 (Vapor)	8 E–06	–	–	3 E+05	–	–	T/ /
I-123 (Methyl)	1 E–06	–	–	7 E+04	–	–	T/ /
I-123 (Vapor)	–	1 E–06	–	–	5 E+04	–	/T/
I-123 (Vapor)	2 E–06	–	–	1 E+05	–	–	T/ /
I-124 (Methyl)	3 E–08	–	–	1 E+03	–	–	T/ /
I-124 (Vapor)	–	2 E–08	–	–	9 E+02	–	/T/
I-124 (Vapor)	4 E–08	–	–	1 E+03	–	–	T/ /
I-125 (Methyl)	2 E–08	–	–	9 E+02	–	–	/T/ /
I-125 (Vapor)	–	2 E–08	–	–	7 E+02	–	/T/
I-125 (Vapor)	3 E–08	–	–	1 E+03	–	–	T/ /
I-126 (Methyl)	1 E–08	–	–	5 E+02	–	–	T/ /
I-126 (Vapor)	–	1 E–08	–	–	4 E+02	–	/T/
I-126 (Vapor)	2 E–08	–	–	7 E+02	–	–	T/ /
I-128 (Methyl)	3 E–05	–	–	1 E+06	–	–	T/ /
I-128 (Vapor)	–	8 E–06	–	–	3 E+05	–	/Sv/
I-128 (Vapor)	1 E–05	–	–	6 E+05	–	–	ET/ /
I-129 (Methyl)	3 E–09	–	–	1 E+02	–	–	T/ /
I-129 (Vapor)	–	2 E–09	–	–	1 E+02	–	/T/
I-129 (Vapor)	5 E–09	–	–	2 E+02	–	–	T/ /
I-130 (Methyl)	2 E–07	–	–	7 E+03	–	–	T/ /
I-130 (Vapor)	–	1 E–07	–	–	6 E+03	–	/T/
I-130 (Vapor)	3 E–07	–	–	1 E+04	–	–	T/ /
I-131 (Methyl)	1 E–08	–	–	6 E+02	–	–	T/ /
I-131 (Vapor)	–	1 E–08	–	–	5 E+02	–	/T/
I-131 (Vapor)	2 E–08	–	–	9 E+02	–	–	T/ /
I-132m (Methyl)	1 E–06	–	–	7 E+04	–	–	T/ /
I-132m (Vapor)	–	1 E–06	–	–	6 E+04	–	/T/
I-132m (Vapor)	3 E–06	–	–	1 E+05	–	–	T/ /
I-132 (Methyl)	1 E–06	–	–	6 E+04	–	–	T/ /
I-132 (Vapor)	–	1 E–06	–	–	5 E+04	–	/T/
I-132 (Vapor)	2 E–06	–	–	7 E+04	–	–	T/ /
I-133 (Methyl)	9 E–08	–	–	3 E+03	–	–	T/ /
I-133 (Vapor)	–	7 E–08	–	–	2 E+03	–	/T/
I-133 (Vapor)	1 E–07	–	–	5 E+03	–	–	T/ /

Radionuclide	Absorption type <sup>3</sup>			Absorption type <sup>3</sup>			Stochastic or organ or tissue <sup>1</sup>
	μCi/mL			Bq/m <sup>3</sup>			
	F	M	S	F	M	S	(F/M/S)
I-134 (Methyl)	8 E-06	-	-	2 E+05	-	-	T/ /
I-134 (Vapor) ..	-	3 E-06	-	-	1 E+05	-	/St/
I-134 .....	3 E-06	-	-	1 E+05	-	-	ET/ /
I-135 (Methyl)	4 E-07	-	-	1 E+04	-	-	T/ /
I-135 (Vapor) ..	-	3 E-07	-	-	1 E+04	-	/T/
I-135 .....	6 E-07	-	-	2 E+04	-	-	T/ /
Cs-125 .....	1 E-05	-	-	4 E+05	-	-	ET/ /
Cs-127 .....	4 E-06	-	-	1 E+05	-	-	ET/ /
Cs-129 .....	2 E-06	-	-	9 E+04	-	-	ET/ /
Cs-130 .....	1 E-05	-	-	6 E+05	-	-	ET/ /
Cs-131 .....	7 E-06	-	-	2 E+05	-	-	ET/ /
Cs-132 .....	9 E-07	-	-	3 E+04	-	-	ET/ /
Cs-134m .....	8 E-06	-	-	2 E+05	-	-	ET/ /
Cs-134 .....	5 E-08	-	-	2 E+03	-	-	St/ /
Cs-135m .....	8 E-06	-	-	2 E+05	-	-	ET/ /
Cs-135 .....	5 E-07	-	-	2 E+04	-	-	St/ /
Cs-136 .....	2 E-07	-	-	1 E+04	-	-	E/ /
Cs-137 .....	8 E-08	-	-	3 E+03	-	-	St/ /
Cs-138 .....	5 E-06	-	-	2 E+05	-	-	ET/ /
Ba-126 .....	4 E-06	-	-	1 E+05	-	-	ET/ /
Ba-128 .....	4 E-07	-	-	1 E+04	-	-	St/ /
Ba-131m .....	4 E-05	-	-	1 E+06	-	-	ET/ /
Ba-131 .....	1 E-06	-	-	4 E+04	-	-	ET/ /
Ba-133m .....	2 E-06	-	-	7 E+04	-	-	St/ /
Ba-133 .....	3 E-07	-	-	1 E+04	-	-	St/ /
Ba-135m .....	2 E-06	-	-	9 E+04	-	-	St/ /
Ba-139 .....	1 E-05	-	-	3 E+05	-	-	St/ /
Ba-140 .....	3 E-07	-	-	1 E+04	-	-	St/ /
Ba-141 .....	1 E-05	-	-	4 E+05	-	-	ET/ /
Ba-142 .....	9 E-06	-	-	3 E+05	-	-	ET/ /
La-131 .....	1 E-05	8 E-06	-	4 E+05	3 E+05	-	ET/ET/
La-132 .....	1 E-06	1 E-06	-	5 E+04	5 E+04	-	ET/ET/
La-135 .....	1 E-05	1 E-05	-	4 E+05	4 E+05	-	ET/ET/
La-137 .....	4 E-08	2 E-07	-	1 E+03	8 E+03	-	L/L/
La-138 .....	3 E-09	1 E-08	-	1 E+02	4 E+02	-	St/St/
La-140 .....	4 E-07	3 E-07	-	1 E+04	1 E+04	-	ET/St/
La-141 .....	5 E-06	2 E-06	-	1 E+05	9 E+04	-	St/St/
La-142 .....	2 E-06	2 E-06	-	9 E+04	8 E+04	-	ET/ET/
La-143 .....	1 E-05	1 E-05	-	6 E+05	4 E+05	-	ET/ET/
Ce-134 .....	-	3 E-07	3 E-07	-	1 E+04	1 E+04	/St/
Ce-135 .....	-	5 E-07	5 E-07	-	2 E+04	2 E+04	/ET/ET
Ce-137m .....	-	1 E-06	9 E-07	-	3 E+04	3 E+04	/St/
Ce-137 .....	-	1 E-05	1 E-05	-	7 E+05	7 E+05	/ET/ET
Ce-139 .....	-	4 E-07	4 E-07	-	1 E+04	1 E+04	/St/
Ce-141 .....	-	2 E-07	1 E-07	-	7 E+03	6 E+03	/St/
Ce-143 .....	-	5 E-07	5 E-07	-	2 E+04	2 E+04	/St/
Ce-144 .....	-	2 E-08	1 E-08	-	9 E+02	7 E+02	/St/
Pr-136 .....	-	1 E-05	1 E-05	-	3 E+05	3 E+05	/ET/ET
Pr-137 .....	-	9 E-06	9 E-06	-	3 E+05	3 E+05	/ET/ET
Pr-138m .....	-	2 E-06	2 E-06	-	7 E+04	7 E+04	/ET/ET
Pr-139 .....	-	1 E-05	1 E-05	-	5 E+05	5 E+05	/ET/ET
Pr-142m .....	-	6 E-05	5 E-05	-	2 E+06	2 E+06	/St/
Pr-142 .....	-	8 E-07	7 E-07	-	2 E+04	2 E+04	/St/
Pr-143 .....	-	2 E-07	2 E-07	-	1 E+04	9 E+03	/St/
Pr-144 .....	-	1 E-05	1 E-05	-	4 E+05	4 E+05	/ET/ET
Pr-145 .....	-	2 E-06	2 E-06	-	8 E+04	8 E+04	/St/
Pr-147 .....	-	9 E-06	9 E-06	-	3 E+05	3 E+05	/ET/ET
Nd-136 .....	-	4 E-06	4 E-06	-	1 E+05	1 E+05	/ET/ET
Nd-138 .....	-	1 E-06	1 E-06	-	5 E+04	5 E+04	/St/
Nd-139m .....	-	1 E-06	1 E-06	-	5 E+04	5 E+04	/ET/ET
Nd-139 .....	-	1 E-05	1 E-05	-	6 E+05	6 E+05	/ET/ET
Nd-141 .....	-	3 E-05	3 E-05	-	1 E+06	1 E+06	/ET/ET
Nd-147 .....	-	2 E-07	2 E-07	-	1 E+04	9 E+03	/St/
Nd-149 .....	-	4 E-06	4 E-06	-	1 E+05	1 E+05	/ET/ET
Nd-151 .....	-	9 E-06	9 E-06	-	3 E+05	3 E+05	/ET/ET
Pm-141 .....	-	1 E-05	1 E-05	-	4 E+05	4 E+05	/ET/ET
Pm-143 .....	-	5 E-07	6 E-07	-	2 E+04	2 E+04	/St/
Pm-144 .....	-	1 E-07	1 E-07	-	3 E+03	5 E+03	/St/
Pm-145 .....	-	1 E-07	4 E-07	-	5 E+03	1 E+04	/BS/
Pm-146 .....	-	4 E-08	6 E-08	-	1 E+03	2 E+03	/St/
Pm-147 .....	-	1 E-07	1 E-07	-	4 E+03	6 E+03	/BS/

Radionuclide	Absorption type <sup>3</sup>			Absorption type <sup>3</sup>			Stochastic or organ or tissue <sup>1</sup>
	μCi/mL			Bq/m <sup>3</sup>			
	F	M	S	F	M	S	(F/M/S)
Pm-148m	-	1 E-07	1 E-07	-	5 E+03	4 E+03	/St/St
Pm-148	-	2 E-07	2 E-07	-	9 E+03	9 E+03	/St/St
Pm-149	-	7 E-07	6 E-07	-	2 E+04	2 E+04	/St/St
Pm-150	-	2 E-06	2 E-06	-	8 E+04	8 E+04	/ET/ET
Pm-151	-	9 E-07	8 E-07	-	3 E+04	3 E+04	/St/St
Sm-141m	-	5 E-06	-	-	2 E+05	-	/ET/
Sm-141	-	1 E-05	-	-	4 E+05	-	/ET/
Sm-142	-	4 E-06	-	-	1 E+05	-	/ET/
Sm-145	-	4 E-07	-	-	1 E+04	-	/BS/
Sm-146	-	2 E-11	-	-	1 E+00	-	/BS/
Sm-147	-	2 E-11	-	-	1 E+00	-	/BS/
Sm-151	-	7 E-08	-	-	2 E+03	-	/BS/
Sm-153	-	8 E-07	-	-	3 E+04	-	/St/
Sm-155	-	1 E-05	-	-	3 E+05	-	/ET/
Sm-156	-	2 E-06	-	-	7 E+04	-	/St/
Eu-145	-	5 E-07	-	-	2 E+04	-	/ET/
Eu-146	-	3 E-07	-	-	1 E+04	-	/ET/
Eu-147	-	5 E-07	-	-	2 E+04	-	/St/
Eu-148	-	2 E-07	-	-	9 E+03	-	/St/
Eu-149	-	2 E-06	-	-	9 E+04	-	/St/
Eu-150 (12 h)	-	2 E-06	-	-	7 E+04	-	/St/
Eu-150 (34 yr)	-	1 E-08	-	-	6 E+02	-	/St/
Eu-152m	-	1 E-06	-	-	6 E+04	-	/St/
Eu-152	-	2 E-08	-	-	7 E+02	-	/St/
Eu-154	-	1 E-08	-	-	5 E+02	-	/St/
Eu-155	-	7 E-08	-	-	2 E+03	-	/BS/
Eu-156	-	1 E-07	-	-	6 E+03	-	/St/
Eu-157	-	1 E-06	-	-	4 E+04	-	/St/
Eu-158	-	5 E-6	-	-	1 E+05	-	/ET/
Gd-145	9 E-06	7 E-06	-	3 E+05	2 E+05	-	ET/ET/
Gd-146	1 E-07	1 E-07	-	4 E+03	4 E+03	-	St/St/
Gd-147	7 E-07	6 E-07	-	2 E+04	2 E+04	-	ET/ET/
Gd-148	5 E-12	2 E-11	-	2 E-01	9 E-01	-	BS/BS/
Gd-149	1 E-06	7 E-07	-	4 E+04	2 E+04	-	St/St/
Gd-151	2 E-07	8 E-07	-	9 E+03	3 E+04	-	BS/St/
Gd-152	7 E-12	3 E-11	-	2 E-01	1 E+00	-	BS/BS/
Gd-153	9 E-08	4 E-07	-	3 E+03	1 E+04	-	BS/St/
Gd-159	3 E-06	1 E-06	-	1 E+05	5 E+04	-	St/St/
Tb-147	-	2 E-06	-	-	1 E+05	-	/ET/
Tb-149	-	1 E-07	-	-	6 E+03	-	/St/
Tb-150	-	2 E-06	-	-	8 E+04	-	/ET/
Tb-151	-	1 E-06	-	-	4 E+04	-	/ET/
Tb-153	-	2 E-06	-	-	8 E+04	-	/St/
Tb-154	-	5 E-07	-	-	2 E+04	-	/ET/
Tb-155	-	2 E-06	-	-	8 E+04	-	/St/
Tb-156m (24 h)	-	2 E-06	-	-	9 E+04	-	/St/
Tb-156m (5 h)	-	4 E-06	-	-	1 E+05	-	/St/
Tb-156	-	4 E-07	-	-	1 E+04	-	/E/
Tb-157	-	2 E-07	-	-	8 E+03	-	/BS/
Tb-158	-	1 E-08	-	-	6 E+02	-	/BS/
Tb-160	-	1 E-07	-	-	3 E+03	-	/St/
Tb-161	-	4 E-07	-	-	1 E+04	-	/St/
Dy-155	-	2 E-06	-	-	1 E+05	-	/ET/
Dy-157	-	5 E-06	-	-	1 E+05	-	/ET/
Dy-159	-	2 E-06	-	-	8 E+04	-	/BS/
Dy-165	-	6 E-06	-	-	2 E+05	-	/ET/
Dy-166	-	3 E-07	-	-	1 E+04	-	/St/
Ho-155	-	1 E-05	-	-	4 E+05	-	/ET/
Ho-157	-	2 E-05	-	-	1 E+06	-	/ET/
Ho-159	-	2 E-05	-	-	9 E+05	-	/ET/
Ho-161	-	3 E-05	-	-	1 E+06	-	/ET/
Ho-162m	-	9 E-06	-	-	3 E+05	-	/ET/
Ho-162	-	5 E-05	-	-	2 E+06	-	/ET/
Ho-164m	-	3 E-05	-	-	1 E+06	-	/St/
Ho-164	-	2 E-05	-	-	8 E+05	-	/ET/
Ho-166m	-	7 E-09	-	-	2 E+02	-	/St/
Ho-166	-	6 E-07	-	-	2 E+04	-	/St/
Ho-167	-	4 E-06	-	-	1 E+05	-	/ET/
Er-161	-	3 E-06	-	-	1 E+05	-	/ET/
Er-165	-	2 E-05	-	-	1 E+06	-	/ET/
Er-169	-	6 E-07	-	-	2 E+04	-	/St/



Radionuclide	Absorption type <sup>3</sup>			Absorption type <sup>3</sup>			Stochastic or organ or tissue <sup>1</sup>
	μCi/mL			Bq/m <sup>3</sup>			
	F	M	S	F	M	S	(F/M/S)
Er-171	-	1 E-06	-	-	6 E+04	-	/St/
Er-172	-	4 E-07	-	-	1 E+04	-	/St/
Tm-162	-	9 E-06	-	-	3E+05	-	/ET/
Tm-166	-	1 E-06	-	-	4 E+04	-	/ET/
Tm-167	-	5 E-07	-	-	2 E+04	-	/St/
Tm-170	-	1 E-07	-	-	4 E+03	-	/St/
Tm-171	-	2 E-07	-	-	9 E+03	-	/BS/
Tm-172	-	4 E-07	-	-	1 E+04	-	/St/
Tm-173	-	2 E-06	-	-	8 E+04	-	/St/
Tm-175	-	8 E-06	-	-	2 E+05	-	/ET/
Yb-162	-	1 E-05	1 E-05	-	5 E+05	5 E+05	/ET/ET
Yb-166	-	6 E-07	5 E-07	-	2 E+04	2 E+04	/St/St
Yb-167	-	3 E-05	3 E-05	-	1 E+06	1 E+06	/ET/ET
Yb-169	-	2 E-07	2 E-07	-	9 E+03	8 E+03	/St/St
Yb-175	-	8 E-07	8 E-07	-	3 E+04	2 E+04	/St/St
Yb-177	-	6 E-06	5 E-06	-	2 E+05	2 E+05	/ET/ET
Yb-178	-	5 E-06	5 E-06	-	1 E+05	1 E+05	/ET/E
Lu-169	-	9 E-07	9 E-07	-	3 E+04	3 E+04	/ET/ET
Lu-170	-	4 E-07	4 E-07	-	1 E+04	1 E+04	/ET/ET
Lu-171	-	6 E-07	6 E-07	-	2 E+04	2 E+04	/St/St
Lu-172	-	3 E-07	3 E-07	-	1 E+04	1 E+04	/St/St
Lu-173	-	2 E-07	4 E-07	-	8 E+03	1 E+04	/BS/St
Lu-174m	-	2 E-07	2 E-07	-	7 E+03	8 E+03	/BS/St
Lu-174	-	9 E-08	2 E-07	-	3 E+03	8 E+03	/BS/St
Lu-176m	-	3 E-06	3 E-06	-	1 E+05	1 E+05	/St/St
Lu-176	-	3 E-09	1 E-08	-	1 E+02	6 E+02	/BS/St
Lu-177m	-	5 E-08	4 E-08	-	2 E+03	1 E+03	/St/St
Lu-177	-	5 E-07	5 E-07	-	2 E+04	1 E+04	/St/St
Lu-178m	-	4 E-06	4 E-06	-	1 E+05	1 E+05	/ET/ET
Lu-178	-	8 E-06	8 E-06	-	3 E+05	3 E+05	/ET/ET
Lu-179	-	3 E-06	3 E-06	-	1 E+05	1 E+05	/St/St
Hf-170	1 E-06	1 E-06	-	4 E+04	4 E+04	-	ET/ET/
Hf-172	6 E-09	3 E-08	-	2 E+02	1 E+03	-	BS/BS/
Hf-173	2 E-06	2 E-06	-	9 E+04	8 E+04	-	ET/ET/
Hf-175	5 E-07	6 E-07	-	2 E+04	2 E+04	-	BS/St/
Hf-177m	2 E-06	1 E-06	-	9 E+04	6 E+04	-	ET/ET/
Hf-178m	8 E-10	4 E-09	-	3 E+01	1 E+02	-	BS/BS/
Hf-179m	2 E-07	1 E-07	-	8 E+03	6 E+03	-	BS/St/
Hf-180m	2 E-06	1 E-06	-	7 E+04	6 E+04	-	ET/ET/
Hf-181	1 E-07	1 E-07	-	4 E+03	5 E+03	-	BS/St/
Hf-182m	5 E-06	4 E-06	-	2 E+05	1 E+05	-	ET/ET/
Hf-182	5 E-10	2 E-09	-	2 E+01	9 E+01	-	BS/BS/
Hf-183	6 E-06	4 E-06	-	2 E+05	1 E+05	-	ET/ET/
Hf-184	1 E-06	1 E-06	-	5 E+04	4 E+04	-	ET/St/
Ta-172	-	5 E-06	5 E-06	-	1 E+05	1 E+05	/ET/ET
Ta-173	-	3 E-06	3 E-06	-	1 E+05	1 E+05	/E/E
Ta-174	-	5 E-06	5 E-06	-	2 E+05	2 E+05	/ET/ET
Ta-175	-	1 E-06	1 E-06	-	6 E+04	6 E+04	/ET/ET
Ta-176	-	1 E-06	1 E-06	-	3 E+04	3 E+04	/ET/ET
Ta-177	-	4 E-06	4 E-06	-	1 E+05	1 E+05	/St/St
Ta-178	-	3 E-06	3 E-06	-	1 E+05	1 E+05	/ET/ET
Ta-179	-	4 E-06	1 E-06	-	1 E+05	7 E+04	/St/St
Ta-180m	-	9 E-06	9 E-06	-	3 E+05	3 E+05	/St/St
Ta-180	-	1 E-07	4 E-08	-	4 E+03	1 E+03	/St/St
Ta-182m	-	6 E-06	6 E-06	-	2 E+05	2 E+05	/ET/ET
Ta-182	-	9 E-08	7 E-08	-	3 E+03	2 E+03	/St/St
Ta-183	-	3 E-07	2 E-07	-	1 E+04	1 E+04	/St/St
Ta-184	-	8 E-07	8 E-07	-	3 E+04	3 E+04	/ET/ET
Ta-185	-	5 E-06	5 E-06	-	2 E+05	1 E+05	/ET/ET
Ta-186	-	7 E-06	7 E-06	-	2 E+05	2 E+05	/ET/ET
W-176	3 E-06	-	-	1 E+05	-	-	ET/ /
W-177	5 E-06	-	-	2 E+05	-	-	ET/ /
W-178	3 E-06	-	-	1 E+05	-	-	ET/ /
W-179	1 E-04	-	-	5 E+06	-	-	ET/ /
W-181	1 E-05	-	-	4 E+05	-	-	ET/ /
W-185	2 E-06	-	-	9 E+04	-	-	St/ /
W-187	1 E-06	-	-	5 E+04	-	-	ET/ /
W-188	6 E-07	-	-	2 E+04	-	-	St/ /
Re-177	1 E-05	1 E-05	-	6 E+05	4 E+05	-	ET/ET/
Re-178	1 E-05	1 E-05	-	5 E+05	3 E+05	-	ET/ET/
Re-181	1 E-06	1 E-06	-	5 E+04	4 E+04	-	ET/ET/

Radionuclide	Absorption type <sup>3</sup>			Absorption type <sup>3</sup>			Stochastic or organ or tissue <sup>1</sup> (F/M/S)
	μCi/mL			Bq/m <sup>3</sup>			
	F	M	S	F	M	S	
Re-182 (64 h)	4 E-07	3 E-07	-	1 E+04	1 E+04	-	ET/St/
Re-182 (12 h)	1 E-06	1 E-06	-	4 E+04	4 E+04	-	ET/ET/
Re-184m	6 E-07	1 E-07	-	2 E+04	4 E+03	-	St/St/
Re-184	7 E-07	3 E-07	-	2 E+04	1 E+04	-	ET/St/
Re-186m	4 E-7	7 E-08	-	1 E+04	2 E+03	-	St/St/
Re-186	7 E-07	4 E-07	-	2 E+04	1 E+04	-	St/St/
Re-187	2 E-04	1 E-04	-	8 E+06	4 E+06	-	St/St/
Re-188m	3 E-05	2 E-05	-	1 E+06	1 E+06	-	St/St/
Re-188	8 E-07	7 E-07	-	3 E+04	2 E+04	-	St/St/
Re-189	1 E-06	9 E-07	-	4 E+04	3 E+04	-	St/St/
Os-180	1 E-05	1 E-05	1 E-05	5 E+05	3 E+05	3 E+05	ET/ET/ET
Os-181	3 E-06	3 E-06	3 E-06	1 E+05	1 E+05	1 E+05	ET/ET/ET
Os-182	1 E-06	9 E-07	9 E-07	3 E+04	3 E+04	3 E+04	ET/ET/ET
Os-185	4 E-07	5 E-07	5 E-07	1 E+04	2 E+04	1 E+04	St/St/St
Os-189m	1 E-04	7 E-05	7 E-05	4 E+06	2 E+06	2 E+06	St/St/St
Os-191m	1 E-05	4 E-06	4 E-06	5 E+05	1 E+05	1 E+05	St/St/St
Os-191	1 E-06	4 E-07	3 E-07	5 E+04	1 E+04	1 E+04	St/St/St
Os-193	2 E-06	8 E-07	8 E-07	7 E+04	3 E+04	3 E+04	St/St/St
Os-194	4 E-08	4 E-08	1 E-08	1 E+03	1 E+03	4 E+02	St/St/St
Ir-182	9 E-06	7 E-06	7 E-06	3 E+05	2 E+05	2 E+05	ET/ET/ET
Ir-184	1 E-06	1 E-06	1 E-06	7 E+04	6 E+04	7 E+04	ET/ET/ET
Ir-185	2 E-06	1 E-06	1 E-06	7 E+04	7 E+04	7 E+04	ET/ET/ET
Ir-186 (16 h) ..	8 E-07	7 E-07	7 E-07	2 E+04	2 E+04	2 E+04	ET/ET/ET
Ir-186 (2 h) .....	5 E-06	4 E-06	4 E-06	1 E+05	1 E+05	1 E+05	ET/ET/ET
Ir-187	4 E-06	3 E-06	3 E-06	1 E+05	1 E+05	1 E+05	ET/ET/ET
Ir-188	6 E-07	6 E-07	6 E-07	2 E+04	2 E+04	2 E+04	ET/ET/ET
Ir-189	3 E-06	1 E-06	1 E-06	1 E+05	5 E+04	4 E+04	St/St/St
Ir-190m (3 h) ..	2 E-06	2 E-06	2 E-06	8 E+04	8 E+04	7 E+04	ET/ET/ET
Ir-190m (1 h) ..	9 E-05	5 E-05	5 E-05	3 E+06	2 E+06	1 E+06	ET/St/St
Ir-190	4 E-07	2 E-07	2 E-07	1 E+04	9 E+03	8 E+03	ET/St/St
Ir-192m	1 E-07	1 E-07	2 E-08	3 E+03	6 E+03	1 E+03	St/St/St
Ir-192	2 E-07	1 E-07	1 E-07	9 E+03	5 E+03	4 E+03	St/St/St
Ir-194m	8 E-08	8 E-08	6 E-08	3 E+03	3 E+03	2 E+03	St/St/St
Ir-194	1 E-06	7 E-07	7 E-07	5 E+04	2 E+04	2 E+04	St/St/St
Ir-195m	2 E-06	2 E-06	2 E-06	9 E+04	7 E+04	7 E+04	ET/ET/ET
Ir-195	7 E-06	5 E-06	4 E-06	2 E+05	1 E+05	1 E+05	ET/ET/ET
Pt-186	3 E-06	-	-	1 E+05	-	-	ET/ /
Pt-188	8 E-07	-	-	3 E+04	-	-	E/ /
Pt-189	3 E-06	-	-	1 E+05	-	-	ET/ /
Pt-191	1 E-06	-	-	7 E+04	-	-	ET/ /
Pt-193m	2 E-06	-	-	8 E+04	-	-	ET/ /
Pt-193	2 E-05	-	-	7 E+05	-	-	ET/ /
Pt-195m	1 E-06	-	-	5 E+04	-	-	ET/ /
Pt-197m	7 E-06	-	-	2 E+05	-	-	ET/ /
Pt-197	3 E-06	-	-	1 E+05	-	-	ET/ /
Pt-199	1 E-05	-	-	4 E+05	-	-	ET/ /
Pt-200	1 E-06	-	-	5 E+04	-	-	St/ /
Au-193	4 E-06	3 E-06	3 E-06	1 E+05	1 E+05	1 E+05	ET/E/St
Au-194	9 E-07	9 E-07	9 E-07	3 E+04	3 E+04	3 E+04	ET/ET/ET
Au-195	3 E-06	7 E-07	4 E-07	1 E+05	2 E+04	1 E+04	ET/St/St
Au-198m	6 E-07	2 E-07	2 E-07	2 E+04	1 E+04	1 E+04	ET/St/St
Au-198	1 E-06	5 E-07	5 E-07	4 E+04	2 E+04	1 E+04	ET/St/St
Au-199	2 E-06	8 E-07	7 E-07	7 E+04	3 E+04	2 E+04	ET/St/St
Au-200m	5 E-07	4 E-07	4 E-07	1 E+04	1 E+04	1 E+04	ET/ET/ET
Au-200	1 E-05	7 E-06	7 E-06	4 E+05	2 E+05	2 E+05	ET/ET/ET
Au-201	1 E-05	1 E-05	9 E-06	5 E+05	3 E+05	3 E+05	ET/ET/ET
Hg-193m (Org)	1 E-06	-	-	4 E+04	-	-	ET/ /
Hg-193m	1 E-06	1 E-06	-	4 E+04	4 E+04	-	ET/ET/
Hg-193m (Vapor)	-	1 E-07	-	-	6 E+03	-	/St/
Hg-193 (Org) ..	5 E-06	-	-	1 E+05	-	-	ET/ /
Hg-193	5 E-06	4 E-06	-	1 E+05	1 E+05	-	ET/ET/
Hg-193 (Vapor)	-	5 E-07	-	-	1 E+04	-	/St/
Hg-194 (Org) ..	2 E-08	-	-	1 E+03	-	-	St/ /
Hg-194	3 E-08	1 E-07	-	1 E+03	3 E+03	-	St/St/
Hg-194 (Vapor)	-	1 E-08	-	-	5 E+02	-	/St/
Hg-195m (Org)	1 E-06	-	-	5 E+04	-	-	ET/ /
Hg-195m	1 E-06	8 E-07	-	5 E+04	3 E+04	-	ET/St/
Hg-195m (Vapor)	-	6 E-08	-	-	2 E+03	-	/St/
Hg-195 (Org) ..	6 E-06	-	-	2 E+05	-	-	ET/ /

Radionuclide	Absorption type <sup>3</sup>			Absorption type <sup>3</sup>			Stochastic or organ or tissue <sup>1</sup>
	μCi/mL			Bq/m <sup>3</sup>			
	F	M	S	F	M	S	(F/M/S)
Hg-195 .....	6 E-06	6 E-06	-	2 E+05	2 E+05	-	ET/ET/
Hg-195 (Vapor)	-	4 E-07	-	-	1 E+04	-	/St/
Hg-197m (Org)	1 E-06	-	-	5 E+04	-	-	ET/ /
Hg-197m .....	1 E-06	8 E-07	-	5 E+04	3 E+04	-	ET/St/
Hg-197m (Vapor)	-	9 E-08	-	-	3 E+03	-	/St/
Hg-197 (Org) ..	4 E-06	-	-	1 E+05	-	-	ET/ /
Hg-197 .....	4 E-06	2 E-06	-	1 E+05	7 E+04	-	ET/St/
Hg-197 (Vapor)	-	1 E-07	-	-	4 E+03	-	/St/
Hg-199m (Org)	8 E-06	-	-	3 E+05	-	-	ET/ /
Hg-199m .....	8 E-06	5 E-06	-	3 E+05	1 E+05	-	ET/ET/
Hg-199m (Vapor)	-	3 E-06	-	-	1 E+05	-	/St/
Hg-203 (Org) ..	7 E-07	-	-	2 E+04	-	-	St/ /
Hg-203 .....	9 E-07	2 E-07	-	3 E+04	1 E+04	-	St/St/
Hg-203 (Vapor)	-	8 E-08	-	-	2 E+03	-	/St/
Tl-194m .....	5 E-06	-	-	2 E+05	-	-	ET/ /
Tl-194 .....	2 E-05	-	-	8 E+05	-	-	ET/ /
Tl-195 .....	6 E-06	-	-	2 E+05	-	-	ET/ /
Tl-197 .....	8 E-06	-	-	2 E+05	-	-	ET/ /
Tl-198m .....	2 E-06	-	-	9 E+04	-	-	ET/ /
Tl-198 .....	1 E-06	-	-	5 E+04	-	-	ET/ /
Tl-199 .....	5 E-06	-	-	2 E+05	-	-	ET/ /
Tl-200 .....	8 E-07	-	-	3 E+04	-	-	ET/ /
Tl-201 .....	4 E-06	-	-	1 E+05	-	-	ET/ /
Tl-202 .....	1 E-06	-	-	5 E+04	-	-	ET/ /
Tl-204 .....	9 E-07	-	-	3 E+04	-	-	St/ /
Pb-195m .....	7 E-06	-	-	2 E+05	-	-	ET/ /
Pb-198 .....	2 E-06	-	-	9 E+04	-	-	ET/ /
Pb-199 .....	4 E-06	-	-	1 E+05	-	-	ET/ /
Pb-200 .....	1 E-06	-	-	4 E+04	-	-	ET/ /
Pb-201 .....	2 E-06	-	-	7 E+04	-	-	ET/ /
Pb-202m .....	1 E-06	-	-	6 E+04	-	-	ET/ /
Pb-202 .....	4 E-08	-	-	1 E+03	-	-	St/ /
Pb-203 .....	2 E-06	-	-	7 E+04	-	-	ET/ /
Pb-205 .....	9 E-07	-	-	3 E+04	-	-	BS/ /
Pb-209 .....	9 E-06	-	-	3 E+05	-	-	ET/ /
Pb-210 .....	1 E-10	-	-	5 E+00	-	-	BS/ /
Pb-211 .....	4 E-08	-	-	1 E+03	-	-	ET/ /
Pb-212 .....	5 E-09	-	-	2 E+02	-	-	ET/ /
Pb-214 .....	4 E-08	-	-	1 E+03	-	-	ET/ /
Bi-200 .....	5 E-06	4 E-06	-	2 E+05	1 E+05	-	ET/ET/
Bi-201 .....	3 E-06	2 E-06	-	1 E+05	1 E+05	-	ET/ET/
Bi-202 .....	2 E-06	2 E-06	-	9 E+04	9 E+04	-	ET/ET/
Bi-203 .....	7 E-07	7 E-07	-	2 E+04	2 E+04	-	ET/ET/
Bi-205 .....	4 E-07	4 E-07	-	1 E+04	1 E+04	-	ET/ET/
Bi-206 .....	2 E-07	2 E-07	-	9 E+03	8 E+03	-	ET/ET/
Bi-207 .....	4 E-07	1 E-07	-	1 E+04	6 E+03	-	ET/St/
Bi-210m .....	3 E-09	2 E-10	-	1 E+02	9 E+00	-	K/St/
Bi-210 .....	1 E-07	9 E-09	-	6 E+03	3 E+02	-	K/St/
Bi-212 .....	1 E-08	8 E-09	-	4 E+02	3 E+02	-	ET/ET/
Bi-213 .....	1 E-08	7 E-09	-	4 E+02	2 E+02	-	ET/ET/
Bi-214 .....	1 E-08	1 E-08	-	6 E+02	4 E+02	-	ET/ET/
Po-203 .....	5 E-06	4 E-06	-	1 E+05	1 E+05	-	ET/ET/
Po-205 .....	4 E-06	3 E-06	-	1 E+05	1 E+05	-	ET/ET/
Po-207 .....	1 E-06	1 E-06	-	7 E+04	6 E+04	-	ET/ET/
Po-210 .....	7 E-10	2 E-10	-	2 E+01	9 E+00	-	K/St/
At-207 .....	1 E-06	2 E-07	-	4 E+04	1 E+04	-	St/St/
At-211 .....	7 E-09	5 E-09	-	2 E+02	1 E+02	-	ET/St/
Rn-220 <sup>5</sup> .....	1 E-08	-	-	6 E+02	-	-	-
Rn-222 <sup>5</sup> .....	8 E-08	-	-	3 E+03	-	-	-
Fr-222 .....	1 E-08	-	-	3 E+02	-	-	ET/ /
Fr-223 .....	4 E-07	-	-	1 E+04	-	-	St/ /
Ra-223 .....	-	9 E-11	-	-	3 E+00	-	/St/
Ra-224 .....	-	2 E-10	-	-	8 E+00	-	/St/
Ra-225 .....	-	1 E-10	-	-	4 E+00	-	/St/
Ra-226 .....	-	2 E-10	-	-	9 E+00	-	/St/
Ra-227 .....	-	8 E-07	-	-	3 E+04	-	/BS/
Ra-228 .....	-	1 E-10	-	-	5 E+00	-	/BS/
Ac-224 .....	1 E-08	6 E-09	5 E-09	6 E+02	2 E+02	2 E+02	BS/St/St
Ac-225 .....	2 E-10	9 E-11	8 E-11	7 E+00	3 E+00	3 E+00	BS/St/St

Radionuclide	Absorption type <sup>3</sup>			Absorption type <sup>3</sup>			Stochastic or organ or tissue <sup>1</sup> (F/M/S)
	μCi/mL			Bq/m <sup>3</sup>			
	F	M	S	F	M	S	
Ac-226	1 E-09	6 E-10	5 E-10	4 E+01	2 E+01	2 E+01	ET/St/St
Ac-227	2 E-13	1 E-12	1 E-11	1 E-02	5 E-02	4 E-01	BS/BS/St
Ac-228	6 E-09	3 E-08	4 E-08	2 E+02	1 E+03	1 E+03	BS/BS/St
Th-226	-	4 E-09	4 E-09	-	1 E+02	1 E+02	/ET/ET
Th-227	-	9 E-11	7 E-11	-	3 E+00	2 E+00	/St/St
Th-228	-	2 E-11	2 E-11	-	7 E-01	8 E-01	/BS/St
Th-229	-	2 E-12	1 E-11	-	7 E-02	4 E-01	/BS/St
Th-230	-	3 E-12	4 E-11	-	1 E-01	1 E+00	/BS/BS
Th-231	-	1 E-06	1 E-06	-	5 E+04	5 E+04	/St/St
Th-232	-	3 E-12	4 E-11	-	1 E-01	1 E+00	/BS/BS
Th-234	-	1 E-07	9 E-08	-	3 E+03	3 E+03	/St/St
Pa-227	-	4 E-09	4 E-09	-	1 E+02	1 E+02	/ET/ET
Pa-228	-	1 E-08	1 E-08	-	3 E+02	4 E+02	/BS/St
Pa-230	-	1 E-09	9 E-10	-	4 E+01	3 E+01	/St/St
Pa-231	-	1 E-12	1 E-11	-	4 E-02	4 E-01	/BS/BS
Pa-232	-	1 E-08	1 E-07	-	6 E+02	7 E+03	/BS/BS
Pa-233	-	2 E-07	1 E-07	-	7 E+03	6 E+03	/St/St
Pa-234	-	7 E-07	7 E-07	-	2 E+04	2 E+04	/ET/ET
U-230	6 E-10	5 E-11	4 E-11	2 E+01	2 E+00	1 E+00	K/St/St
U-231	2 E-06	1 E-06	1 E-06	8 E+04	4 E+04	4 E+04	ET/St/St
U-232	5 E-11	1 E-10	2 E-11	2 E+00	4 E+00	7 E-01	BS/St/ET
U-233	4 E-10	2 E-10	7 E-11	1 E+01	9 E+00	2 E+00	BS/St/ET
U-234	5 E-10	2 E-10	7 E-11	1 E+01	9 E+00	2 E+00	BS/St/ET
U-235	5 E-10	3 E-10	8 E-11	1 E+01	1 E+01	3 E+00	BS/St/ET
U-236	5 E-10	2 E-10	7 E-11	1 E+01	1 E+01	2 E+00	BS/St/ET
U-237	1 E-06	3 E-07	3 E-07	4 E+04	1 E+04	1 E+04	ET/St/St
U-238	5 E-10	3 E-10	8 E-11	2 E+01	1 E+01	3 E+00	BS/St/ET
U-239	1 E-05	9 E-06	9 E-06	5 E+05	3 E+05	3 E+05	ET/ET/ET
U-240	1 E-06	7 E-07	6 E-07	5 E+04	2 E+04	2 E+04	ET/St/St
Np-232	-	3 E-06	-	-	1 E+05	-	/BS/
Np-233	-	7 E-05	-	-	2 E+06	-	/ET/
Np-234	-	5 E-07	-	-	2 E+04	-	/ET/
Np-235	-	1 E-06	-	-	4 E+04	-	/BS/
Np-236 (1 E+05 yr)	-	4 E-11	-	-	1 E+00	-	/BS/
Np-236 (22 h)	-	5 E-08	-	-	1 E+03	-	/BS/
Np-237	-	8 E-12	-	-	3 E-01	-	/BS/
Np-238	-	1 E-07	-	-	4 E+03	-	/BS/
Np-239	-	5 E-07	-	-	1 E+04	-	/St/
Np-240	-	2 E-06	-	-	8 E+04	-	/ET/
Pu-234	-	3 E-08	3 E-08	-	1 E+03	1 E+03	/St/St
Pu-235	-	9 E-05	8 E-05	-	3 E+06	3 E+06	/ET/ET
Pu-236	-	1 E-11	7 E-11	-	6 E-01	2 E+00	/BS/St
Pu-237	-	1 E-06	1 E-06	-	7 E+04	6 E+04	/St/St
Pu-238	-	6 E-12	5 E-11	-	2 E-01	1 E+00	/BS/St
Pu-239	-	5 E-12	6 E-11	-	2 E-01	2 E+00	/BS/BS
Pu-240	-	5 E-12	6 E-11	-	2 E-01	2 E+00	/BS/BS
Pu-241	-	2 E-10	2 E-09	-	1 E+01	1 E+02	/BS/BS
Pu-242	-	5 E-12	6 E-11	-	2 E-01	2 E+00	/BS/BS
Pu-243	-	5 E-06	5 E-06	-	1 E+05	1 E+05	/E/E
Pu-244	-	5 E-12	6 E-11	-	2 E-01	2 E+00	/BS/BS
Pu-245	-	9 E-07	8 E-07	-	3 E+04	3 E+04	/St/St
Pu-246	-	8 E-08	8 E-08	-	3 E+03	2 E+03	/St/St
Am-237	-	8 E-06	-	-	3 E+05	-	/ET/
Am-238	-	2 E-06	-	-	9 E+04	-	/BS/
Am-239	-	1 E-06	-	-	6 E+04	-	/ET/
Am-240	-	7 E-07	-	-	2 E+04	-	/ET/
Am-241	-	5 E-12	-	-	1 E-01	-	/BS/
Am-242m	-	5 E-12	-	-	1 E-01	-	/BS/
Am-242	-	4 E-08	-	-	1 E+03	-	/St/
Am-243	-	5 E-12	-	-	1 E-01	-	/BS/
Am-244m	-	3 E-06	-	-	1 E+05	-	/BS/
Am-244	-	1 E-07	-	-	5 E+03	-	/BS/
Am-245	-	5 E-06	-	-	2 E+05	-	/ET/
Am-246m	-	6 E-06	-	-	2 E+05	-	/ET/
Am-246	-	2 E-06	-	-	9 E+04	-	/ET/
Cm-238	-	1 E-07	-	-	4 E+03	-	/St/
Cm-240	-	2 E-10	-	-	7 E+00	-	/St/
Cm-241	-	2 E-08	-	-	8 E+02	-	/St/
Cm-242	-	1 E-10	-	-	5 E+00	-	/St/
Cm-243	-	7 E-12	-	-	2 E-01	-	/BS/

Radionuclide	Absorption type <sup>3</sup>			Absorption type <sup>3</sup>			Stochastic or organ or tissue <sup>1</sup>
	μCi/mL			Bq/m <sup>3</sup>			
	F	M	S	F	M	S	(F/M/S)
Cm-244	-	9 E-12	-	-	3 E-01	-	/BS/
Cm-245	-	5 E-12	-	-	1 E-01	-	/BS/
Cm-246	-	5 E-12	-	-	1 E-01	-	/BS/
Cm-247	-	5 E-12	-	-	2 E-01	-	/BS/
Cm-248	-	1 E-12	-	-	5 E-02	-	/BS/
Cm-249	-	8 E-06	-	-	3 E+05	-	/ET/
Cm-250	-	2 E-13	-	-	8 E-03	-	/BS/
Bk-245	-	3 E-07	-	-	1 E+04	-	/St/
Bk-246	-	8 E-07	-	-	3 E+04	-	/ET/
Bk-247	-	3 E-12	-	-	1 E-01	-	/BS/
Bk-249	-	1 E-09	-	-	5 E+01	-	/BS/
Bk-250	-	2 E-07	-	-	9 E+03	-	/BS/
Cf-244	-	1 E-08	-	-	5 E+02	-	/ET/
Cf-246	-	1 E-09	-	-	5 E+01	-	/St/
Cf-248	-	5 E-11	-	-	2 E+00	-	/BS/
Cf-249	-	3 E-12	-	-	1 E-01	-	/BS/
Cf-250	-	7 E-12	-	-	2 E-01	-	/BS/
Cf-251	-	3 E-12	-	-	1 E-01	-	/BS/
Cf-252	-	1 E-11	-	-	6 E-01	-	/BS/
Cf-253	-	5 E-10	-	-	2 E+01	-	/St/
Cf-254	-	2 E-11	-	-	8 E-01	-	/BS/
Es-250	-	4 E-07	-	-	1 E+04	-	/BS/
Es-251	-	3 E-07	-	-	1 E+04	-	/St/
Es-253	-	2 E-10	-	-	9 E+00	-	/St/
Es-254m	-	1 E-09	-	-	5 E+01	-	/St/
Es-254	-	6 E-11	-	-	2 E+00	-	/BS/
Fm-252	-	2 E-09	-	-	8 E+01	-	/St/
Fm-253	-	1 E-09	-	-	6 E+01	-	/St/
Fm-254	-	6 E-09	-	-	2 E+02	-	/ET/
Fm-255	-	2 E-09	-	-	8 E+01	-	/St/
Fm-257	-	1 E-10	-	-	4 E+00	-	/St/
Md-257	-	2 E-08	-	-	1 E+03	-	/St/
Md-258	-	1 E-10	-	-	4 E+00	-	/St/

FOOTNOTES FOR APPENDIX A

<sup>1</sup>A determination of whether the DACs are controlled by stochastic (St) or deterministic (organ or tissue) dose, or if they both give the same result (E), for each absorption type, is given in this column. The key to the organ notation for deterministic dose is: BS = Bone surface, ET = Extrathoracic, K = Kidney, L = Liver, and T = Thyroid. A blank indicates that no calculations were performed for the absorption type shown.

<sup>2</sup>The ICRP identifies these materials as soluble or reactive gases and vapors or highly soluble or reactive gases and vapors. For tritiated water, the inhalation DAC values allow for an additional 50% absorption through the skin, as described in ICRP Publication No. 68, Dose Coefficients for Intakes of Radionuclides by Workers. For elemental tritium, the DAC values include a factor that irradiation from gas within the lungs might increase the dose by 20%.

<sup>3</sup>A dash indicates no values given for this data category.

<sup>4</sup>DAC values derived using hafnium tritide particle and are based on "observed activity" (i.e., only radiation emitted from the particle is considered). DAC values derived

using methodology found in Radiological Control Programs for Special Tritium Compounds, DOE-HDEK-1184-2004.

<sup>5</sup>These values are appropriate for protection from radon combined with its short-lived decay products and are based on information given in ICRP Publication 65: Protection Against Radon-222 at Home and at Work and in DOE-STD-1121-98: Internal Dosimetry. The values given are for 100% equilibrium concentration conditions of the short-lived radon decay products with the parent. To allow for an actual measured equilibrium concentration or a demonstrated equilibrium concentration, the values given in this table should be multiplied by the ratio (100%/actual %) or (100%/demonstrated %), respectively. Alternatively, the DAC values for Rn-220 and Rn-222 may be replaced by 2.5 working level (WL) and 0.83 WL, respectively, for appropriate limiting of decay product concentrations. A WL is any combination of short-lived radon decay products, in one liter of air without regard to the degree of equilibrium, that will result in the ultimate emission of 1.3 E+05 MeV of alpha energy.

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