

Part III
Appendix B
RHA 3.53 Annual Limits on Intake (ALIs) and Derived Air
Concentrations (DACs) of Radionuclides for Occupational Exposure;
Effluent Concentrations; Concentrations for Release to Sewerage

Atomic Radionuclide No.	Class	Table 1 Occupational Values			Table 2 Effluent Concentrations		Table 3 Releases to Sewers
		Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Conc. (uCi/ml)
		Oral Ingestion ALI (uCi)	<u>Inhalation</u> ALI (uCi) DAC (uCi/ml)		Air (uCi/ml)	Water (uCi/ml)	
1 Hydrogen-3	Water, DAC includes skin absorption Gas (HT or T ₂)Submersion ¹ : Use above values as HT and T ₂ oxidize in air and in the body to HTO.	8E+4	8E+4	2E-5	1E-7	1E-3	1E-2
4 Beryllium-7	W, all compounds except those given for Y	4E+4	2E+4	9E-6	3E-8	6E-4	6E-3
	Y, oxides, halides, and nitrates -	-	2E+4	8E-6	3E-8	-	-
4 Beryllium-10	W, see ⁷ Be	1E+3 LLI wall (1E+3)	2E+2	6E-8	2E-10	- 2E-5	- 2E-4
	Y, see ⁷ Be	-	1E+1	6E-9	2E-11	-	-
6 Carbon-11 ²	Monoxide	-	1E+6	5E-4	2E-6	-	-
	Dioxide	-	6E+5	3E-4	9E-7	-	-
	Compounds	4E+5	4E+5	2E-4	6E-7	6E-3	6E-2
6 Carbon-14	Monoxide	-	2E+6	7E-4	2E-6	-	-
	Dioxide	-	2E+5	9E-5	3E-7	-	-
	Compounds	2E+3	2E+3	1E-6	3E-9	3E-5	3E-4
7 Nitrogen-13 ²	Submersion ¹			4E-6	2E-8		
8 Oxygen-15 ²	Submersion ¹			4E-6	2E-8		
9 Fluorine-18 ²	D, fluorides of H, Li, Na, K, Rb, Cs, and Fr (5E+4)	5E+4 St. wall	7E+4	3E-5	1E-7	-	-
	W, fluorides of Be,	-	-	-	7E-4	7E-3	

	Mg, Ca, Sr, Ba, Ra, Al, Ga, In, Tl, As, Sb, Bi, Fe, Ru, Os, Co, Ni, Pd, Pt, Cu, Ag, Au, Zn, Cd, Hg, Sc, Y, Ti, Zr, V, Nb, Ta, Mn, Tc, and Re	-	9E+4	4E-5	1E-7	-	-
	Y, lanthanum fluoride	-	8E+4	3E-5	1E-7	-	-
11 Sodium-22	D, all compounds	4E+2	6E+2	3E-7	9E-10	6E-6	6E-5
11 Sodium-24	D, all compounds	4E+3	5E+3	2E-6	7E-9	5E-5	5E-4
12 Magnesium-28	D, all compounds except those given for W	7E+2	2E+3	7E-7	2E-9	9E-6	9E-5
	W, oxides, hydroxides, carbides, halides, & nitrates	-	1E+3	5E-7	2E-9	-	-
13 Aluminum-26	D, all compounds except those given for W	4E+2	6E+1	3E-8	9E-11	6E-6	6E-5
	W, oxides, hydroxides, carbides, halides, & nitrates	-	9E+1	4E-8	1E-10	-	-
14 Silicon-31	D, all compounds except those given for W and Y	9E+3	3E+4	1E-5	4E-8	1E-4	1E-3
	W, oxides, hydroxides, carbides, & nitrates	-	3E+4	1E-5	5E-8	-	-
	Y, aluminosilicate glass	-	3E+4	1E-5	4E-8	-	-
14 Silicon-32	D, see ³¹ Si LLI wall (3E+3)	2E+3	2E+2	1E-7	3E-10	-	-
	W, see ³¹ Si	-	-	-	4E-5	-	4E-4
	Y, see ³¹ Si	-	1E+2	5E-8	2E-10	-	-
	Y, see ³¹ Si	-	5E+0	2E-9	7E-12	-	-
15 Phosphorus-32	D, all compounds						

	except phosphates given for W	6E+2	9E+2	4E-7	1E-9	9E-6	9E-5
	W, phosphates of Zn ²⁺ , S ³⁺ , Mg ²⁺ , Fe ³⁺ , Bi ³⁺ , and lanthanides	-	4E+2	2E-7	5E-10	-	-
15 Phosphorus-33	D, see ³² p	6E+3	8E+3	4E-6	1E-8	8E-5	8E-4
	W, see ³² p	-	3E+3	1E-6	4E-9	-	-
16 Sulfur-35	Vapor	-	1E+4	6E-6	2E-8	-	-
	D, sulfides and sulfates except those given for W	1E+4	2E+4	7E-6	2E-8	-	-
	LLI wall (8E+3)	-	-	-	-	1E-4	1E-3
	W, elemental sulfur, sulfides of Sr, Ba, Ge, Sn, Pb, As, Sb, Bi, Cu, Ag, Au, Zn, Cd, Hg, W, and Mo. Sulfates of Ca, Sr, Ba, Ra, As, Sb, and Bi	6E+3					
		-	2E+3	9E-7	3E-9	-	-
17 Chlorine-36	D, chlorides of H, Li, Na, K, Rb, Cs, and Fr	2E+3	2E+3	1E-6	3E-9	2E-5	2E-4
	W, chlorides of lanthanides, Be, Mg, Ca, Sr, Ba, Ra, Al, Ga, In, Tl, Ge, Sn, Pb, As, Sb, Bi, Fe, Ru, Os, Co, Rh, Ir, Ni, Pd, Pt, Cu, Ag, Au, Zn, Cd, Hg, Sc, Y, Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Tc, and Re	-	2E+2	1E-7	3E-10	-	-
17 Chlorine-38 ²	D, see ³⁶ C1	2E+4	4E+4	2E-5	6E-8	-	-
	St. wall (3E+4)	-	-	-	-	3E-4	3E-3
	W, see ³⁶ C1	-	5E+4	2E-5	6E-8	-	-
17 Chlorine-39 ²	D, see ³⁶ C1	2E+4	5E+4	2E-5	7E-8	-	-

		St. wall (4E+4)	-	-	-	5E-4	5E-3
	W, see ³⁶ C1	-	6E+4	2E-5	8E-8	-	-
18 Argon-37	Submersion ¹	-	-	1E+0	6E-3	-	-
18 Argon-39	Submersion ¹	-	-	2E-4	8E-7	-	-
18 Argon-41	Submersion ¹	-	-	3E-6	1E-8	-	-
19 Potassium-40	D, all compounds	3E+2	4E+2	2E-7	6E-10	4E-6	4E-5
19 Potassium-42	D, all compounds	5E+3	5E+3	2E-6	7E-9	6E-5	6E-4
19 Potassium-43	D, all compounds	6E+3	9E+3	4E-6	1E-8	9E-5	9E-4
19 Potassium-44 ²	D, all compounds	2E+4	7E+4	3E-5	9E-8	-	-
		St. wall (4E+4)	-	-	-	5E-4	5E-3
19 Potassium-45 ²	D, all compounds	3E+4	1E+5	5E-5	2E-7	-	-
		St. wall (5E+4)	-	-	-	7E-4	7E-3
20 Calcium-41	W, all compounds	3E+3	4E+3	2E-6	-	-	-
		Bone surf (4E+3)	Bone surf (4E+3)	-	5E-9	6E-5	6E-4
20 Calcium-45	W, all compounds	2E+3	8E+2	4E-7	1E-9	2E-5	2E-4
20 Calcium-47	W, all compounds	8E+2	9E+2	4E-7	1E-9	1E-5	1E-4
21 Scandium-43	Y, all compounds	7E+3	2E+4	9E-6	3E-8	1E-4	1E-3
21 Scandium-44mY, all compounds		5E+2	7E+2	3E-7	1E-9	7E-6	7E-5
21 Scandium-44	Y, all compounds	4E+3	1E+4	5E-6	2E-8	5E-5	5E-4
21 Scandium-46	Y, all compounds	9E+2	2E+2	1E-7	3E-10	1E-5	1E-4
21 Scandium-47	Y, all compounds	2E+3	3E+3	1E-6	4E-9	-	-
		LLI wall (3E+3)	-	-	-	4E-5	4E-4
21 Scandium-48	Y, all compounds	8E+2	1E+3	6E-7	2E-9	1E-5	1E-4
21 Scandium-49 ²	Y, all compounds	2E+4	5E+4	2E-5	8E-8	3E-4	3E-3

22 Titanium-44	D, all compounds except those given for W and Y	3E+2	1E+1	5E-9	2E-11	4E-6	4E-5
	W, oxides, hydroxides, carbides, halides, & nitrates	-	3E+1	1E-8	4E-11	-	-
	Y, SrTiO ₃	-	6E+0	2E-9	8E-12	-	-
22 Titanium-45	D, see ⁴⁴ Ti	9E+3	3E+4	1E-5	3E-8	1E-4	1E-3
	W, see ⁴⁴ Ti	-	4E+4	1E-5	5E-8	-	-
	Y, see ⁴⁴ Ti	-	3E+4	1E-5	4E-8	-	-
23 Vanadium-47 ²	D, all compounds except those given for W	3E+4 St. wall (3E+4)	8E+4 -	3E-5 -	1E-7 -	- 4E-4	- 4E-3
	W, oxides, hydroxides, carbides, and halides	-	1E+5	4E-5	1E-7	-	-
23 Vanadium-48	D, see ⁴⁷ V	6E+2	1E+3	5E-7	2E-9	9E-6	9E-5
	W, see ⁴⁷ V	-	6E+2	3E-7	9E-10	-	-
23 Vanadium-49	D, see ⁴⁷ V	7E+4 LLI wall (9E+4)	3E+4 Bone surf (3E+4)	1E-5 -	- 5E-8	- 1E-3	- 1E-2
	W, see ⁴⁷ V	-	2E+4	8E-6	2E-8	-	-
24 Chromium-48	D, all compounds except those given for W and Y	6E+3	1E+4	5E-6	2E-8	8E-5	8E-4
	W, halides and nitrates	-	7E+3	3E-6	1E-8	-	-
	Y, oxides and hydroxides	-	7E+3	3E-6	1E-8	-	-
24 Chromium-49 ²	D, see ⁴⁸ Cr	3E+4	8E+4	4E-5	1E-7	4E-4	4E-3
	W, see ⁴⁸ Cr	-	1E+5	4E-5	1E-7	-	-
	Y, see ⁴⁸ Cr	-	9E+4	4E-5	1E-7	-	-
24 Chromium-51	D, see ⁴⁸ Cr	4E+4	5E+4	2E-5	6E-8	5E-4	5E-3
	W, see ⁴⁸ Cr	-	2E+4	1E-5	3E-8	-	-

	Y, see ⁴⁸ Cr	-	2E+4	8E-6	3E-8	-	-
25 Manganese-51 ²	D, all compounds except those given for W,	2E+4	5E+4	2E-5	7E-8	3E-4	3E-3
	W, oxides, hydroxides, halides, & nitrates	-	6E+4	3E-5	8E-8	-	-
25 Manganese-52m ²	D, see ⁵¹ Mn	3E+4	9E+4	4E-5	1E-7	-	-
	St. wall (4E+4)	-	-	-	-	5E-4	5E-3
	W, see ⁵¹ Mn	-	1E+5	4E-5	1E-7	-	-
25 Manganese-52	D, see ⁵¹ Mn	7E+2	1E+3	5E-7	2E-9	1E-5	1E-4
	W, see ⁵¹ Mn	-	9E+2	4E-7	1E-9	-	-
25 Manganese-53	D, see ⁵¹ Mn	5E+4	1E+4	5E-6	-	7E-4	7E-3
	Bone surf (2E+4)	-	-	-	3E-8	-	-
	W, see ⁵¹ Mn	-	1E+4	5E-6	2E-8	-	-
25 Manganese-54	D, see ⁵¹ Mn	2E+3	9E+2	4E-7	1E-9	3E-5	3E-4
	W, see ⁵¹ Mn	-	8E+2	3E-7	1E-9	-	-
25 Manganese-56	D, see ⁵¹ Mn	5E+3	2E+4	6E-6	2E-8	7E-5	7E-4
	W, see ⁵¹ Mn	-	2E+4	9E-6	3E-8	-	-
26 Iron-52	D, all compounds except those given for W	9E+2	3E+3	1E-6	4E-9	1E-5	1E-4
	W, oxides, hydroxides, and halides	-	2E+3	1E-6	3E-9	-	-
26 Iron-55	D, see ⁵² Fe	9E+3	2E+3	8E-7	3E-9	1E-4	1E-3
	W, see ⁵² Fe	-	4E+3	2E-6	6E-9	-	-
26 Iron-59	D, see ⁵² Fe	8E+2	3E+2	1E-7	5E-10	1E-5	1E-4
	W, see ⁵² Fe	-	5E+2	2E-7	7E-10	-	-
26 Iron-60	D, see ⁵² Fe	3E+1	6E+0	3E-9	9E-12	4E-7	4E-6
	W, see ⁵² Fe	-	2E+1	8E-9	3E-11	-	-
27 Cobalt-55	W, all compounds except those given for Y	1E+3	3E+3	1E-6	4E-9	2E-5	2E-4

	Y, oxides, hydroxides, halides, and nitrates	-	3E+3	1E-6	4E-9	-	-
27 Cobalt-56	W, see ⁵⁵ Co Y, see ⁵⁵ Co	5E+2 4E+2	3E+2 2E+2	1E-7 8E-8	4E-10 3E-10	6E-6 -	6E-5 -
27 Cobalt-57	W, see ⁵⁵ Co Y, see ⁵⁵ Co	8E+3 4E+3	3E+3 7E+2	1E-6 3E-7	4E-9 9E-10	6E-5 -	6E-4 -
27 Cobalt-58m	W, see ⁵⁵ Co Y, see ⁵⁵ Co	6E+4 -	9E+4 6E+4	4E-5 3E-5	1E-7 9E-8	8E-4 -	8E-3 -
27 Cobalt-58	W, see ⁵⁵ Co Y, see ⁵⁵ Co	2E+3 1E+3	1E+3 7E+2	5E-7 3E-7	2E-9 1E-9	2E-5 -	2E-4 -
27 Cobalt-60m ²	W, see ⁵⁵ Co	1E+6	4E+6	2E-3	6E-6	-	-
	St. wall (1E+6)	-	-	-	-	2E-2	2E-1
	Y, see ⁵⁵ Co	-	3E+6	1E-3	4E-6	-	-
27 Cobalt-60	W, see ⁵⁵ Co Y, see ⁵⁵ Co	5E+2 2E+2	2E+2 3E+1	7E-8 1E-8	2E-10 5E-11	3E-6 -	3E-5 -
27 Cobalt-61 ²	W, see ⁵⁵ Co Y, see ⁵⁵ Co	2E+4 2E+4	6E+4 6E+4	3E-5 2E-5	9E-8 8E-8	3E-4 -	3E-3 -
27 Cobalt-62m ²	W, see ⁵⁵ Co	4E+4	2E+5	7E-5	2E-7	-	-
	St. wall (5E+4)	-	-	-	-	7E-4	7E-3
	Y, see ⁵⁵ Co	-	2E+5	6E-5	2E-7	-	-
28 Nickel-56	D, all compounds except those given for W	1E+3	2E+3	8E-7	3E-9	2E-5	2E-4
	W, oxides, hydroxides and carbides	-	1E+3	5E-7	2E-9	-	-
	Vapor	-	1E+3	5E-7	2E-9	-	-
28 Nickel-57	D, see ⁵⁶ Ni W, see ⁵⁶ Ni Vapor	2E+3 - -	5E+3 3E+3 6E+3	2E-6 1E-6 3E-6	7E-9 4E-9 9E-9	2E-5 - -	2E-4 - -
28 Nickel-59	D, see ⁵⁶ Ni W, see ⁵⁶ Ni Vapor	2E+4 - -	4E+3 7E+3 2E+3	2E-6 3E-6 8E-7	5E-9 1E-8 3E-9	3E-4 - -	3E-3 - -

28 Nickel-63	D, see ⁵⁶ Ni	9E+3	2E+3	7E-7	2E-9	1E-4	1E-3
	W, see ⁵⁶ Ni	-	3E+3	1E-6	4E-9	-	-
	Vapor	-	8E+2	3E-7	1E-9	-	-
28 Nickel-65	D, see ⁵⁶ Ni	8E+3	2E+4	1E-5	3E-8	1E-4	1E-3
	W, see ⁵⁶ Ni	-	3E+4	1E-5	4E-8	-	-
	Vapor	-	2E+4	7E-6	2E-8	-	-
28 Nickel-66	D, see ⁵⁶ Ni	4E+2	2E+3	7E-7	2E-9	-	-
	LLI wall (5E+2)	-	-	-	-	6E-6	6E-5
	W, see ⁵⁶ Ni	-	6E+2	3E-7	9E-10	-	-
29 Copper-60 ²	Vapor	-	3E+3	1E-6	4E-9	-	-
	D, all compounds except those given for W and Y	3E+4	9E+4	4E-5	1E-7	-	-
	St. wall (3E+4)	-	-	-	-	4E-4	4E-3
29 Copper-60 ²	W, sulfides, halides and nitrates	-	1E+5	5E-5	2E-7	-	-
	Y, oxides and hydroxides	-	1E+5	4E-5	1E-7	-	-
	D, see ⁶⁰ Cu	1E+4	3E+4	1E-5	4E-8	2E-4	2E-3
29 Copper-61	W, see ⁶⁰ Cu	-	4E+4	2E-5	6E-8	-	-
	Y, see ⁶⁰ Cu	-	4E+4	1E-5	5E-8	-	-
	D, see ⁶⁰ Cu	1E+4	3E+4	1E-5	4E-8	2E-4	2E-3
29 Copper-64	W, see ⁶⁰ Cu	-	2E+4	1E-5	3E-8	-	-
	Y, see ⁶⁰ Cu	-	2E+4	9E-6	3E-8	-	-
	D, see ⁶⁰ Cu	5E+3	8E+3	3E-6	1E-8	6E-5	6E-4
29 Copper-67	W, see ⁶⁰ Cu	-	5E+3	2E-6	7E-9	-	-
	Y, see ⁶⁰ Cu	-	5E+3	2E-6	6E-9	-	-
	Y, all compounds	1E+3	3E+3	1E-6	4E-9	2E-5	2E-4
30 Zinc-62	Y, all compounds	2E+4	7E+4	3E-5	9E-8	-	-
	St. wall (3E+4)	-	-	-	-	3E-4	3E-3
	Y, all compounds	4E+2	3E+2	1E-7	4E-10	5E-6	5E-5
30 Zinc-65	Y, all compounds	4E+2	3E+2	1E-7	4E-10	5E-6	5E-5
30 Zinc-69m	Y, all compounds	4E+3	7E+3	3E-6	1E-8	6E-5	6E-4

30 Zinc-69 ²	Y, all compounds	6E+4	1E+5	6E-5	2E-7	8E-4	8E-3
30 Zinc-71m	Y, all compounds	6E+3	2E+4	7E-6	2E-8	8E-5	8E-4
30 Zinc-72	Y, all compounds	1E+3	1E+3	5E-7	2E-9	1E-5	1E-4
31 Gallium-65 ²	D, all compounds except those given for W	5E+4 St. wall (6E+4)	2E+5 -	7E-5 -	2E-7 -	- 9E-4	- 9E-3
	W, oxides, hydroxides, carbides, halides, and nitrates	-	2E+5	8E-5	3E-7	-	-
31 Gallium-66	D, see ⁶⁵ Ga W, see ⁶⁵ Ga	1E+3 -	4E+3 3E+3	1E-6 1E-6	5E-9 4E-9	1E-5 -	1E-4 -
31 Gallium-67	D, see ⁶⁵ Ga W, see ⁶⁵ Ga	7E+3 -	1E+4 1E+4	6E-6 4E-6	2E-8 1E-8	1E-4 -	1E-3 -
31 Gallium-68 ²	D, see ⁶⁵ Ga W, see ⁶⁵ Ga	2E+4 -	4E+4 5E+4	2E-5 2E-5	6E-8 7E-8	2E-4 -	2E-3 -
31 Gallium-70 ²	D, see ⁶⁵ Ga	5E+4 St. wall (7E+4)	2E+5 -	7E-5 -	2E-7 -	- 1E-3	- 1E-2
	W, see ⁶⁵ Ga	-	2E+5	8E-5	3E-7	-	-
31 Gallium-72	D, see ⁶⁵ Ga W, see ⁶⁵ Ga	1E+3 -	4E+3 3E+3	1E-6 1E-6	5E-9 4E-9	2E-5 -	2E-4 -
31 Gallium-73	D, see ⁶⁵ Ga W, see ⁶⁵ Ga	5E+3 -	2E+4 2E+4	6E-6 6E-6	2E-8 2E-8	7E-5 -	7E-4 -
32 Germanium-66D,	all compounds except those given for W	2E+4	3E+4	1E-5	4E-8	3E-4	3E-3
	W, oxides, sulfides, and halides	-	2E+4	8E-6	3E-8	-	-
32 Germanium-67 ²	D, see ⁶⁶ Ge	3E+4 St. wall (4E+4)	9E+4 -	4E-5 -	1E-7 -	- 6E-4	- 6E-3

	W, see ⁶⁶ Ge	-	1E+5	4E-5	1E-7	-	-
32 Germanium-68	D, see ⁶⁶ Ge	5E+3	4E+3	2E-6	5E-9	6E-5	6E-4
	W, see ⁶⁶ Ge	-	1E+2	4E-8	1E-10	-	-
32 Germanium-69	D, see ⁶⁶ Ge	1E+4	2E+4	6E-6	2E-8	2E-4	2E-3
	W, see ⁶⁶ Ge	-	8E+3	3E-6	1E-8	-	-
32 Germanium-71	D, see ⁶⁶ Ge	5E+5	4E+5	2E-4	6E-7	7E-3	7E-2
	W, see ⁶⁶ Ge	-	4E+4	2E-5	6E-8	-	-
32 Germanium-75 ²	D, see ⁶⁶ Ge	4E+4	8E+4	3E-5	1E-7	-	-
	St. wall (7E+4)	-	-	-	-	9E-4	9E-3
	W, see ⁶⁶ Ge	-	8E+4	4E-5	1E-7	-	-
32 Germanium-77	D, see ⁶⁶ Ge	9E+3	1E+4	4E-6	1E-8	1E-4	1E-3
	W, see ⁶⁶ Ge	-	6E+3	2E-6	8E-9	-	-
32 Germanium-78 ²	D, see ⁶⁶ Ge	2E+4	2E+4	9E-6	3E-8	-	-
	St. wall (2E+4)	-	-	-	-	3E-4	3E-3
	W, see ⁶⁶ Ge	-	2E+4	9E-6	3E-8	-	-
33 Arsenic-69 ²	W, all compounds	3E+4	1E+5	5E-5	2E-7	-	-
	St. wall (4E+4)	-	-	-	-	6E-4	6E-3
33 Arsenic-70 ²	W, all compounds	1E+4	5E+4	2E-5	7E-8	2E-4	2E-3
33 Arsenic-71	W, all compounds	4E+3	5E+3	2E-6	6E-9	5E-5	5E-4
33 Arsenic-72	W, all compounds	9E+2	1E+3	6E-7	2E-9	1E-5	1E-4
33 Arsenic-73	W, all compounds	8E+3	2E+3	7E-7	2E-9	1E-4	1E-3
33 Arsenic-74	W, all compounds	1E+3	8E+2	3E-7	1E-9	2E-5	2E-4
33 Arsenic-76	W, all compounds	1E+3	1E+3	6E-7	2E-9	1E-5	1E-4
33 Arsenic-77	W, all compounds	4E+3	5E+3	2E-6	7E-9	-	-
	LLI wall (5E+3)	-	-	-	-	6E-5	6E-4
33 Arsenic-78 ²	W, all compounds	8E+3	2E+4	9E-6	3E-8	1E-4	1E-3
34 Selenium-70 ²	D, all compounds						

	except those given for W	2E+4	4E+4	2E-5	5E-8	1E-4	1E-3
	W, oxides, hydroxides, carbides, and elemental Se	1E+4	4E+4	2E-5	6E-8	-	-
34 Selenium-73m ²	D, see ⁷⁰ Se	6E+4	2E+5	6E-5	2E-7	4E-4	4E-3
	W, see ⁷⁰ Se	3E+4	1E+5	6E-5	2E-7	-	-
34 Selenium-73	D, see ⁷⁰ Se	3E+3	1E+4	5E-6	2E-8	4E-5	4E-4
	W, see ⁷⁰ Se	-	2E+4	7E-6	2E-8	-	-
34 Selenium-75	D, see ⁷⁰ Se	5E+2	7E+2	3E-7	1E-9	7E-6	7E-5
	W, see ⁷⁰ Se	-	6E+2	3E-7	8E-10	-	-
34 Selenium-79	D, see ⁷⁰ Se	6E+2	8E+2	3E-7	1E-9	8E-6	8E-5
	W, see ⁷⁰ Se	-	6E+2	2E-7	8E-10	-	-
34 Selenium-81m ²	D, see ⁷⁰ Se	4E+4	7E+4	3E-5	9E-8	3E-4	3E-3
	W, see ⁷⁰ Se	2E+4	7E+4	3E-5	1E-7	-	-
34 Selenium-81 ²	D, see ⁷⁰ Se	6E+4	2E+5	9E-5	3E-7	-	-
	St. wall (8E+4)	-	-	-	-	1E-3	1E-2
	W, see ⁷⁰ Se	-	2E+5	1E-4	3E-7	-	-
34 Selenium-83 ²	D, see ⁷⁰ Se	4E+4	1E+5	5E-5	2E-7	4E-4	4E-3
	W, see ⁷⁰ Se	3E+4	1E+5	5E-5	2E-7	-	-
35 Bromine-74m ²	D, bromides of H, Li, Na, K, Rb, Cs, and Fr	1E+4	4E+4	2E-5	5E-8	-	-
	St. wall (2E+4)	-	-	-	-	3E-4	3E-3
	W, bromides of lanthanides, Be, Mg, Ca, Sr, Ba, Ra, Al, Ga, In, Tl, Ge, Sn, Pb, As, Sb, Bi, Fe, Ru, Os, Co, Rh, Ir, Ni, Pd, Pt, Cu, Ag, Au, Zn, Cd, Hg, Sc, Y, Ti, Zr, Hf, V, Nb, Ta, Mn, Tc, and Re	-	4E+4	2E-5	6E-8	-	-
35 Bromine-74 ²	D, see ⁷⁴ mBr	2E+4	7E+4	3E-5	1E-7	-	-
	St. wall	-	-	-	-	-	-

		(4E+4)	-	-	-	5E-4	5E-3
	W, see ⁷⁴ mBr	-	8E+4	4E-5	1E-7	-	-
35 Bromine-75 ²	D, see ⁷⁴ mBr	3E+4	5E+4	2E-5	7E-8	-	-
		St. wall (4E+4)	-	-	-	5E-4	5E-3
	W, see ⁷⁴ mBr	-	5E+4	2E-5	7E-8	-	-
35 Bromine-76	D, see ⁷⁴ mBr	4E+3	5E+3	2E-6	7E-9	5E-5	5E-4
	W, see ⁷⁴ mBr	-	4E+3	2E-6	6E-9	-	-
35 Bromine-77	D, see ⁷⁴ mBr	2E+4	2E+4	1E-5	3E-8	2E-4	2E-3
	W, see ⁷⁴ mBr	-	2E+4	8E-6	3E-8	-	-
35 Bromine-80m	D, see ⁷⁴ mBr	2E+4	2E+4	7E-6	2E-8	3E-4	3E-3
	W, see ⁷⁴ mBr	-	1E+4	6E-6	2E-8	-	-
35 Bromine-80 ²	D, see ⁷⁴ mBr	5E+4	2E+5	8E-5	3E-7	-	-
		St. wall (9E+4)	-	-	-	1E-3	1E-2
	W, see ⁷⁴ mBr	-	2E+5	9E-5	3E-7	-	-
35 Bromine-82	D, see ⁷⁴ mBr	3E+3	4E+3	2E-6	6E-9	4E-5	4E-4
	W, see ⁷⁴ mBr	-	4E+3	2E-6	5E-9	-	-
35 Bromine-83	D, see ⁷⁴ mBr	5E+4	6E+4	3E-5	9E-8	-	-
		St. wall (7E+4)	-	-	-	9E-4	9E-3
	W, see ⁷⁴ mBr	-	6E+4	3E-5	9E-8	-	-
35 Bromine-84 ²	D, see ⁷⁴ mBr	2E+4	6E+4	2E-5	8E-8	-	-
		St. wall (3E+4)	-	-	-	4E-4	4E-3
	W, see ⁷⁴ mBr	-	6E+4	3E-5	9E-8	-	-
36 Krypton-74 ²	Submersion ¹	-	-	3E-6	1E-8	-	-
36 Krypton-76	Submersion ¹	-	-	9E-6	4E-8	-	-
36 Krypton-77 ²	Submersion ¹	-	-	4E-6	2E-8	-	-
36 Krypton-79	Submersion ¹	-	-	2E-5	7E-8	-	-
36 Krypton-81	Submersion ¹	-	-	7E-4	3E-6	-	-

36 Krypton-83m ²	Submersion ¹	-	-	1E-2	5E-5	-	-
36 Krypton-85m	Submersion ¹	-	-	2E-5	1E-7	-	-
36 Krypton-85	Submersion ¹	-	-	1E-4	7E-7	-	-
36 Krypton-87 ²	Submersion ¹	-	-	5E-6	2E-8	-	-
36 Krypton-88	Submersion ¹	-	-	2E-6	9E-9	-	-
37 Rubidium-79 ²	D, all compounds	4E+4 St. wall (6E+4)	1E+5 -	5E-5 -	2E-7 -	- 8E-4	- 8E-3
37 Rubidium-81m ²	D, all compounds	2E+5 St. wall (3E+5)	3E+5 -	1E-4 -	5E-7 -	- 4E-3	- 4E-2
37 Rubidium-81	D, all compounds	4E+4	5E+4	2E-5	7E-8	5E-4	5E-3
37 Rubidium-82m	D, all compounds	1E+4	2E+4	7E-6	2E-8	2E-4	2E-3
37 Rubidium-83	D, all compounds	6E+2	1E+3	4E-7	1E-9	9E-6	9E-5
37 Rubidium-84	D, all compounds	5E+2	8E+2	3E-7	1E-9	7E-6	7E-5
37 Rubidium-86	D, all compounds	5E+2	8E+2	3E-7	1E-9	7E-6	7E-5
37 Rubidium-87	D, all compounds	1E+3	2E+3	6E-7	2E-9	1E-5	1E-4
37 Rubidium-88 ²	D, all compounds	2E+4 St. wall (3E+4)	6E+4 -	3E-5 -	9E-8 -	- 4E-4	- 4E-3
37 Rubidium-89 ²	D, all compounds	4E+4 St. wall (6E+4)	1E+5 -	6E-5 -	2E-7 -	- 9E-4	- 9E-3
38 Strontium-80 ²	D, all soluble compounds except SrTiO ₃	4E+3	1E+4	5E-6	2E-8	6E-5	6E-4
	Y, all insoluble compounds and SrTiO ₃	-	1E+4	5E-6	2E-8	-	-
38 Strontium-81 ²	D, see ⁸⁰ Sr	3E+4	8E+4	3E-5	1E-7	3E-4	3E-3
	Y, see ⁸⁰ Sr	2E+4	8E+4	3E-5	1E-7	-	-

38 Strontium-82	D, see ^{80}Sr	3E+2 LLI wall (2E+2)	4E+2	2E-7	6E-10	-	-
	Y, see ^{80}Sr		-	-	-	3E-6	3E-5
38 Strontium-83	D, see ^{80}Sr	3E+3	7E+3	3E-6	1E-8	3E-5	3E-4
	Y, see ^{80}Sr	2E+3	4E+3	1E-6	5E-9	-	-
38 Strontium-85m ²	D, see ^{80}Sr	2E+5	6E+5	3E-4	9E-7	3E-3	3E-2
	Y, see ^{80}Sr	-	8E+5	4E-4	1E-6	-	-
38 Strontium-85	D, see ^{80}Sr	3E+3	3E+3	1E-6	4E-9	4E-5	4E-4
	Y, see ^{80}Sr	-	2E+3	6E-7	2E-9	-	-
38 Strontium-87m	D, see ^{80}Sr	5E+4	1E+5	5E-5	2E-7	6E-4	6E-3
	Y, see ^{80}Sr	4E+4	2E+5	6E-5	2E-7	-	-
38 Strontium-89	D, see ^{80}Sr	6E+2 LLI wall (6E+2)	8E+2	4E-7	1E-9	-	-
	Y, see ^{80}Sr		-	-	-	8E-6	8E-5
38 Strontium-90	D, see ^{80}Sr	3E+1 Bone surf (4E+1)	2E+1 Bone surf (2E+1)	8E-9	-	-	-
	Y, see ^{80}Sr	-	4E+0	2E-9	6E-12	-	-
38 Strontium-91	D, see ^{80}Sr	2E+3	6E+3	2E-6	8E-9	2E-5	2E-4
	Y, see ^{80}Sr	-	4E+3	1E-6	5E-9	-	-
38 Strontium-92	D, see ^{80}Sr	3E+3	9E+3	4E-6	1E-8	4E-5	4E-4
	Y, see ^{80}Sr	-	7E+3	3E-6	9E-9	-	-
39 Yttrium-86m ²	W, all compounds except those given for Y	2E+4	6E+4	2E-5	8E-8	3E-4	3E-3
	Y, oxides and hydroxides	-	5E+4	2E-5	8E-8	-	-
39 Yttrium-86	W, see ^{86m}Y	1E+3	3E+3	1E-6	5E-9	2E-5	2E-4
	Y, see ^{86m}Y	-	3E+3	1E-6	5E-9	-	-
39 Yttrium-87	W, see ^{86m}Y	2E+3	3E+3	1E-6	5E-9	3E-5	3E-4
	Y, see ^{86m}Y	-	3E+3	1E-6	5E-9	-	-

39 Yttrium-88	W, see ^{86m} Y	1E+3	3E+2	1E-7	3E-10	1E-5	1E-4
	Y, see ^{86m} Y	-	2E+2	1E-7	3E-10	-	-
39 Yttrium-90m	W, see ^{86m} Y	8E+3	1E+4	5E-6	2E-8	1E-4	1E-3
	Y, see ^{86m} Y	-	1E+4	5E-6	2E-8	-	-
39 Yttrium-90	W, see ^{86m} Y	4E+2	7E+2	3E-7	9E-10	-	-
		LLI wall (5E+2)	-	-	-	7E-6	7E-5
	Y, see ^{86m} Y	-	6E+2	3E-7	9E-10	-	-
39 Yttrium-91m ²	W, see ^{86m} Y	1E+5	2E+5	1E-4	3E-7	2E-3	2E-2
	Y, see ^{86m} Y	-	2E+5	7E-5	2E-7	-	-
39 Yttrium-91	W, see ^{86m} Y	5E+2	2E+2	7E-8	2E-10	-	-
		LLI wall (6E+2)	-	-	-	8E-6	8E-5
	Y, see ^{86m} Y	-	1E+2	5E-8	2E-10	-	-
39 Yttrium-92	W, see ^{86m} Y	3E+3	9E+3	4E-6	1E-8	4E-5	4E-4
	Y, see ^{86m} Y	-	8E+3	3E-6	1E-8	-	-
39 Yttrium-93	W, see ^{86m} Y	1E+3	3E+3	1E-6	4E-9	2E-5	2E-4
	Y, see ^{86m} Y	-	2E+3	1E-6	3E-9	-	-
39 Yttrium-94 ²	W, see ^{86m} Y	2E+4	8E+4	3E-5	1E-7	-	-
		St. wall (3E+4)	-	-	-	4E-4	4E-3
	Y, see ^{86m} Y	-	8E+4	3E-5	1E-7	-	-
39 Yttrium-95 ²	W, see ^{86m} Y	4E+4	2E+5	6E-5	2E-7	-	-
		St. wall (5E+4)	-	-	-	7E-4	7E-3
	Y, see ^{86m} Y	-	1E+5	6E-5	2E-7	-	-
40 Zirconium-86	D, all compounds except those given for W and Y	1E+3	4E+3	2E-6	6E-9	2E-5	2E-4
	W, oxides, hydroxides, halides, and nitrates	-	3E+3	1E-6	4E-9	-	-
	Y, carbide	-	2E+3	1E-6	3E-9	-	-

40 Zirconium-88	D, see ⁸⁶ Zr	4E+3	2E+2	9E-8	3E-10	5E-5	5E-4
	W, see ⁸⁶ Zr	-	5E+2	2E-7	7E-10	-	-
	Y, see ⁸⁶ Zr	-	3E+2	1E-7	4E-10	-	-
40 Zirconium-89	D, see ⁸⁶ Zr	2E+3	4E+3	1E-6	5E-9	2E-5	2E-4
	W, see ⁸⁶ Zr	-	2E+3	1E-6	3E-9	-	-
	Y, see ⁸⁶ Zr	-	2E+3	1E-6	3E-9	-	-
40 Zirconium-93	D, see ⁸⁶ Zr	1E+3	6E+0	3E-9	-	-	-
	Bone surf (3E+3)	Bone surf (2E+1)	-	2E-11	4E-5	4E-4	
	W, see ⁸⁶ Zr	-	2E+1	1E-8	-	-	-
		-	Bone surf (6E+1)	-	9E-11	-	-
	Y, see ⁸⁶ Zr	-	6E+1	2E-8	-	-	-
		-	Bone surf (7E+1)	-	9E-11	-	-
40 Zirconium-95	D, see ⁸⁶ Zr	1E+3	1E+2	5E-8	-	2E-5	2E-4
	Bone surf (3E+2)	-	4E-10	-	-	-	
	W, see ⁸⁶ Zr	-	4E+2	2E-7	5E-10	-	-
	Y, see ⁸⁶ Zr	-	3E+2	1E-7	4E-10	-	-
40 Zirconium-97	D, see ⁸⁶ Zr	6E+2	2E+3	8E-7	3E-9	9E-6	9E-5
	W, see ⁸⁶ Zr	-	1E+3	6E-7	2E-9	-	-
	Y, see ⁸⁶ Zr	-	1E+3	5E-7	2E-9	-	-
41 Niobium-88 ²	W, all compounds except those given for Y	5E+4	2E+5	9E-5	3E-7	-	-
	St. wall (7E+4)	-	-	-	1E-3	1E-2	
	Y, oxides and hydroxides	-	2E+5	9E-5	3E-7	-	-
41 Niobium-89m ² (66 min)	W, see ⁸⁸ Nb	1E+4	4E+4	2E-5	6E-8	1E-4	1E-3
	Y, see ⁸⁸ Nb	-	4E+4	2E-5	5E-8	-	-
41 Niobium-89	W, see ⁸⁸ Nb	5E+3	2E+4	8E-6	3E-8	7E-5	7E-4

(122 min)	Y, see ⁸⁸ Nb	-	2E+4	6E-6	2E-8	-	-
41 Niobium-90	W, see ⁸⁸ Nb	1E+3	3E+3	1E-6	4E-9	1E-5	1E-4
	Y, see ⁸⁸ Nb	-	2E+3	1E-6	3E-9	-	-
41 Niobium-93m	W, see ⁸⁸ Nb	9E+3	2E+3	8E-7	3E-9	-	-
	LLI wall (1E+4)	-	-	-	-	2E-4	2E-3
	Y, see ⁸⁸ Nb	-	2E+2	7E-8	2E-10	-	-
41 Niobium-94	W, see ⁸⁸ Nb	9E+2	2E+2	8E-8	3E-10	1E-5	1E-4
	Y, see ⁸⁸ Nb	-	2E+1	6E-9	2E-11	-	-
41 Niobium-95m	W, see ⁸⁸ Nb	2E+3	3E+3	1E-6	4E-9	-	-
	LLI wall (2E+3)	-	-	-	-	3E-5	3E-4
	Y, see ⁸⁸ Nb	-	2E+3	9E-7	3E-9	-	-
41 Niobium-95	W, see ⁸⁸ Nb	2E+3	1E+3	5E-7	2E-9	3E-5	3E-4
	Y, see ⁸⁸ Nb	-	1E+3	5E-7	2E-9	-	-
41 Niobium-96	W, see ⁸⁸ Nb	1E+3	3E+3	1E-6	4E-9	2E-5	2E-4
	Y, see ⁸⁸ Nb	-	2E+3	1E-6	3E-9	-	-
41 Niobium-97 ²	W, see ⁸⁸ Nb	2E+4	8E+4	3E-5	1E-7	3E-4	3E-3
	Y, see ⁸⁸ Nb	-	7E+4	3E-5	1E-7	-	-
41 Niobium-98 ²	W, see ⁸⁸ Nb	1E+4	5E+4	2E-5	8E-8	2E-4	2E-3
	Y, see ⁸⁸ Nb	-	5E+4	2E-5	7E-8	-	-
42 Molybdenum-90 D all compounds except those given for Y		4E+3	7E+3	3E-6	1E-8	3E-5	3E-4
	Y, oxides, hydroxides, and MoS ₂	2E+3	5E+3	2E-6	6E-9	-	-
42 Molybdenum-93m D, see ⁹⁰ Mo	Y, see ⁹⁰ Mo	9E+3	2E+4	7E-6	2E-8	6E-5	6E-4
		4E+3	1E+4	6E-6	2E-8	-	-
42 Molybdenum-93 D, see ⁹⁰ Mo	Y, see ⁹⁰ Mo	4E+3	5E+3	2E-6	8E-9	5E-5	5E-4
		2E+4	2E+2	8E-8	2E-10	-	-
42 Molybdenum-99 D, see ⁹⁰ Mo		2E+3	3E+3	1E-6	4E-9	-	-
	LLI						

		wall (1E+3)	-	-	-	2E-5	2E-4
	Y, see ⁹⁰ Mo	1E+3	1E+3	6E-7	2E-9	-	-
42 Molybdenum-101 ²	D, see ⁹⁰ Mo	4E+4	1E+5	6E-5	2E-7	-	-
		St. wall (5E+4)	-	-	-	7E-4	7E-3
	Y, see ⁹⁰ Mo	-	1E+5	6E-5	2E-7	-	-
43 Technetium-93m ²	D, all compounds except those given for W	7E+4	2E+5	6E-5	2E-7	1E-3	1E-2
	W, oxides, hydroxides, halides, and nitrates	-	3E+5	1E-4	4E-7	-	-
43 Technetium-93	D, see ^{93m} Tc	3E+4	7E+4	3E-5	1E-7	4E-4	4E-3
	W, see ^{93m} Tc	-	1E+5	4E-5	1E-7	-	-
43 Technetium-94m ²	D, see ^{93m} Tc	2E+4	4E+4	2E-5	6E-8	3E-4	3E-3
	W, see ^{93m} Tc	-	6E+4	2E-5	8E-8	-	-
43 Technetium-94	D, see ^{93m} Tc	9E+3	2E+4	8E-6	3E-8	1E-4	1E-3
	W, see ^{93m} Tc	-	2E+4	1E-5	3E-8	-	-
43 Technetium-95m	D, see ^{93m} Tc	4E+3	5E+3	2E-6	8E-9	5E-5	5E-4
	W, see ^{93m} Tc	-	2E+3	8E-7	3E-9	-	-
43 Technetium-95	D, see ^{93m} Tc	1E+4	2E+4	9E-6	3E-8	1E-4	1E-3
	W, see ^{93m} Tc	-	2E+4	8E-6	3E-8	-	-
43 Technetium-96m ²	D, see ^{93m} Tc	2E+5	3E+5	1E-4	4E-7	2E-3	2E-2
	W, see ^{93m} Tc	-	2E+5	1E-4	3E-7	-	-
43 Technetium-96	D, see ^{93m} Tc	2E+3	3E+3	1E-6	5E-9	3E-5	3E-4
	W, see ^{93m} Tc	-	2E+3	9E-7	3E-9	-	-
43 Technetium-97m	D, see ^{93m} Tc	5E+3	7E+3	3E-6	-	6E-5	6E-4
		-	St. wall (7E+3)	-	1E-8	-	-
	W, see ^{93m} Tc	-	1E+3	5E-7	2E-9	-	-
43 Technetium-97	D, see ^{93m} Tc	4E+4	5E+4	2E-5	7E-8	5E-4	5E-3
	W, see ^{93m} Tc	-	6E+3	2E-6	8E-9	-	-
43 Technetium-98	D, see ^{93m} Tc	1E+3	2E+3	7E-7	2E-9	1E-5	1E-4
	W, see ^{93m} Tc	-	3E+2	1E-7	4E-10	-	-

43 Technetium-99mD, see ^{93m}Tc	8E+4	2E+5	6E-5	2E-7	1E-3	1E-2
W, see ^{93m}Tc	-	2E+5	1E-4	3E-7	-	-
43 Technetium-99 D, see ^{93m}Tc	4E+3	5E+3	2E-6	-	6 E-5	6E-4
	-	St. wall (6E+3)	-	8E-9	-	-
W, see ^{93m}Tc	-	7E+2	3E-7	9E-10	-	-
43 Technetium-101 ² D, see ^{93m}Tc	9E+4	3E+5	1E-4	5E-7	-	-
	St. wall (1E+5)	-	-	-	2E-3	2E-2
W, see ^{93m}Tc	-	4E+5	2E-4	5E-7	-	-
43 Technetium-104 ² D, see ^{93m}Tc	2E+4	7E+4	3E-5	1E-7	-	-
	St. wall (3E+4)	-	-	-	4E-4	4E-3
W, see ^{93m}Tc	-	9E+4	4E-5	1E-7	-	-
44 Ruthenium-94 ² D, all compounds except those given for W and Y	2E+4	4E+4	2E-5	6E-8	2E-4	2E-3
W, halides	-	6E+4	3E-5	9E-8	-	-
Y, oxides and hydroxides	-	6E+4	2E-5	8E-8	-	-
44 Ruthenium-97 D, see ^{94}Ru	8E+3	2E+4	8E-6	3E-8	1E-4	1E-3
W, see ^{94}Ru	-	1E+4	5E-6	2E-8	-	-
Y, see ^{94}Ru	-	1E+4	5E-6	2E-8	-	-
44 Ruthenium-103 D, see ^{94}Ru	2E+3	2E+3	7E-7	2E-9	3E-5	3E-4
W, see ^{94}Ru	-	1E+3	4E-7	1E-9	-	-
Y, see ^{94}Ru	-	6E+2	3E-7	9E-10	-	-
44 Ruthenium-105 D, see ^{94}Ru	5E+3	1E+4	6E-6	2E-8	7E-5	7E-4
W, see ^{94}Ru	-	1E+4	6E-6	2E-8	-	-
Y, see ^{94}Ru	-	1E+4	5E-6	2E-8	-	-
44 Ruthenium-106 D, see ^{94}Ru	2E+2	9E+1	4E-8	1E-10	-	-
	LLI wall (2E+2)	-	-	-	3E-6	3E-5
W, see ^{94}Ru	-	5E+1	2E-8	8E-11	-	-
Y, see ^{94}Ru	-	1E+1	5E-9	2E-11	-	-

45 Rhodium-99m	D, all compounds except those given for W and Y	2E+4	6E+4	2E-5	8E-8	2E-4	2E-3
	W, halides	-	8E+4	3E-5	1E-7	-	-
	Y, oxides and hydroxides	-	7E+4	3E-5	9E-8	-	-
45 Rhodium-99	D, see ^{99m} Rh	2E+3	3E+3	1E-6	4E-9	3E-5	3E-4
	W, see ^{99m} Rh	-	2E+3	9E-7	3E-9	-	-
	Y, see ^{99m} Rh	-	2E+3	8E-7	3E-9	-	-
45 Rhodium-100	D, see ^{99m} Rh	2E+3	5E+3	2E-6	7E-9	2E-5	2E-4
	W, see ^{99m} Rh	-	4E+3	2E-6	6E-9	-	-
	Y, see ^{99m} Rh	-	4E+3	2E-6	5E-9	-	-
45 Rhodium-101m	D, see ^{99m} Rh	6E+3	1E+4	5E-6	2E-8	8E-5	8E-4
	W, see ^{99m} Rh	-	8E+3	4E-6	1E-8	-	-
	Y, see ^{99m} Rh	-	8E+3	3E-6	1E-8	-	-
45 Rhodium-101	D, see ^{99m} Rh	2E+3	5E+2	2E-7	7E-10	3E-5	3E-4
	W, see ^{99m} Rh	-	8E+2	3E-7	1E-9	-	-
	Y, see ^{99m} Rh	-	2E+2	6E-8	2E-10	-	-
45 Rhodium-102m	D, see ^{99m} Rh	1E+3	5E+2	2E-7	7E-10	-	-
	LLI wall (1E+3)	-	-	-	-	2E-5	2E-4
	W, see ^{99m} Rh	-	4E+2	2E-7	5E-10	-	-
	Y, see ^{99m} Rh	-	1E+2	5E-8	2E-10	-	-
45 Rhodium-102	D, see ^{99m} Rh	6E+2	9E+1	4E-8	1E-10	8E-6	8E-5
	W, see ^{99m} Rh	-	2E+2	7E-8	2E-10	-	-
	Y, see ^{99m} Rh	-	6E+1	2E-8	8E-11	-	-
45 Rhodium-103m ²	D, see ^{99m} Rh	4E+5	1E+6	5E-4	2E-6	6E-3	6E-2
	W, see ^{99m} Rh	-	1E+6	5E-4	2E-6	-	-
	Y, see ^{99m} Rh	-	1E+6	5E-4	2E-6	-	-
45 Rhodium-105	D, see ^{99m} Rh	4E+3	1E+4	5E-6	2E-8	-	-
	LLI wall (4E+3)	-	-	-	-	5E-5	5E-4
	W, see ^{99m} Rh	-	6E+3	3E-6	9E-9	-	-
	Y, see ^{99m} Rh	-	6E+3	2E-6	8E-9	-	-

45 Rhodium-106m	D, see ^{99m} Rh	8E+3	3E+4	1E-5	4E-8	1E-4	1E-3
	W, see ^{99m} Rh	-	4E+4	2E-5	5E-8	-	-
	Y, see ^{99m} Rh	-	4E+4	1E-5	5E-8	-	-
45 Rhodium-107 ²	D, see ^{99m} Rh	7E+4	2E+5	1E-4	3E-7	-	-
	St. wall (9E+4)	-	-	-	-	1E-3	1E-2
	W, see ^{99m} Rh	-	3E+5	1E-4	4E-7	-	-
	Y, see ^{99m} Rh	-	3E+5	1E-4	3E-7	-	-
46 Palladium-100	D, all compounds except those given for W and Y	1E+3	1E+3	6E-7	2E-9	2E-5	2E-4
	W, nitrates	-	1E+3	5E-7	2E-9	-	-
	Y, oxides and hydroxides	-	1E+3	6E-7	2E-9	-	-
46 Palladium-101	D, see ¹⁰⁰ Pd	1E+4	3E+4	1E-5	5E-8	2E-4	2E-3
	W, see ¹⁰⁰ Pd	-	3E+4	1E-5	5E-8	-	-
	Y, see ¹⁰⁰ Pd	-	3E+4	1E-5	4E-8	-	-
46 Palladium-103	D, see ¹⁰⁰ Pd	6E+3	6E+3	3E-6	9E-9	-	-
	LLI wall (7E+3)	-	-	-	-	1E-4	1E-3
	W, see ¹⁰⁰ Pd	-	4E+3	2E-6	6E-9	-	-
	Y, see ¹⁰⁰ Pd	-	4E+3	1E-6	5E-9	-	-
46 Palladium-107	D, see ¹⁰⁰ Pd	3E+4	2E+4	9E-6	-	-	-
	LLI wall (4E+4)	-	Kidneys (2E+4)	-	3E-8	5E-4	5E-3
	W, see ¹⁰⁰ Pd	-	7E+3	3E-6	1E-8	-	-
	Y, see ¹⁰⁰ Pd	-	4E+2	2E-7	6E-10	-	-
46 Palladium-109	D, see ¹⁰⁰ Pd	2E+3	6E+3	3E-6	9E-9	3E-5	3E-4
	W, see ¹⁰⁰ Pd	-	5E+3	2E-6	8E-9	-	-
	Y, see ¹⁰⁰ Pd	-	5E+3	2E-6	6E-9	-	-
47 Silver-102 ²	D, all compounds except those given for W and Y	5E+4	2E+5	8E-5	2E-7	-	-
	St. wall (6E+4)	-	-	-	-	9E-4	9E-3

	W, nitrates and sulfides	-	2E+5	9E-5	3E-7	-	-
	Y, oxides and hydroxides	-	2E+5	8E-5	3E-7	-	-
47 Silver-103 ²	D, see ¹⁰² Ag	4E+4	1E+5	4E-5	1E-7	5E-4	5E-3
	W, see ¹⁰² Ag	-	1E+5	5E-5	2E-7	-	-
	Y, see ¹⁰² Ag	-	1E+5	5E-5	2E-7	-	-
47 Silver-104m ²	D, see ¹⁰² Ag	3E+4	9E+4	4E-5	1E-7	4E-4	4E-3
	W, see ¹⁰² Ag	-	1E+5	5E-5	2E-7	-	-
	Y, see ¹⁰² Ag	-	1E+5	5E-5	2E-7	-	-
47 Silver-104 ²	D, see ¹⁰² Ag	2E+4	7E+4	3E-5	1E-7	3E-4	3E-3
	W, see ¹⁰² Ag	-	1E+5	6E-5	2E-7	-	-
	Y, see ¹⁰² Ag	-	1E+5	6E-5	2E-7	-	-
47 Silver-105	D, see ¹⁰² Ag	3E+3	1E+3	4E-7	1E-9	4E-5	4E-4
	W, see ¹⁰² Ag	-	2E+3	7E-7	2E-9	-	-
	Y, see ¹⁰² Ag	-	2E+3	7E-7	2E-9	-	-
47 Silver-106m	D, see ¹⁰² Ag	8E+2	7E+2	3E-7	1E-9	1E-5	1E-4
	W, see ¹⁰² Ag	-	9E+2	4E-7	1E-9	-	-
	Y, see ¹⁰² Ag	-	9E+2	4E-7	1E-9	-	-
47 Silver-106 ²	D, see ¹⁰² Ag	6E+4	2E+5	8E-5	3E-7	-	-
	St. wall (6E+4)	-	-	-	-	9E-4	9E-3
	W, see ¹⁰² Ag	-	2E+5	9E-5	3E-7	-	-
	Y, see ¹⁰² Ag	-	2E+5	8E-5	3E-7	-	-
47 Silver-108m	D, see ¹⁰² Ag	6E+2	2E+2	8E-8	3E-10	9E-6	9E-5
	W, see ¹⁰² Ag	-	3E+2	1E-7	4E-10	-	-
	Y, see ¹⁰² Ag	-	2E+1	1E-8	3E-11	-	-
47 Silver-110m	D, see ¹⁰² Ag	5E+2	1E+2	5E-8	2E-10	6E-6	6E-5
	W, see ¹⁰² Ag	-	2E+2	8E-8	3E-10	-	-
	Y, see ¹⁰² Ag	-	9E+1	4E-8	1E-10	-	-
47 Silver-111	D, see ¹⁰² Ag	9E+2	2E+3	6E-7	-	-	-
	LLI wall (1E+3)	-	Liver (2E+3)	-	2E-9	2E-5	2E-4
	W, see ¹⁰² Ag	-	9E+2	4E-7	1E-9	-	-
	Y, see ¹⁰² Ag	-	9E+2	4E-7	1E-9	-	-

47 Silver-112	D, see ^{102}Ag	3E+3	8E+3	3E-6	1E-8	4E-5	4E-4
	W, see ^{102}Ag	-	1E+4	4E-6	1E-8	-	-
	Y, see ^{102}Ag	-	9E+3	4E-6	1E-8	-	-
47 Silver-115 ²	D, see ^{102}Ag	3E+4	9E+4	4E-5	1E-7	-	-
	St. wall (3E+4)	-	-	-	-	4E-4	4E-3
	W, see ^{102}Ag	-	9E+4	4E-5	1E-7	-	-
	Y, see ^{102}Ag	-	8E+4	3E-5	1E-7	-	-
48 Cadmium-104 ²	D, all compounds except those given for W and Y	2E+4	7E+4	3E-5	9E-8	3E-4	3E-3
	W, sulfides, halides, and nitrates	-	1E+5	5E-5	2E-7	-	-
	Y, oxides and hydroxides	-	1E+5	5E-5	2E-7	-	-
48 Cadmium-107	D, see ^{104}Cd	2E+4	5E+4	2E-5	8E-8	3E-4	3E-3
	W, see ^{104}Cd	-	6E+4	2E-5	8E-8	-	-
	Y, see ^{104}Cd	-	5E+4	2E-5	7E-8	-	-
48 Cadmium-109	D, see ^{104}Cd	3E+2	4E+1	1E-8	-	-	-
	Kidneys (4E+2)	-	Kidneys (5E+1)	-	7E-11	6E-6	6E-5
	W, see ^{104}Cd	-	1E+2	5E-8	-	-	-
	Kidneys	-	(1E+2)	-	2E-10	-	-
	Y, see ^{104}Cd	-	1E+2	5E-8	2E-10	-	-
48 Cadmium-113m	D, see ^{104}Cd	2E+1	2E+0	1E-9	-	-	-
	Kidneys (4E+1)	-	Kidneys (4E+0)	-	5E-12	5E-7	5E-6
	W, see ^{104}Cd	-	8E+0	4E-9	-	-	-
	Kidneys	-	(1E+1)	-	2E-11	-	-
	Y, see ^{104}Cd	-	1E+1	5E-9	2E-11	-	-
48 Cadmium-113	D, see ^{104}Cd	2E+1	2E+0	9E-10	-	-	-
	Kidneys (3E+1)	-	Kidneys (3E+0)	-	5E-12	4E-7	4E-6

	W, see ^{104}Cd	-	8E+0	3E-9	-	-	-
		-	Kidneys (1E+1)	-	2E-11	-	-
	Y, see ^{104}Cd	-	1E+1	6E-9	2E-11	-	-
48 Cadmium-115m	D, see ^{104}Cd	3E+2	5E+1	2E-8	-	4E-6	4E-5
		-	Kidneys (8E+1)	-	1E-10	-	-
	W, see ^{104}Cd	-	1E+2	5E-8	2E-10	-	-
	Y, see ^{104}Cd	-	1E+2	6E-8	2E-10	-	-
48 Cadmium-115	D, see ^{104}Cd	9E+2	1E+3	6E-7	2E-9	-	-
		-	LLI wall (1E+3)	-	-	1E-5	1E-4
	W, see ^{104}Cd	-	1E+3	5E-7	2E-9	-	-
	Y, see ^{104}Cd	-	1E+3	6E-7	2E-9	-	-
48 Cadmium-117m	D, see ^{104}Cd	5E+3	1E+4	5E-6	2E-8	6E-5	6E-4
	W, see ^{104}Cd	-	2E+4	7E-6	2E-8	-	-
	Y, see ^{104}Cd	-	1E+4	6E-6	2E-8	-	-
48 Cadmium-117	D, see ^{104}Cd	5E+3	1E+4	5E-6	2E-8	6E-5	6E-4
	W, see ^{104}Cd	-	2E+4	7E-6	2E-8	-	-
	Y, see ^{104}Cd	-	1E+4	6E-6	2E-8	-	-
49 Indium-109	D, all compounds except those given for W	2E+4	4E+4	2E-5	6E-8	3E-4	3E-3
	W, oxides, hydroxides, halides, and nitrates	-	6E+4	3E-5	9E-8	-	-
49 Indium-110 ² (69.1 min)	D, see ^{109}In	2E+4	4E+4	2E-5	6E-8	2E-4	2E-3
	W, see ^{109}In	-	6E+4	2E-5	8E-8	-	-
49 Indium-110 (4.9 h)	D, see ^{109}In	5E+3	2E+4	7E-6	2E-8	7E-5	7E-4
	W, see ^{109}In	-	2E+4	8E-6	3E-8	-	-
49 Indium-111	D, see ^{109}In	4E+3	6E+3	3E-6	9E-9	6E-5	6E-4
	W, see ^{109}In	-	6E+3	3E-6	9E-9	-	-
49 Indium-112 ²	D, see ^{109}In	2E+5	6E+5	3E-4	9E-7	2E-3	2E-2
	W, see ^{109}In	-	7E+5	3E-4	1E-6	-	-
49 Indium-113m ²	D, see ^{109}In	5E+4	1E+5	6E-5	2E-7	7E-4	7E-3

	W, see ^{109}In	-	2E+5	8E-5	3E-7	-	-
49 Indium-114m	D, see ^{109}In	3E+2	6E+1	3E-8	9E-11	-	-
	LLI wall (4E+2)	-	-	-	-	5E-6	5E-5
	W, see ^{109}In	-	1E+2	4E-8	1E-10	-	-
49 Indium-115m	D, see ^{109}In	1E+4	4E+4	2E-5	6E-8	2E-4	2E-3
	W, see ^{109}In	-	5E+4	2E-5	7E-8	-	-
49 Indium-115	D, see ^{109}In	4E+1	1E+0	6E-10	2E-12	5E-7	5E-6
	W, see ^{109}In	-	5E+0	2E-9	8E-12	-	-
49 Indium-116m ²	D, see ^{109}In	2E+4	8E+4	3E-5	1E-7	3E-4	3E-3
	W, see ^{109}In	-	1E+5	5E-5	2E-7	-	-
49 Indium-117m ²	D, see ^{109}In	1E+4	3E+4	1E-5	5E-8	2E-4	2E-3
	W, see ^{109}In	-	4E+4	2E-5	6E-8	-	-
49 Indium-117 ²	D, see ^{109}In	6E+4	2E+5	7E-5	2E-7	8E-4	8E-3
	W, see ^{109}In	-	2E+5	9E-5	3E-7	-	-
49 Indium-119m ²	D, see ^{109}In	4E+4	1E+5	5E-5	2E-7	-	-
	St. wall (5E+4)	-	-	-	-	7E-4	7E-3
	W, see ^{109}In	-	1E+5	6E-5	2E-7	-	-
50 Tin-110	D, all compounds except those given for W	4E+3	1E+4	5E-6	2E-8	5E-5	5E-4
	W, sulfides, oxides, hydroxides, halides, nitrates, and stannic phosphate	-	1E+4	5E-6	2E-8	-	-
50 Tin-111 ²	D, see ^{110}Sn	7E+4	2E+5	9E-5	3E-7	1E-3	1E-2
	W, see ^{110}Sn	-	3E+5	1E-4	4E-7	-	-
50 Tin-113	D, see ^{110}Sn	2E+3	1E+3	5E-7	2E-9	-	-
	LLI wall (2E+3)	-	-	-	-	3E-5	3E-4
	W, see ^{110}Sn	-	5E+2	2E-7	8E-10	-	-
50 Tin-117m	D, see ^{110}Sn	2E+3	1E+3	5E-7	-	-	-
	LLI wall (2E+3)	-	Bone surf (2E+3)	-	3E-9	3E-5	3E-4

	W, see ^{110}Sn	-	1E+3	6E-7	2E-9	-	-
50 Tin-119m	D, see ^{110}Sn	3E+3	2E+3	1E-6	3E-9	-	-
	LLI wall (4E+3)	-	-	-	-	6E-5	6E-4
	W, see ^{110}Sn	-	1E+3	4E-7	1E-9	-	-
50 Tin-121m	D, see ^{110}Sn	3E+3	9E+2	4E-7	1E-9	-	-
	LLI wall (4E+3)	-	-	-	-	5E-5	5E-4
	W, see ^{110}Sn	-	5E+2	2E-7	8E-10	-	-
50 Tin-121	D, see ^{110}Sn	6E+3	2E+4	6E-6	2E-8	-	-
	LLI wall (6E+3)	-	-	-	-	8E-5	8E-4
	W, see ^{110}Sn	-	1E+4	5E-6	2E-8	-	-
50 Tin-123m ²	D, see ^{110}Sn	5E+4	1E+5	5E-5	2E-7	7E-4	7E-3
	W, see ^{110}Sn	-	1E+5	6E-5	2E-7	-	-
50 Tin-123	D, see ^{110}Sn	5E+2	6E+2	3E-7	9E-10	-	-
	LLI wall (6E+2)	-	-	-	-	9E-6	9E-5
	W, see ^{110}Sn	-	2E+2	7E-8	2E-10	-	-
50 Tin-125	D, see ^{110}Sn	4E+2	9E+2	4E-7	1E-9	-	-
	LLI wall (5E+2)	-	-	-	-	6E-6	6E-5
	W, see ^{110}Sn	-	4E+2	1E-7	5E-10	-	-
50 Tin-126	D, see ^{110}Sn	3E+2	6E+1	2E-8	8E-11	4E-6	4E-5
	W, see ^{110}Sn	-	7E+1	3E-8	9E-11	-	-
50 Tin-127	D, see ^{110}Sn	7E+3	2E+4	8E-6	3E-8	9E-5	9E-4
	W, see ^{110}Sn	-	2E+4	8E-6	3E-8	-	-
50 Tin-128 ²	D, see ^{110}Sn	9E+3	3E+4	1E-5	4E-8	1E-4	1E-3
	W, see ^{110}Sn	-	4E+4	1E-5	5E-8	-	-
51 Antimony-115 ²	D, all compounds except those given for W	8E+4	2E+5	1E-4	3E-7	1E-3	1E-2
	W, oxides, hydroxides,						

		halides, sulfides, sulfates, and nitrates					
		-	3E+5	1E-4	4E-7	-	-
51 Antimony-116m ²	D, see ¹¹⁵ Sb	2E+4	7E+4	3E-5	1E-7	3E-4	3E-3
	W, see ¹¹⁵ Sb	-	1E+5	6E-5	2E-7	-	-
51 Antimony-116 ²	D, see ¹¹⁵ Sb	7E+4	3E+5	1E-4	4E-7	-	-
	St. wall (9E+4)	-	-	-	-	1E-3	1E-2
	W, see ¹¹⁵ Sb	-	3E+5	1E-4	5E-7	-	-
51 Antimony-117	D, see ¹¹⁵ Sb	7E+4	2E+5	9E-5	3E-7	9E-4	9E-3
	W, see ¹¹⁵ Sb	-	3E+5	1E-4	4E-7	-	-
51 Antimony-118m	D, see ¹¹⁵ Sb	6E+3	2E+4	8E-6	3E-8	7E-5	7E-4
	W, see ¹¹⁵ Sb	5E+3	2E+4	9E-6	3E-8	-	-
51 Antimony-119	D, see ¹¹⁵ Sb	2E+4	5E+4	2E-5	6E-8	2E-4	2E-3
	W, see ¹¹⁵ Sb	2E+4	3E+4	1E-5	4E-8	-	-
51 Antimony-120 ² (16 min)	D, see ¹¹⁵ Sb	1E+5	4E+5	2E-4	6E-7	-	-
	St. wall (2E+5)	-	-	-	-	2E-3	2E-2
	W, see ¹¹⁵ Sb	-	5E+5	2E-4	7E-7	-	-
51 Antimony-120 (5.76 d)	D, see ¹¹⁵ Sb	1E+3	2E+3	9E-7	3E-9	1E-5	1E-4
	W, see ¹¹⁵ Sb	9E+2	1E+3	5E-7	2E-9	-	-
51 Antimony-122	D, see ¹¹⁵ Sb	8E+2	2E+3	1E-6	3E-9	-	-
	LLI wall (8E+2)	-	-	-	-	1E-5	1E-4
	W, see ¹¹⁵ Sb	7E+2	1E+3	4E-7	2E-9	-	-
51 Antimony-124m ²	D, see ¹¹⁵ Sb	3E+5	8E+5	4E-4	1E-6	3E-3	3E-2
	W, see ¹¹⁵ Sb	2E+5	6E+5	2E-4	8E-7	-	-
51 Antimony-124	D, see ¹¹⁵ Sb	6E+2	9E+2	4E-7	1E-9	7E-6	7E-5
	W, see ¹¹⁵ Sb	5E+2	2E+2	1E-7	3E-10	-	-
51 Antimony-125	D, see ¹¹⁵ Sb	2E+3	2E+3	1E-6	3E-9	3E-5	3E-4
	W, see ¹¹⁵ Sb	-	5E+2	2E-7	7E-10	-	-
51 Antimony-126m ²	D, see ¹¹⁵ Sb	5E+4	2E+5	8E-5	3E-7	-	-
	St. wall (7E+4)	-	-	-	-	9E-4	9E-3
	W, see ¹¹⁵ Sb	-	2E+5	8E-5	3E-7	-	-

51 Antimony-126	D, see ¹¹⁵ Sb	6E+2	1E+3	5E-7	2E-9	7E-6	7E-5
	W, see ¹¹⁵ Sb	5E+2	5E+2	2E-7	7E-10	-	-
51 Antimony-127	D, see ¹¹⁵ Sb	8E+2	2E+3	9E-7	3E-9	-	-
	LLI wall (8E+2)	-	-	-	-	1E-5	1E-4
	W, see ¹¹⁵ Sb	7E+2	9E+2	4E-7	1E-9	-	-
51 Antimony-128 ² (10.4 min)	D, see ¹¹⁵ Sb	8E+4	4E+5	2E-4	5E-7	-	-
	St. wall (1E+5)	-	-	-	-	1E-3	1E-2
	W, see ¹¹⁵ Sb	-	4E+5	2E-4	6E-7	-	-
51 Antimony-128 (9.01 h)	D, see ¹¹⁵ Sb	1E+3	4E+3	2E-6	6E-9	2E-5	2E-4
	W, see ¹¹⁵ Sb	-	3E+3	1E-6	5E-9	-	-
51 Antimony-129	D, see ¹¹⁵ Sb	3E+3	9E+3	4E-6	1E-8	4E-5	4E-4
	W, see ¹¹⁵ Sb	-	9E+3	4E-6	1E-8	-	-
51 Antimony-130 ²	D, see ¹¹⁵ Sb	2E+4	6E+4	3E-5	9E-8	3E-4	3E-3
	W, see ¹¹⁵ Sb	-	8E+4	3E-5	1E-7	-	-
51 Antimony-131 ²	D, see ¹¹⁵ Sb	1E+4	2E+4	1E-5	-	-	-
	Thyroid (2E+4)	-	Thyroid (4E+4)	-	6E-8	2E-4	2E-3
	W, see ¹¹⁵ Sb	-	2E+4	1E-5	-	-	-
		-	Thyroid (4E+4)	-	6E-8	-	-
52 Tellurium-116	D, all compounds except those given for W	8E+3	2E+4	9E-6	3E-8	1E-4	1E-3
	W, oxides, hydroxides, and nitrates	-	3E+4	1E-5	4E-8	-	-
52 Tellurium-121m	D, see ¹¹⁶ Te	5E+2	2E+2	8E-8	-	-	-
	Bone surf (7E+2)	-	Bone surf (4E+2)	-	5E-10	1E-5	1E-4
	W, see ¹¹⁶ Te	-	4E+2	2E-7	6E-10	-	-
52 Tellurium-121	D, see ¹¹⁶ Te	3E+3	4E+3	2E-6	6E-9	4E-5	4E-4
	W, see ¹¹⁶ Te	-	3E+3	1E-6	4E-9	-	-

52 Tellurium-123m D, see ¹¹⁶ Te	6E+2 Bone surf (1E+3)	2E+2 Bone surf (5E+2)	9E-8 -	- 8E-10	- 1E-5	- 1E-4
W, see ¹¹⁶ Te	-	5E+2	2E-7	8E-10	-	-
52 Tellurium-123 D, see ¹¹⁶ Te	5E+2 Bone surf (1E+3)	2E+2 Bone surf (5E+2)	8E-8 -	- 7E-10	- 2E-5	- 2E-4
W, see ¹¹⁶ Te	-	4E+2 Bone surf (1E+3)	2E-7 -	- 2E-9	- -	- -
52 Tellurium-125m D, see ¹¹⁶ Te	1E+3 Bone surf (1E+3)	4E+2 Bone surf (1E+3)	2E-7 -	- 1E-9	- 2E-5	- 2E-4
W, see ¹¹⁶ Te	-	7E+2	3E-7	1E-9	-	-
52 Tellurium-127m D, see ¹¹⁶ Te	6E+2	3E+2 Bone surf (4E+2)	1E-7 -	- 6E-10	9E-6 -	9E-5 -
W, see ¹¹⁶ Te	-	3E+2	1E-7	4E-10	-	-
52 Tellurium-127 D, see ¹¹⁶ Te	7E+3	2E+4	9E-6	3E-8	1E-4	1E-3
W, see ¹¹⁶ Te	-	2E+4	7E-6	2E-8	-	-
52 Tellurium-129m D, see ¹¹⁶ Te	5E+2	6E+2	3E-7	9E-10	7E-6	7E-5
W, see ¹¹⁶ Te	-	2E+2	1E-7	3E-10	-	-
52 Tellurium-129 ² D, see ¹¹⁶ Te	3E+4	6E+4	3E-5	9E-8	4E-4	4E-3
W, see ¹¹⁶ Te	-	7E+4	3E-5	1E-7	-	-
52 Tellurium-131m D, see ¹¹⁶ Te	3E+2 Thyroid (6E+2)	4E+2 Thyroid (1E+3)	2E-7 -	- 2E-9	- 8E-6	- 8E-5
W, see ¹¹⁶ Te	-	4E+2 Thyroid (9E+2)	2E-7 -	- 1E-9	- -	- -
52 Tellurium-131 ² D, see ¹¹⁶ Te	3E+3 Thyroid	5E+3 Thyroid	2E-6	-	-	-

		(6E+3)	(1E+4)	-	2E-8	8E-5	8E-4
	W, see ¹¹⁶ Te	-	5E+3 Thyroid	2E-6	-	-	-
		-	(1E+4)	-	2E-8	-	-
52 Tellurium-132	D, see ¹¹⁶ Te	2E+2 Thyroid	2E+2 Thyroid	9E-8	-	-	-
		(7E+2)	(8E+2)	-	1E-9	9E-6	9E-5
	W, see ¹¹⁶ Te	-	2E+2 Thyroid	9E-8	-	-	-
		-	(6E+2)	-	9E-10	-	-
52 Tellurium-133m ²	D, see ¹¹⁶ Te	3E+3 Thyroid	5E+3 Thyroid	2E-6	-	-	-
		(6E+3)	(1E+4)	-	2E-8	9E-5	9E-4
	W, see ¹¹⁶ Te	-	5E+3 Thyroid	2E-6	-	-	-
		-	(1E+4)	-	2E-8	-	-
52 Tellurium-133 ²	D, see ¹¹⁶ Te	1E+4 Thyroid	2E+4 Thyroid	9E-6	-	-	-
		(3E+4)	(6E+4)	-	8E-8	4E-4	4E-3
	W, see ¹¹⁶ Te	-	2E+4 Thyroid	9E-6	-	-	-
		-	(6E+4)	-	8E-8	-	-
52 Tellurium-134 ²	D, see ¹¹⁶ Te	2E+4 Thyroid	2E+4 Thyroid	1E-5	-	-	-
		(2E+4)	(5E+4)	-	7E-8	3E-4	3E-3
	W, see ¹¹⁶ Te	-	2E+4 Thyroid	1E-5	-	-	-
		-	(5E+4)	-	7E-8	-	-
53 Iodine-120m ²	D, all compounds	1E+4 Thyroid	2E+4	9E-6	3E-8	-	-
		(1E+4)	-	-	-	2E-4	2E-3
53 Iodine-120 ²	D, all compounds	4E+3 Thyroid	9E+3 Thyroid	4E-6	-	-	-
		(8E+3)	(1E+4)	-	2E-8	1E-4	1E-3
53 Iodine-121	D, all compounds	1E+4 Thyroid	2E+4 Thyroid	8E-6	-	-	-
		(3E+4)	(5E+4)	-	7E-8	4E-4	4E-3
53 Iodine-123	D, all compounds	3E+3	6E+3	3E-6	-	-	-

		Thyroid (1E+4)	Thyroid (2E+4)	-	2E-8	1E-4	1E-3
53 Iodine-124	D, all compounds	5E+1 Thyroid (2E+2)	8E+1 Thyroid (3E+2)	3E-8 -	- 4E-10	- 2E-6	- 2E-5
53 Iodine-125	D, all compounds	4E+1 Thyroid (1E+2)	6E+1 Thyroid (2E+2)	3E-8 -	- 3E-10	- 2E-6	- 2E-5
53 Iodine-126	D, all compounds	2E+1 Thyroid (7E+1)	4E+1 Thyroid (1E+2)	1E-8 -	- 2E-10	- 1E-6	- 1E-5
53 Iodine-128 ²	D, all compounds	4E+4 St. wall (6E+4)	1E+5 -	5E-5 -	2E-7 -	- 8E-4	- 8E-3
53 Iodine-129	D, all compounds	5E+0 Thyroid (2E+1)	9E+0 Thyroid (3E+1)	4E-9 -	- 4E-11	- 2E-7	- 2E-6
53 Iodine-130	D, all compounds	4E+2 Thyroid (1E+3)	7E+2 Thyroid (2E+3)	3E-7 -	- 3E-9	- 2E-5	- 2E-4
53 Iodine-131	D, all compounds	3E+1 Thyroid (9E+1)	5E+1 Thyroid (2E+2)	2E-8 -	- 2E-10	- 1E-6	- 1E-5
53 Iodine-132m ²	D, all compounds	4E+3 Thyroid (1E+4)	8E+3 Thyroid (2E+4)	4E-6 -	- 3E-8	- 1E-4	- 1E-3
53 Iodine-132	D, all compounds	4E+3 Thyroid (9E+3)	8E+3 Thyroid (1E+4)	3E-6 -	- 2E-8	- 1E-4	- 1E-3
53 Iodine-133	D, all compounds	1E+2 Thyroid (5E+2)	3E+2 Thyroid (9E+2)	1E-7 -	- 1E-9	- 7E-6	- 7E-5
53 Iodine-134 ²	D, all compounds	2E+4 Thyroid (3E+4)	5E+4 -	2E-5 -	6E-8 -	- 4E-4	- 4E-3
53 Iodine-135	D, all compounds	8E+2 Thyroid	2E+3 Thyroid	7E-7	-	-	-

		(3E+3)	(4E+3)	-	6E-9	3E-5	3E-4
54 Xenon-120 ²	Submersion ¹	-	-	1E-5	4E-8	-	-
54 Xenon-121 ²	Submersion ¹	-	-	2E-6	1E-8	-	-
54 Xenon-122	Submersion ¹	-	-	7E-5	3E-7	-	-
54 Xenon-123	Submersion ¹	-	-	6E-6	3E-8	-	-
54 Xenon-125	Submersion ¹	-	-	2E-5	7E-8	-	-
54 Xenon-127	Submersion ¹	-	-	1E-5	6E-8	-	-
54 Xenon-129m	Submersion ¹	-	-	2E-4	9E-7	-	-
54 Xenon-131m	Submersion ¹	-	-	4E-4	2E-6	-	-
54 Xenon-133m	Submersion ¹	-	-	1E-4	6E-7	-	-
54 Xenon-133	Submersion ¹	-	-	1E-4	5E-7	-	-
54 Xenon-135m ²	Submersion ¹	-	-	9E-6	4E-8	-	-
54 Xenon-135	Submersion ¹	-	-	1E-5	7E-8	-	-
54 Xenon-138 ²	Submersion ¹	-	-	4E-6	2E-8	-	-
55 Cesium-125 ²	D, all compounds	5E+4 St. wall (9E+4)	1E+5	6E-5	2E-7	-	-
			-	-	-	1E-3	1E-2
55 Cesium-127	D, all compounds	6E+4	9E+4	4E-5	1E-7	9E-4	9E-3
55 Cesium-129	D, all compounds	2E+4	3E+4	1E-5	5E-8	3E-4	3E-3
55 Cesium-130 ²	D, all compounds	6E+4 St. wall (1E+5)	2E+5	8E-5	3E-7	-	-
			-	-	-	1E-3	1E-2
55 Cesium-131	D, all compounds	2E+4	3E+4	1E-5	4E-8	3E-4	3E-3
55 Cesium-132	D, all compounds	3E+3	4E+3	2E-6	6E-9	4E-5	4E-4
55 Cesium-134m	D, all compounds	1E+5 St. wall (1E+5)	1E+5	6E-5	2E-7	-	-
			-	-	-	2E-3	2E-2
55 Cesium-134	D, all compounds	7E+1	1E+2	4E-8	2E-10	9E-7	9E-6

55 Cesium-135m ²	D, all compounds	1E+5	2E+5	8E-5	3E-7	1E-3	1E-2
55 Cesium-135	D, all compounds	7E+2	1E+3	5E-7	2E-9	1E-5	1E-4
55 Cesium-136	D, all compounds	4E+2	7E+2	3E-7	9E-10	6E-6	6E-5
55 Cesium-137	D, all compounds	1E+2	2E+2	6E-8	2E-10	1E-6	1E-5
55 Cesium-138 ²	D, all compounds	2E+4	6E+4	2E-5	8E-8	-	-
	St. wall (3E+4)	-	-	-	-	4E-4	4E-3
56 Barium-126 ²	D, all compounds	6E+3	2E+4	6E-6	2E-8	8E-5	8E-4
56 Barium-128	D, all compounds	5E+2	2E+3	7E-7	2E-9	7E-6	7E-5
56 Barium-131m ²	D, all compounds	4E+5	1E+6	6E-4	2E-6	-	-
	St. wall (5E+5)	-	-	-	-	7E-3	7E-2
56 Barium-131	D, all compounds	3E+3	8E+3	3E-6	1E-8	4E-5	4E-4
56 Barium-133m	D, all compounds	2E+3	9E+3	4E-6	1E-8	-	-
	LLI wall (3E+3)	-	-	-	-	4E-5	4E-4
56 Barium-133	D, all compounds	2E+3	7E+2	3E-7	9E-10	2E-5	2E-4
56 Barium-135m	D, all compounds	3E+3	1E+4	5E-6	2E-8	4E-5	4E-4
56 Barium-139 ²	D, all compounds	1E+4	3E+4	1E-5	4E-8	2E-4	2E-3
56 Barium-140	D, all compounds	5E+2	1E+3	6E-7	2E-9	-	-
	LLI wall (6E+2)	-	-	-	-	8E-6	8E-5
56 Barium-141 ²	D, all compounds	2E+4	7E+4	3E-5	1E-7	3E-4	3E-3
56 Barium-142 ²	D, all compounds	5E+4	1E+5	6E-5	2E-7	7E-4	7E-3
57 Lanthanum-131 ²	D, all compounds except those given for W	5E+4	1E+5	5E-5	2E-7	6E-4	6E-3
	W, oxides and hydroxides	-	2E+5	7E-5	2E-7	-	-
57 Lanthanum-132	D, see ¹³¹ La	3E+3	1E+4	4E-6	1E-8	4E-5	4E-4

	W, see ¹³¹ La	-	1E+4	5E-6	2E-8	-	-
57 Lanthanum-135	D, see ¹³¹ La	4E+4	1E+5	4E-5	1E-7	5E-4	5E-3
	W, see ¹³¹ La	-	9E+4	4E-5	1E-7	-	-
57 Lanthanum-137	D, see ¹³¹ La	1E+4	6E+1	3E-8	-	2E-4	2E-3
			Liver				
		-	(7E+1)	-	1E-10	-	-
	W, see ¹³¹ La	-	3E+2	1E-7	-	-	-
			Liver				
		-	(3E+2)	-	4E-10	-	-
57 Lanthanum-138	D, see ¹³¹ La	9E+2	4E+0	1E-9	5E-12	1E-5	1E-4
	W, see ¹³¹ La	-	1E+1	6E-9	2E-11	-	-
57 Lanthanum-140	D, see ¹³¹ La	6E+2	1E+3	6E-7	2E-9	9E-6	9E-5
	W, see ¹³¹ La	-	1E+3	5E-7	2E-9	-	-
57 Lanthanum-141	D, see ¹³¹ La	4E+3	9E+3	4E-6	1E-8	5E-5	5E-4
	W, see ¹³¹ La	-	1E+4	5E-6	2E-8	-	-
57 Lanthanum-142 ²	D, see ¹³¹ La	8E+3	2E+4	9E-6	3E-8	1E-4	1E-3
	W, see ¹³¹ La	-	3E+4	1E-5	5E-8	-	-
57 Lanthanum-143 ²	D, see ¹³¹ La	4E+4	1E+5	4E-5	1E-7	-	-
			St. wall				
		-	(4E+4)	-	-	5E-4	5E-3
	W, see ¹³¹ La	-	9E+4	4E-5	1E-7	-	-
58 Cerium-134	W, all compounds except those given for Y	5E+2	7E+2	3E-7	1E-9	-	-
			LLI wall				
		-	(6E+2)	-	-	8E-6	8E-5
	Y, oxides, hydroxides, and fluorides	-	7E+2	3E-7	9E-10	-	-
58 Cerium-135	W, see ¹³⁴ Ce	2E+3	4E+3	2E-6	5E-9	2E-5	2E-4
	Y, see ¹³⁴ Ce	-	4E+3	1E-6	5E-9	-	-
58 Cerium-137m	W, see ¹³⁴ Ce	2E+3	4E+3	2E-6	6E-9	-	-
			LLI wall				
		-	(2E+3)	-	-	3E-5	3E-4
	Y, see ¹³⁴ Ce	-	4E+3	2E-6	5E-9	-	-
58 Cerium-137	W, see ¹³⁴ Ce	5E+4	1E+5	6E-5	2E-7	7E-4	7E-3
	Y, see ¹³⁴ Ce	-	1E+5	5E-5	2E-7	-	-
58 Cerium-139	W, see ¹³⁴ Ce	5E+3	8E+2	3E-7	1E-9	7E-5	7E-4

	Y, see ¹³⁴ Ce	-	7E+2	3E-7	9E-10	-	-
58 Cerium-141	W, see ¹³⁴ Ce	2E+3	7E+2	3E-7	1E-9	-	-
	LLI wall (2E+3)	-	-	-	-	3E-5	3E-4
	Y, see ¹³⁴ Ce	-	6E+2	2E-7	8E-10	-	-
58 Cerium-143	W, see ¹³⁴ Ce	1E+3	2E+3	8E-7	3E-9	-	-
	LLI wall (1E+3)	-	-	-	-	2E-5	2E-4
	Y, see ¹³⁴ Ce	-	2E+3	7E-7	2E-9	-	-
58 Cerium-144	W, see ¹³⁴ Ce	2E+2	3E+1	1E-8	4E-11	-	-
	LLI wall (3E+2)	-	-	-	-	3E-6	3E-5
	Y, see ¹³⁴ Ce	-	1E+1	6E-9	2E-11	-	-
59 Praseodymium-136 ²	W, all compounds except those given for Y	5E+4	2E+5	1E-4	3E-7	-	-
	St. wall (7E+4)	-	-	-	-	1E-3	1E-2
	Y, oxides, hydroxides, carbides, and fluorides	-	2E+5	9E-5	3E-7	-	-
59 Praseodymium-137 ²	W, see ¹³⁶ Pr	4E+4	2E+5	6E-5	2E-7	5E-4	5E-3
	Y, see ¹³⁶ Pr	-	1E+5	6E-5	2E-7	-	-
59 Praseodymium-138m	W, see ¹³⁶ Pr	1E+4	5E+4	2E-5	8E-8	1E-4	1E-3
	Y, see ¹³⁶ Pr	-	4E+4	2E-5	6E-8	-	-
59 Praseodymium-139	W, see ¹³⁶ Pr	4E+4	1E+5	5E-5	2E-7	6E-4	6E-3
	Y, see ¹³⁶ Pr	-	1E+5	5E-5	2E-7	-	-
59 Praseodymium-142m ²	W, see ¹³⁶ Pr	8E+4	2E+5	7E-5	2E-7	1E-3	1E-2
	Y, see ¹³⁶ Pr	-	1E+5	6E-5	2E-7	-	-
59 Praseodymium-142	W, see ¹³⁶ Pr	1E+3	2E+3	9E-7	3E-9	1E-5	1E-4
	Y, see ¹³⁶ Pr	-	2E+3	8E-7	3E-9	-	-
59 Praseodymium-143	W, see ¹³⁶ Pr	9E+2	8E+2	3E-7	1E-9	-	-
	LLI wall (1E+3)	-	-	-	-	2E-5	2E-4
	Y, see ¹³⁶ Pr	-	7E+2	3E-7	9E-10	-	-

59 Praseodymium-144 ²	W, see ¹³⁶ Pr	3E+4 St. wall (4E+4)	1E+5	5E-5	2E-7	-	-
	Y, see ¹³⁶ Pr	-	1E+5	5E-5	2E-7	-	-
59 Praseodymium-145	W, see ¹³⁶ Pr	3E+3	9E+3	4E-6	1E-8	4E-5	4E-4
	Y, see ¹³⁶ Pr	-	8E+3	3E-6	1E-8	-	-
59 Praseodymium-147 ²	W, see ¹³⁶ Pr	5E+4 St. wall (8E+4)	2E+5	8E-5	3E-7	-	-
	Y, see ¹³⁶ Pr	-	2E+5	8E-5	3E-7	-	-
60 Neodymium-136 ²	W, all compounds except those given for Y	1E+4	6E+4	2E-5	8E-8	2E-4	2E-3
	Y, oxides, hydroxides, carbides, and fluorides	-	5E+4	2E-5	8E-8	-	-
60 Neodymium-138	W, see ¹³⁶ Nd	2E+3	6E+3	3E-6	9E-9	3E-5	3E-4
	Y, see ¹³⁶ Nd	-	5E+3	2E-6	7E-9	-	-
60 Neodymium-139m	W, see ¹³⁶ Nd	5E+3	2E+4	7E-6	2E-8	7E-5	7E-4
	Y, see ¹³⁶ Nd	-	1E+4	6E-6	2E-8	-	-
60 Neodymium-139 ²	W, see ¹³⁶ Nd	9E+4	3E+5	1E-4	5E-7	1E-3	1E-2
	Y, see ¹³⁶ Nd	-	3E+5	1E-4	4E-7	-	-
60 Neodymium-141	W, see ¹³⁶ Nd	2E+5	7E+5	3E-4	1E-6	2E-3	2E-2
	Y, see ¹³⁶ Nd	-	6E+5	3E-4	9E-7	-	-
60 Neodymium-147	W, see ¹³⁶ Nd	1E+3 LLI wall (1E+3)	9E+2	4E-7	1E-9	-	-
	Y, see ¹³⁶ Nd	-	8E+2	4E-7	1E-9	-	-
60 Neodymium-149 ²	W, see ¹³⁶ Nd	1E+4	3E+4	1E-5	4E-8	1E-4	1E-3
	Y, see ¹³⁶ Nd	-	2E+4	1E-5	3E-8	-	-
60 Neodymium-151 ²	W, see ¹³⁶ Nd	7E+4	2E+5	8E-5	3E-7	9E-4	9E-3
	Y, see ¹³⁶ Nd	-	2E+5	8E-5	3E-7	-	-
61 Promethium-141 ²	W, all compounds except those						

	given for Y	5E+4 St. wall (6E+4)	2E+5 -	8E-5 -	3E-7 -	- 8E-4	- 8E-3
	Y, oxides, hydroxides, carbides, and fluorides	-	2E+5	7E-5	2E-7	-	-
61 Promethium-143	W, see ¹⁴¹ Pm Y, see ¹⁴¹ Pm	5E+3 -	6E+2 7E+2	2E-7 3E-7	8E-10 1E-9	7E-5 -	7E-4 -
61 Promethium-144	W, see ¹⁴¹ Pm Y, see ¹⁴¹ Pm	1E+3 -	1E+2 1E+2	5E-8 5E-8	2E-10 2E-10	2E-5 -	2E-4 -
61 Promethium-145	W, see ¹⁴¹ Pm	1E+4	2E+2	7E-8	-	1E-4	1E-3
		-	Bone surf (2E+2)	-	3E-10	-	-
	Y, see ¹⁴¹ Pm	-	2E+2	8E-8	3E-10	-	-
61 Promethium-146	W, see ¹⁴¹ Pm Y, see ¹⁴¹ Pm	2E+3 -	5E+1 4E+1	2E-8 2E-8	7E-11 6E-11	2E-5 -	2E-4 -
61 Promethium-147	W, see ¹⁴¹ Pm	4E+3	1E+2	5E-8	-	-	-
		LLI wall (5E+3)	Bone surf (2E+2)	-	3E-10	7E-5	7E-4
	Y, see ¹⁴¹ Pm	-	1E+2	6E-8	2E-10	-	-
61 Promethium-148m	W, see ¹⁴¹ Pm Y, see ¹⁴¹ Pm	7E+2 -	3E+2 3E+2	1E-7 1E-7	4E-10 5E-10	1E-5 -	1E-4 -
61 Promethium-148	W, see ¹⁴¹ Pm	4E+2	5E+2	2E-7	8E-10	-	-
		LLI wall (5E+2)	-	-	-	7E-6	7E-5
	Y, see ¹⁴¹ Pm	-	5E+2	2E-7	7E-10	-	-
61 Promethium-149	W, see ¹⁴¹ Pm	1E+3	2E+3	8E-7	3E-9	-	-
		LLI wall (1E+3)	-	-	-	2E-5	2E-4
	Y, see ¹⁴¹ Pm	-	2E+3	8E-7	2E-9	-	-
61 Promethium-150	W, see ¹⁴¹ Pm Y, see ¹⁴¹ Pm	5E+3 -	2E+4 2E+4	8E-6 7E-6	3E-8 2E-8	7E-5 -	7E-4 -
61 Promethium-151	W, see ¹⁴¹ Pm Y, see ¹⁴¹ Pm	2E+3 -	4E+3 3E+3	1E-6 1E-6	5E-9 4E-9	2E-5 -	2E-4 -

62 Samarium-141m ²	W, all compounds	3E+4	1E+5	4E-5	1E-7	4E-4	4E-3
62 Samarium-141 ²	W, all compounds	5E+4 St. wall (6E+4)	2E+5 - -	8E-5 - -	2E-7 - -	- 8E-4	- 8E-3
62 Samarium-142 ²	W, all compounds	8E+3	3E+4	1E-5	4E-8	1E-4	1E-3
62 Samarium-145	W, all compounds	6E+3	5E+2	2E-7	7E-10	8E-5	8E-4
62 Samarium-146	W, all compounds	1E+1 Bone surf (3E+1)	4E-2 Bone surf (6E-2)	1E-11 - -	- 9E-14	- 3E-7	- 3E-6
62 Samarium-147	W, all compounds	2E+1 Bone surf (3E+1)	4E-2 Bone surf (7E-2)	2E-11 - -	- 1E-13	- 4E-7	- 4E-6
62 Samarium-151	W, all compounds	1E+4 LLI wall (1E+4)	1E+2 Bone surf (2E+2)	4E-8 - -	- 2E-10	- 2E-4	- 2E-3
62 Samarium-153	W, all compounds	2E+3 LLI wall (2E+3)	3E+3 - -	1E-6 - -	4E-9 - -	- 3E-5	- 3E-4
62 Samarium-155 ²	W, all compounds	6E+4 St. wall (8E+4)	2E+5 - -	9E-5 - -	3E-7 - -	- 1E-3	- 1E-2
62 Samarium-156	W, all compounds	5E+3	9E+3	4E-6	1E-8	7E-5	7E-4
63 Europium-145	W, all compounds	2E+3	2E+3	8E-7	3E-9	2E-5	2E-4
63 Europium-146	W, all compounds	1E+3	1E+3	5E-7	2E-9	1E-5	1E-4
63 Europium-147	W, all compounds	3E+3	2E+3	7E-7	2E-9	4E-5	4E-4
63 Europium-148	W, all compounds	1E+3	4E+2	1E-7	5E-10	1E-5	1E-4
63 Europium-149	W, all compounds	1E+4	3E+3	1E-6	4E-9	2E-4	2E-3
63 Europium-150 (12.62 h)	W, all compounds	3E+3	8E+3	4E-6	1E-8	4E-5	4E-4

63 Europium-150 (34.2 y)	W, all compounds	8E+2	2E+1	8E-9	3E-11	1E-5	1E-4
63 Europium-152m	W, all compounds	3E+3	6E+3	3E-6	9E-9	4E-5	4E-4
63 Europium-152	W, all compounds	8E+2	2E+1	1E-8	3E-11	1E-5	1E-4
63 Europium-154	W, all compounds	5E+2	2E+1	8E-9	3E-11	7E-6	7E-5
63 Europium-155	W, all compounds	E+3	9E+1 Bone surf (1E+2)	4E-8	-	5E-5	5E-4
		-		-	2E-10	-	-
63 Europium-156	W, all compounds	6E+2	5E+2	2E-7	6E-10	8E-6	8E-5
63 Europium-157	W, all compounds	2E+3	5E+3	2E-6	7E-9	3E-5	3E-4
63 Europium-158 ²	W, all compounds	2E+4	6E+4	2E-5	8E-8	3E-4	3E-3
64 Gadolinium-145 ²	D, all compounds except those given for W	5E+4 St. wall (5E+4)	2E+5	6E-5	2E-7	-	-
		-	-	-	-	6E-4	6E-3
	W, oxides, hydroxides, and fluorides	-	2E+5	7E-5	2E-7	-	-
64 Gadolinium-146	D, see ¹⁴⁵ Gd	1E+3	1E+2	5E-8	2E-10	2E-5	2E-4
	W, see ¹⁴⁵ Gd	-	3E+2	1E-7	4E-10	-	-
64 Gadolinium-147	D, see ¹⁴⁵ Gd	2E+3	4E+3	2E-6	6E-9	3E-5	3E-4
	W, see ¹⁴⁵ Gd	-	4E+3	1E-6	5E-9	-	-
64 Gadolinium-148	D, see ¹⁴⁵ Gd	1E+1 Bone surf (2E+1)	8E-3 Bone surf (2E-2)	3E-12	-	-	-
		-	-	-	2E-14	3E-7	3E-6
	W, see ¹⁴⁵ Gd	-	3E-2 Bone surf (6E-2)	1E-11	-	-	-
		-		-	8E-14	-	-
64 Gadolinium-149	D, see ¹⁴⁵ Gd	3E+3	2E+3	9E-7	3E-9	4E-5	4E-4
	W, see ¹⁴⁵ Gd	-	2E+3	1E-6	3E-9	-	-
64 Gadolinium-151	D, see ¹⁴⁵ Gd	6E+3	4E+2 Bone	2E-7	-	9E-5	9E-4

		-	surf (6E+2)	-	9E-10	-	-
	W, see ¹⁴⁵ Gd	-	1E+3	5E-7	2E-9	-	-
64 Gadolinium-152	D, see ¹⁴⁵ Gd	2E+1 Bone surf (3E+1)	1E-2 Bone surf (2E-2)	4E-12	-	-	-
	W, see ¹⁴⁵ Gd	-	4E-2 Bone surf (8E-2)	2E-11	-	-	-
64 Gadolinium-153	D, see ¹⁴⁵ Gd	5E+3	1E+2 Bone surf (2E+2)	6E-8	-	6E-5	6E-4
	W, see ¹⁴⁵ Gd	-	6E+2	2E-7	8E-10	-	-
64 Gadolinium-159	D, see ¹⁴⁵ Gd	3E+3	8E+3	3E-6	1E-8	4E-5	4E-4
	W, see ¹⁴⁵ Gd	-	6E+3	2E-6	8E-9	-	-
65 Terbium-147 ²	W, all compounds	9E+3	3E+4	1E-5	5E-8	1E-4	1E-3
65 Terbium-149W	all compounds	5E+3	7E+2	3E-7	1E-9	7E-5	7E-4
65 Terbium-150W	all compounds	5E+3	2E+4	9E-6	3E-8	7E-5	7E-4
65 Terbium-151W	all compounds	4E+3	9E+3	4E-6	1E-8	5E-5	5E-4
65 Terbium-153W	all compounds	5E+3	7E+3	3E-6	1E-8	7E-5	7E-4
65 Terbium-154W	all compounds	2E+3	4E+3	2E-6	6E-9	2E-5	2E-4
65 Terbium-155W	all compounds	6E+3	8E+3	3E-6	1E-8	8E-5	8E-4
65 Terbium-156mW	all compounds (5.0h)	2E+4	3E+4	1E-5	4E-8	2E-4	2E-3
65 Terbium-156mW	all compounds (24.4h)	7E+3	8E+3	3E-6	1E-8	1E-4	1E-3
65 Terbium-156W	all compounds	1E+3	1E+3	6E-7	2E-9	1E-5	1E-4
65 Terbium-157W	all compounds	5E+4 LLI wall	3E+2 Bone surf	1E-7	-	-	-

		(5E+4)	(6E+2)	-	8E-10	7E-4	7E-3
65 Terbium-158W, all compounds		1E+3	2E+1	8E-9	3E-11	2E-5	2E-4
65 Terbium-160W, all compounds		8E+2	2E+2	9E-8	3E-10	1E-5	1E-4
65 Terbium-161W, all compounds		2E+3	2E+3	7E-7	2E-9	-	-
	LLI wall (2E+3)	-	-	-	-	3E-5	3E-4
66 Dysprosium-155 W, all compounds		9E+3	3E+4	1E-5	4E-8	1E-4	1E-3
66 Dysprosium-157 W, all compounds		2E+4	6E+4	3E-5	9E-8	3E-4	3E-3
66 Dysprosium-159 W, all compounds		1E+4	2E+3	1E-6	3E-9	2E-4	2E-3
66 Dysprosium-165 W, all compounds		1E+4	5E+4	2E-5	6E-8	2E-4	2E-3
66 Dysprosium-166 W, all compounds		6E+2	7E+2	3E-7	1E-9	-	-
	LLI wall (8E+2)	-	-	-	-	1E-5	1E-4
67 Holmium-155 ² W, all compounds		4E+4	2E+5	6E-5	2E-7	6E-4	6E-3
67 Holmium-157 ² W, all compounds		3E+5	1E+6	6E-4	2E-6	4E-3	4E-2
67 Holmium-159 ² W, all compounds		2E+5	1E+6	4E-4	1E-6	3E-3	3E-2
67 Holmium-161 W, all compounds		1E+5	4E+5	2E-4	6E-7	1E-3	1E-2
67 Holmium-162m ² W, all compounds		5E+4	3E+5	1E-4	4E-7	7E-4	7E-3
67 Holmium-162 ² W, all compounds		5E+5	2E+6	1E-3	3E-6	-	-
	St. wall (8E+5)	-	-	-	-	1E-2	1E-1
67 Holmium-164m ² W, all compounds		1E+5	3E+5	1E-4	4E-7	1E-3	1E-2
67 Holmium-164 ² W, all compounds		2E+5	6E+5	3E-4	9E-7	-	-
	St. wall (2E+5)	-	-	-	-	3E-3	3E-2
67 Holmium-166m W, all compounds		6E+2	7E+0	3E-9	9E-12	9E-6	9E-5
67 Holmium-166 W, all compounds		9E+2	2E+3	7E-7	2E-9	-	-
	LLI wall (9E+2)	-	-	-	-	1E-5	1E-4
67 Holmium-167 W, all compounds		2E+4	6E+4	2E-5	8E-8	2E-4	2E-3

68 Erbium-161	W, all compounds	2E+4	6E+4	3E-5	9E-8	2E-4	2E-3
68 Erbium-165	W, all compounds	6E+4	2E+5	8E-5	3E-7	9E-4	9E-3
68 Erbium-169	W, all compounds	3E+3 LLI wall (4E+3)	3E+3	1E-6	4E-9	- 5E-5	- 5E-4
68 Erbium-171	W, all compounds	4E+3	1E+4	4E-6	1E-8	5E-5	5E-4
68 Erbium-172	W, all compounds	1E+3 LLI wall (1E+3)	1E+3	6E-7	2E-9	- 2E-5	- 2E-4
69 Thulium-162 ²	W, all compounds	7E+4 St. wall (7E+4)	3E+5	1E-4	4E-7	- 1E-3	- 1E-2
69 Thulium-166W, all compounds		4E+3	1E+4	6E-6	2E-8	6E-5	6E-4
69 Thulium-167W, all compounds		2E+3 LLI wall (2E+3)	2E+3	8E-7	3E-9	- 3E-5	- 3E-4
69 Thulium-170W, all compounds		8E+2 LLI wall (1E+3)	2E+2	9E-8	3E-10	- 1E-5	- 1E-4
69 Thulium-171W, all compounds		1E+4 LLI wall (1E+4)	3E+2 Bone surf (6E+2)	1E-7	- 8E-10	- 2E-4	- 2E-3
69 Thulium-172W, all compounds		7E+2 LLI wall (8E+2)	1E+3	5E-7	2E-9	- 1E-5	- 1E-4
69 Thulium-173W, all compounds		4E+3	1E+4	5E-6	2E-8	6E-5	6E-4
69 Thulium-175 ²	W, all compounds	7E+4 St. wall (9E+4)	3E+5	1E-4	4E-7	- 1E-3	- 1E-2
70 Ytterbium-162 ²	W, all compounds except those given for Y	7E+4	3E+5	1E-4	4E-7	1E-3	1E-2
	Y, oxides, hydroxides, and fluorides	-	3E+5	1E-4	4E-7	-	-

70 Ytterbium-166	W, see ¹⁶² Yb	1E+3	2E+3	8E-7	3E-9	2E-5	2E-4
	Y, see ¹⁶² Yb	-	2E+3	8E-7	3E-9	-	-
70 Ytterbium-167 ²	W, see ¹⁶² Yb	3E+5	8E+5	3E-4	1E-6	4E-3	4E-2
	Y, see ¹⁶² Yb	-	7E+5	3E-4	1E-6	-	-
70 Ytterbium-169	W, see ¹⁶² Yb	2E+3	8E+2	4E-7	1E-9	2E-5	2E-4
	Y, see ¹⁶² Yb	-	7E+2	3E-7	1E-9	-	-
70 Ytterbium-175	W, see ¹⁶² Yb	3E+3	4E+3	1E-6	5E-9	-	-
	Y, see ¹⁶² Yb	LLI wall (3E+3)	-	-	-	4E-5	4E-4
70 Ytterbium-177 ²	W, see ¹⁶² Yb	2E+4	5E+4	2E-5	7E-8	2E-4	2E-3
	Y, see ¹⁶² Yb	-	5E+4	2E-5	6E-8	-	-
70 Ytterbium-178 ²	W, see ¹⁶² Yb	1E+4	4E+4	2E-5	6E-8	2E-4	2E-3
	Y, see ¹⁶² Yb	-	4E+4	2E-5	5E-8	-	-
71 Lutetium-169	W, all compounds except those given for Y	3E+3	4E+3	2E-6	6E-9	3E-5	3E-4
	Y, oxides, hydroxides, and fluorides	-	4E+3	2E-6	6E-9	-	-
71 Lutetium-170	W, see ¹⁶⁹ Lu	1E+3	2E+3	9E-7	3E-9	2E-5	2E-4
	Y, see ¹⁶⁹ Lu	-	2E+3	8E-7	3E-9	-	-
71 Lutetium-171	W, see ¹⁶⁹ Lu	2E+3	2E+3	8E-7	3E-9	3E-5	3E-4
	Y, see ¹⁶⁹ Lu	-	2E+3	8E-7	3E-9	-	-
71 Lutetium-172	W, see ¹⁶⁹ Lu	1E+3	1E+3	5E-7	2E-9	1E-5	1E-4
	Y, see ¹⁶⁹ Lu	-	1E+3	5E-7	2E-9	-	-
71 Lutetium-173	W, see ¹⁶⁹ Lu	5E+3	3E+2	1E-7	-	7E-5	7E-4
	Y, see ¹⁶⁹ Lu	-	Bone surf (5E+2)	-	6E-10	-	-
71 Lutetium-174m	W, see ¹⁶⁹ Lu	2E+3	2E+2	1E-7	-	-	-
	Y, see ¹⁶⁹ Lu	LLI wall (3E+3)	Bone surf (3E+2)	-	5E-10	4E-5	4E-4
		-	2E+2	9E-8	3E-10	-	-

71 Lutetium-174	W, see ¹⁶⁹ Lu	5E+3	1E+2 Bone surf (2E+2)	5E-8	-	7E-5	7E-4
	Y, see ¹⁶⁹ Lu	-	2E+2	6E-8	2E-10	-	-
71 Lutetium-176m	W, see ¹⁶⁹ Lu	8E+3	3E+4	1E-5	3E-8	1E-4	1E-3
	Y, see ¹⁶⁹ Lu	-	2E+4	9E-6	3E-8	-	-
71 Lutetium-176	W, see ¹⁶⁹ Lu	7E+2	5E+0 Bone surf (1E+1)	2E-9	-	1E-5	1E-4
	Y, see ¹⁶⁹ Lu	-	8E+0	3E-9	1E-11	-	-
71 Lutetium-177m	W, see ¹⁶⁹ Lu	7E+2	1E+2 Bone surf (1E+2)	5E-8	-	1E-5	1E-4
	Y, see ¹⁶⁹ Lu	-	8E+1	3E-8	1E-10	-	-
71 Lutetium-177	W, see ¹⁶⁹ Lu	2E+3 LLI wall (3E+3)	2E+3	9E-7	3E-9	-	-
	Y, see ¹⁶⁹ Lu	-	2E+3	9E-7	3E-9	-	-
71 Lutetium-178m ²	W, see ¹⁶⁹ Lu	5E+4 St. wall (6E+4)	2E+5	8E-5	3E-7	-	-
	Y, see ¹⁶⁹ Lu	-	2E+5	7E-5	2E-7	-	-
71 Lutetium-178 ²	W, see ¹⁶⁹ Lu	4E+4 St. wall (4E+4)	1E+5	5E-5	2E-7	-	-
	Y, see ¹⁶⁹ Lu	-	1E+5	5E-5	2E-7	-	-
71 Lutetium-179	W, see ¹⁶⁹ Lu	6E+3	2E+4	8E-6	3E-8	9E-5	9E-4
	Y, see ¹⁶⁹ Lu	-	2E+4	6E-6	3E-8	-	-
72 Hafnium-170	D, all compounds except those given for W	3E+3	6E+3	2E-6	8E-9	4E-5	4E-4

	W, oxides, hydroxides, carbides, and nitrates	-	5E+3	2E-6	6E-9	-	-
72 Hafnium-172	D, see ¹⁷⁰ Hf	1E+3	9E+0	4E-9	-	2E-5	2E-4
			Bone surf (2E+1)	-	3E-11	-	-
	W, see ¹⁷⁰ Hf	-	4E+1	2E-8	-	-	-
			Bone surf (6E+1)	-	8E-11	-	-
72 Hafnium-173	D, see ¹⁷⁰ Hf	5E+3	1E+4	5E-6	2E-8	7E-5	7E-4
	W, see ¹⁷⁰ Hf	-	1E+4	5E-6	2E-8	-	-
72 Hafnium-175	D, see ¹⁷⁰ Hf	3E+3	9E+2	4E-7	-	4E-5	4E-4
			Bone surf (1E+3)	-	1E-9	-	-
	W, see ¹⁷⁰ Hf	-	1E+3	5E-7	2E-9	-	-
72 Hafnium-177m ²	D, see ¹⁷⁰ Hf	2E+4	6E+4	2E-5	8E-8	3E-4	3E-3
	W, see ¹⁷⁰ Hf	-	9E+4	4E-5	1E-7	-	-
72 Hafnium-178m	D, see ¹⁷⁰ Hf	3E+2	1E+0	5E-10	-	3E-6	3E-5
			Bone surf (2E+0)	-	3E-12	-	-
	W, see ¹⁷⁰ Hf	-	5E+0	2E-9	-	-	-
			Bone surf (9E+0)	-	1E-11	-	-
72 Hafnium-179m	D, see ¹⁷⁰ Hf	1E+3	3E+2	1E-7	-	1E-5	1E-4
			Bone surf (6E+2)	-	8E-10	-	-
	W, see ¹⁷⁰ Hf	-	6E+2	3E-7	8E-10	-	-
72 Hafnium-180m	D, see ¹⁷⁰ Hf	7E+3	2E+4	9E-6	3E-8	1E-4	1E-3
	W, see ¹⁷⁰ Hf	-	3E+4	1E-5	4E-8	-	-
72 Hafnium-181	D, see ¹⁷⁰ Hf	1E+3	2E+2	7E-8	-	2E-5	2E-4
			Bone				

			surf (4E+2)	-	6E-10	-	-
	W, see ¹⁷⁰ Hf	-	4E+2	2E-7	6E-10	-	-
72 Hafnium-182m ²	D, see ¹⁷⁰ Hf	4E+4	9E+4	4E-5	1E-7	5E-4	5E-3
	W, see ¹⁷⁰ Hf	-	1E+5	6E-5	2E-7	-	-
72 Hafnium-182	D, see ¹⁷⁰ Hf	2E+2	8E-1	3E-10	-	-	-
	Bone surf (4E+2)		Bone surf (2E+0)	-	2E-12	5E-6	5E-5
	W, see ¹⁷⁰ Hf	-	3E+0	1E-9	-	-	-
		-	Bone surf (7E+0)	-	1E-11	-	-
72 Hafnium-183 ²	D, see ¹⁷⁰ Hf	2E+4	5E+4	2E-5	6E-8	3E-4	3E-3
	W, see ¹⁷⁰ Hf	-	6E+4	2E-5	8E-8	-	-
72 Hafnium-184	D, see ¹⁷⁰ Hf	2E+3	8E+3	3E-6	1E-8	3E-5	3E-4
	W, see ¹⁷⁰ Hf	-	6E+3	3E-6	9E-9	-	-
73 Tantalum-172 ²	W, all compounds except those given for Y	4E+4	1E+5	5E-5	2E-7	5E-4	5E-3
	Y, elemental Ta, oxides, hydroxides, halides, carbides, nitrates, and nitrides-		1E+5	4E-5	1E-7	-	-
73 Tantalum-173	W, see ¹⁷² Ta	7E+3	2E+4	8E-6	3E-8	9E-5	9E-4
	Y, see ¹⁷² Ta	-	2E+4	7E-6	2E-8	-	-
73 Tantalum-174 ²	W, see ¹⁷² Ta	3E+4	1E+5	4E-5	1E-7	4E-4	4E-3
	Y, see ¹⁷² Ta	-	9E+4	4E-5	1E-7	-	-
73 Tantalum-175	W, see ¹⁷² Ta	6E+3	2E+4	7E-6	2E-8	8E-5	8E-4
	Y, see ¹⁷² Ta	-	1E+4	6E-6	2E-8	-	-
73 Tantalum-176	W, see ¹⁷² Ta	4E+3	1E+4	5E-6	2E-8	5E-5	5E-4
	Y, see ¹⁷² Ta	-	1E+4	5E-6	2E-8	-	-
73 Tantalum-177	W, see ¹⁷² Ta	1E+4	2E+4	8E-6	3E-8	2E-4	2E-3
	Y, see ¹⁷² Ta	-	2E+4	7E-6	2E-8	-	-
73 Tantalum-178	W, see ¹⁷² Ta	2E+4	9E+4	4E-5	1E-7	2E-4	2E-3

	Y, see ^{172}Ta	-	7E+4	3E-5	1E-7	-	-
73 Tantalum-179	W, see ^{172}Ta	2E+4	5E+3	2E-6	8E-9	3E-4	3E-3
	Y, see ^{172}Ta	-	9E+2	4E-7	1E-9	-	-
73 Tantalum-180m	W, see ^{172}Ta	2E+4	7E+4	3E-5	9E-8	3E-4	3E-3
	Y, see ^{172}Ta	-	6E+4	2E-5	8E-8	-	-
73 Tantalum-180	W, see ^{172}Ta	1E+3	4E+2	2E-7	6E-10	2E-5	2E-4
	Y, see ^{172}Ta	-	2E+1	1E-8	3E-11	-	-
73 Tantalum-182m ²	W, see ^{172}Ta	2E+5	5E+5	2E-4	8E-7	-	-
	St. wall (2E+5)	-	-	-	-	3E-3	3E-2
	Y, see ^{172}Ta	-	4E+5	2E-4	6E-7	-	-
73 Tantalum-182	W, see ^{172}Ta	8E+2	3E+2	1E-7	5E-10	1E-5	1E-4
	Y, see ^{172}Ta	-	1E+2	6E-8	2E-10	-	-
73 Tantalum-183	W, see ^{172}Ta	9E+2	1E+3	5E-7	2E-9	-	-
	LLI wall (1E+3)	-	-	-	-	2E-5	2E-4
	Y, see ^{172}Ta	-	1E+3	4E-7	1E-9	-	-
73 Tantalum-184	W, see ^{172}Ta	2E+3	5E+3	2E-6	8E-9	3E-5	3E-4
	Y, see ^{172}Ta	-	5E+3	2E-6	7E-9	-	-
73 Tantalum-185 ²	W, see ^{172}Ta	3E+4	7E+4	3E-5	1E-7	4E-4	4E-3
	Y, see ^{172}Ta	-	6E+4	3E-5	9E-8	-	-
73 Tantalum-186 ²	W, see ^{172}Ta	5E+4	2E+5	1E-4	3E-7	-	-
	St. wall (7E+4)	-	-	-	-	1E-3	1E-2
	Y, see ^{172}Ta	-	2E+5	9E-5	3E-7	-	-
74 Tungsten-176	D, all compounds	1E+4	5E+4	2E-5	7E-8	1E-4	1E-3
74 Tungsten-177	D, all compounds	2E+4	9E+4	4E-5	1E-7	3E-4	3E-3
74 Tungsten-178	D, all compounds	5E+3	2E+4	8E-6	3E-8	7E-5	7E-4
74 Tungsten-179 ²	D, all compounds	5E+5	2E+6	7E-4	2E-6	7E-3	7E-2
74 Tungsten-181	D, all compounds	2E+4	3E+4	1E-5	5E-8	2E-4	2E-3
74 Tungsten-185	D, all compounds	2E+3	7E+3	3E-6	9E-9	-	-
	LLI wall						

		(3E+3)	-	-	-	4E-5	4E-4
74 Tungsten-187	D, all compounds	2E+3	9E+3	4E-6	1E-8	3E-5	3E-4
74 Tungsten-188	D, all compounds	4E+2	1E+3	5E-7	2E-9	-	-
		LLI wall (5E+2)	-	-	-	7E-6	7E-5
75 Rhenium-177 ²	D, all compounds except those given for W	9E+4	3E+5	1E-4	4E-7	-	-
		St. wall (1E+5)	-	-	-	2E-3	2E-2
	W, oxides, hydroxides, and nitrates	-	4E+5	1E-4	5E-7	-	-
75 Rhenium-178 ²	D, see ¹⁷⁷ Re	7E+4	3E+5	1E-4	4E-7	-	-
		St. wall (1E+5)	-	-	-	1E-3	1E-2
	W, see ¹⁷⁷ Re	-	3E+5	1E-4	4E-7	-	-
75 Rhenium-181	D, see ¹⁷⁷ Re	5E+3	9E+3	4E-6	1E-8	7E-5	7E-4
	W, see ¹⁷⁷ Re	-	9E+3	4E-6	1E-8	-	-
75 Rhenium-182 (12.7h)	D, see ¹⁷⁷ Re	7E+3	1E+4	5E-6	2E-8	9E-5	9E-4
	W, see ¹⁷⁷ Re	-	2E+4	6E-6	2E-8	-	-
75 Rhenium-182 (64.0h)	D, see ¹⁷⁷ Re	1E+3	2E+3	1E-6	3E-9	2E-5	2E-4
	W, see ¹⁷⁷ Re	-	2E+3	9E-7	3E-9	-	-
75 Rhenium-184m	D, see ¹⁷⁷ Re	2E+3	3E+3	1E-6	4E-9	3E-5	3E-4
	W, see ¹⁷⁷ Re	-	4E+2	2E-7	6E-10	-	-
75 Rhenium-184	D, see ¹⁷⁷ Re	2E+3	4E+3	1E-6	5E-9	3E-5	3E-4
	W, see ¹⁷⁷ Re	-	1E+3	6E-7	2E-9	-	-
75 Rhenium-186m	D, see ¹⁷⁷ Re	1E+3	2E+3	7E-7	-	-	-
		St. wall (2E+3)	St. wall (2E+3)	-	3E-9	2E-5	2E-4
	W, see ¹⁷⁷ Re	-	2E+2	6E-8	2E-10	-	-
75 Rhenium-186	D, see ¹⁷⁷ Re	2E+3	3E+3	1E-6	4E-9	3E-5	3E-4
	W, see ¹⁷⁷ Re	-	2E+3	7E-7	2E-9	-	-
75 Rhenium-187	D, see ¹⁷⁷ Re	6E+5	8E+5	4E-4	-	8E-3	8E-2
		-	St. wall (9E+5)	-	1E-6	-	-

	W, see ¹⁷⁷ Re	-	1E+5	4E-5	1E-7	-	-
75 Rhenium-188m ²	D, see ¹⁷⁷ Re	8E+4	1E+5	6E-5	2E-7	1E-3	1E-2
	W, see ¹⁷⁷ Re	-	1E+5	6E-5	2E-7	-	-
75 Rhenium-188	D, see ¹⁷⁷ Re	2E+3	3E+3	1E-6	4E-9	2E-5	2E-4
	W, see ¹⁷⁷ Re	-	3E+3	1E-6	4E-9	-	-
75 Rhenium-189	D, see ¹⁷⁷ Re	3E+3	5E+3	2E-6	7E-9	4E-5	4E-4
	W, see ¹⁷⁷ Re	-	4E+3	2E-6	6E-9	-	-
76 Osmium-180 ²	D, all compounds except those given for W and Y	1E+5	4E+5	2E-4	5E-7	1E-3	1E-2
	W, halides and nitrates	-	5E+5	2E-4	7E-7	-	-
	Y, oxides and hydroxides	-	5E+5	2E-4	6E-7	-	-
76 Osmium-181 ²	D, see ¹⁸⁰ Os	1E+4	4E+4	2E-5	6E-8	2E-4	2E-3
	W, see ¹⁸⁰ Os	-	5E+4	2E-5	6E-8	-	-
	Y, see ¹⁸⁰ Os	-	4E+4	2E-5	6E-8	-	-
76 Osmium-182D	see ¹⁸⁰ Os	2E+3	6E+3	2E-6	8E-9	3E-5	3E-4
	W, see ¹⁸⁰ Os	-	4E+3	2E-6	6E-9	-	-
	Y, see ¹⁸⁰ Os	-	4E+3	2E-6	6E-9	-	-
76 Osmium-185D	see ¹⁸⁰ Os	2E+3	5E+2	2E-7	7E-10	3E-5	3E-4
	W, see ¹⁸⁰ Os	-	8E+2	3E-7	1E-9	-	-
	Y, see ¹⁸⁰ Os	-	8E+2	3E-7	1E-9	-	-
76 Osmium-189mD	see ¹⁸⁰ Os	8E+4	2E+5	1E-4	3E-7	1E-3	1E-2
	W, see ¹⁸⁰ Os	-	2E+5	9E-5	3E-7	-	-
	Y, see ¹⁸⁰ Os	-	2E+5	7E-5	2E-7	-	-
76 Osmium-191mD	see ¹⁸⁰ Os	1E+4	3E+4	1E-5	4E-8	2E-4	2E-3
	W, see ¹⁸⁰ Os	-	2E+4	8E-6	3E-8	-	-
	Y, see ¹⁸⁰ Os	-	2E+4	7E-6	2E-8	-	-
76 Osmium-191D	see ¹⁸⁰ Os	2E+3	2E+3	9E-7	3E-9	-	-
	LLI wall (3E+3)	-	-	-	-	3E-5	3E-4
	W, see ¹⁸⁰ Os	-	2E+3	7E-7	2E-9	-	-
	Y, see ¹⁸⁰ Os	-	1E+3	6E-7	2E-9	-	-
76 Osmium-193D	see ¹⁸⁰ Os	2E+3	5E+3	2E-6	6E-9	-	-

	LLI wall (2E+3)	-	-	-	2E-5	2E-4
W, see ¹⁸⁰ Os	-	3E+3	1E-6	4E-9	-	-
Y, see ¹⁸⁰ Os	-	3E+3	1E-6	4E-9	-	-
76 Osmium-194D, see ¹⁸⁰ Os	4E+2	4E+1	2E-8	6E-11	-	-
	LLI wall (6E+2)	-	-	-	8E-6	8E-5
W, see ¹⁸⁰ Os	-	6E+1	2E-8	8E-11	-	-
Y, see ¹⁸⁰ Os	-	8E+0	3E-9	1E-11	-	-
77 Iridium-182 ² D, all compounds except those given for W and Y	4E+4	1E+5	6E-5	2E-7	-	-
	St. wall (4E+4)	-	-	-	6E-4	6E-3
W, halides, nitrates, and metallic iridium	-	2E+5	6E-5	2E-7	-	-
Y, oxides and hydroxides	-	1E+5	5E-5	2E-7	-	-
77 Iridium-184 D, see ¹⁸² Ir	8E+3	2E+4	1E-5	3E-8	1E-4	1E-3
W, see ¹⁸² Ir	-	3E+4	1E-5	5E-8	-	-
Y, see ¹⁸² Ir	-	3E+4	1E-5	4E-8	-	-
77 Iridium-185 D, see ¹⁸² Ir	5E+3	1E+4	5E-6	2E-8	7E-5	7E-4
W, see ¹⁸² Ir	-	1E+4	5E-6	2E-8	-	-
Y, see ¹⁸² Ir	-	1E+4	4E-6	1E-8	-	-
77 Iridium-186 D, see ¹⁸² Ir	2E+3	8E+3	3E-6	1E-8	3E-5	3E-4
W, see ¹⁸² Ir	-	6E+3	3E-6	9E-9	-	-
Y, see ¹⁸² Ir	-	6E+3	2E-6	8E-9	-	-
77 Iridium-187 D, see ¹⁸² Ir	1E+4	3E+4	1E-5	5E-8	1E-4	1E-3
W, see ¹⁸² Ir	-	3E+4	1E-5	4E-8	-	-
Y, see ¹⁸² Ir	-	3E+4	1E-5	4E-8	-	-
77 Iridium-188 D, see ¹⁸² Ir	2E+3	5E+3	2E-6	6E-9	3E-5	3E-4
W, see ¹⁸² Ir	-	4E+3	1E-6	5E-9	-	-
Y, see ¹⁸² Ir	-	3E+3	1E-6	5E-9	-	-
77 Iridium-189 D, see ¹⁸² Ir	5E+3	5E+3	2E-6	7E-9	-	-
	LLI wall (5E+3)	-	-	-	7E-5	7E-4
W, see ¹⁸² Ir	-	4E+3	2E-6	5E-9	-	-
Y, see ¹⁸² Ir	-	4E+3	1E-6	5E-9	-	-

77 Iridium-190m ² D, see ¹⁸² Ir	2E+5	2E+5	8E-5	3E-7	2E-3	2E-2
W, see ¹⁸² Ir	-	2E+5	9E-5	3E-7	-	-
Y, see ¹⁸² Ir	-	2E+5	8E-5	3E-7	-	-
77 Iridium-190 D, see ¹⁸² Ir	1E+3	9E+2	4E-7	1E-9	1E-5	1E-4
W, see ¹⁸² Ir	-	1E+3	4E-7	1E-9	-	-
Y, see ¹⁸² Ir	-	9E+2	4E-7	1E-9	-	-
77 Iridium-192m D, see ¹⁸² Ir	3E+3	9E+1	4E-8	1E-10	4E-5	4E-4
W, see ¹⁸² Ir	-	2E+2	9E-8	3E-10	-	-
Y, see ¹⁸² Ir	-	2E+1	6E-9	2E-11	-	-
77 Iridium-192 D, see ¹⁸² Ir	9E+2	3E+2	1E-7	4E-10	1E-5	1E-4
W, see ¹⁸² Ir	-	4E+2	2E-7	6E-10	-	-
Y, see ¹⁸² Ir	-	2E+2	9E-8	3E-10	-	-
77 Iridium-194m D, see ¹⁸² Ir	6E+2	9E+1	4E-8	1E-10	9E-6	9E-5
W, see ¹⁸² Ir	-	2E+2	7E-8	2E-10	-	-
Y, see ¹⁸² Ir	-	1E+2	4E-8	1E-10	-	-
77 Iridium-194 D, see ¹⁸² Ir	1E+3	3E+3	1E-6	4E-9	1E-5	1E-4
W, see ¹⁸² Ir	-	2E+3	9E-7	3E-9	-	-
Y, see ¹⁸² Ir	-	2E+3	8E-7	3E-9	-	-
77 Iridium-195m D, see ¹⁸² Ir	8E+3	2E+4	1E-5	3E-8	1E-4	1E-3
W, see ¹⁸² Ir	-	3E+4	1E-5	4E-8	-	-
Y, see ¹⁸² Ir	-	2E+4	9E-6	3E-8	-	-
77 Iridium-195 D, see ¹⁸² Ir	1E+4	4E+4	2E-5	6E-8	2E-4	2E-3
W, see ¹⁸² Ir	-	5E+4	2E-5	7E-8	-	-
Y, see ¹⁸² Ir	-	4E+4	2E-5	6E-8	-	-
78 Platinum-186 D, all compounds	1E+4	4E+4	2E-5	5E-8	2E-4	2E-3
78 Platinum-188 D, all compounds	2E+3	2E+3	7E-7	2E-9	2E-5	2E-4
78 Platinum-189 D, all compounds	1E+4	3E+4	1E-5	4E-8	1E-4	1E-3
78 Platinum-191 D, all compounds	4E+3	8E+3	4E-6	1E-8	5E-5	5E-4
78 Platinum-193m D, all compounds	3E+3	6E+3	3E-6	8E-9	-	-
	LLI wall (3E+4)	-	-	-	4E-5	4E-4
78 Platinum-193 D, all compounds	4E+4	2E+4	1E-5	3E-8	-	-
	LLI wall (5E+4)	-	-	-	6E-4	6E-3
78 Platinum-195m D, all compounds	2E+3	4E+3	2E-6	6E-9	-	-
	LLI wall					

		(2E+3)	-	-	-	3E-5	3E-4
78 Platinum-197m ²	D, all compounds	2E+4	4E+4	2E-5	6E-8	2E-4	2E-3
78 Platinum-197	D, all compounds	3E+3	1E+4	4E-6	1E-8	4E-5	4E-4
78 Platinum-199 ²	D, all compounds	5E+4	1E+5	6E-5	2E-7	7E-4	7E-3
78 Platinum-200	D, all compounds	1E+3	3E+3	1E-6	5E-9	2E-5	2E-4
79 Gold-193	D, all compounds except those given for W and Y	9E+3	3E+4	1E-5	4E-8	1E-4	1E-3
	W, halides and nitrates	-	2E+4	9E-6	3E-8	-	-
	Y, oxides and hydroxides	-	2E+4	8E-6	3E-8	-	-
79 Gold-194	D, see ¹⁹³ Au	3E+3	8E+3	3E-6	1E-8	4E-5	4E-4
	W, see ¹⁹³ Au	-	5E+3	2E-6	8E-9	-	-
	Y, see ¹⁹³ Au	-	5E+3	2E-6	7E-9	-	-
79 Gold-195	D, see ¹⁹³ Au	5E+3	1E+4	5E-6	2E-8	7E-5	7E-4
	W, see ¹⁹³ Au	-	1E+3	6E-7	2E-9	-	-
	Y, see ¹⁹³ Au	-	4E+2	2E-7	6E-10	-	-
79 Gold-198m	D, see ¹⁹³ Au	1E+3	3E+3	1E-6	4E-9	1E-5	1E-4
	W, see ¹⁹³ Au	-	1E+3	5E-7	2E-9	-	-
	Y, see ¹⁹³ Au	-	1E+3	5E-7	2E-9	-	-
79 Gold-198	D, see ¹⁹³ Au	1E+3	4E+3	2E-6	5E-9	2E-5	2E-4
	W, see ¹⁹³ Au	-	2E+3	8E-7	3E-9	-	-
	Y, see ¹⁹³ Au	-	2E+3	7E-7	2E-9	-	-
79 Gold-199	D, see ¹⁹³ Au	3E+3	9E+3	4E-6	1E-8	-	-
	LLI wall (3E+3)	(3E+3)	-	-	-	4E-5	4E-4
	W, see ¹⁹³ Au	-	4E+3	2E-6	6E-9	-	-
	Y, see ¹⁹³ Au	-	4E+3	2E-6	5E-9	-	-
79 Gold-200m	D, see ¹⁹³ Au	1E+3	4E+3	1E-6	5E-9	2E-5	2E-4
	W, see ¹⁹³ Au	-	3E+3	1E-6	4E-9	-	-
	Y, see ¹⁹³ Au	-	2E+4	1E-6	3E-9	-	-
79 Gold-200 ²	D, see ¹⁹³ Au	3E+4	6E+4	3E-5	9E-8	4E-4	4E-3

	W, see ¹⁹³ Au	-	8E+4	3E-5	1E-7	-	-
	Y, see ¹⁹³ Au	-	7E+4	3E-5	1E-7	-	-
79 Gold-201 ²	D, see ¹⁹³ Au	7E+4	2E+5	9E-5	3E-7	-	-
	St. wall (9E+4)	-	-	-	-	1E-3	1E-2
	W, see ¹⁹³ Au	-	2E+5	1E-4	3E-7	-	-
	Y, see ¹⁹³ Au	-	2E+5	9E-5	3E-7	-	-
80 Mercury-193m	Vapor	-	8E+3	4E-6	1E-8	-	-
	Organic D	4E+3	1E+4	5E-6	2E-8	6E-5	6E-4
	D, sulfates	3E+3	9E+3	4E-6	1E-8	4E-5	4E-4
	W, oxides, hydroxides, halides, nitrates, and sulfides	-	8E+3	3E-6	1E-8	-	-
80 Mercury-193	Vapor	-	3E+4	1E-5	4E-8	-	-
	Organic D	2E+4	6E+4	3E-5	9E-8	3E-4	3E-3
	D, see ^{193m} Hg	2E+4	4E+4	2E-5	6E-8	2E-4	2E-3
	W, see ^{193m} Hg	-	4E+4	2E-5	6E-8	-	-
80 Mercury-194	Vapor	-	3E+1	1E-8	4E-11	-	-
	Organic D	2E+1	3E+1	1E-8	4E-11	2E-7	2E-6
	D, see ^{193m} Hg	8E+2	4E+1	2E-8	6E-11	1E-5	1E-4
	W, see ^{193m} Hg	-	1E+2	5E-8	2E-10	-	-
80 Mercury-195m	Vapor	-	4E+3	2E-6	6E-9	-	-
	Organic D	3E+3	6E+3	3E-6	8E-9	4E-5	4E-4
	D, see ^{193m} Hg	2E+3	5E+3	2E-6	7E-9	3E-5	3E-4
	W, see ^{193m} Hg	-	4E+3	2E-6	5E-9	-	-
80 Mercury-195	Vapor	-	3E+4	1E-5	4E-8	-	-
	Organic D	2E+4	5E+4	2E-5	6E-8	2E-4	2E-3
	D, see ^{193m} Hg	1E+4	4E+4	1E-5	5E-8	2E-4	2E-3
	W, see ^{193m} Hg	-	3E+4	1E-5	5E-8	-	-
80 Mercury-197m	Vapor	-	5E+3	2E-6	7E-9	-	-
	Organic D	4E+3	9E+3	4E-6	1E-8	5E-5	5E-4

	D, see ^{193m} Hg	3E+3	7E+3	3E-6	1E-8	4E-5	4E-4
	W, see ^{193m} Hg	-	5E+3	2E-6	7E-9	-	-
80 Mercury-197	Vapor	-	8E+3	4E-6	1E-8	-	-
	Organic D	7E+3	1E+4	6E-6	2E-8	9E-5	9E-4
	D, see ^{193m} Hg	6E+3	1E+4	5E-6	2E-8	8E-5	8E-4
	W, see ^{193m} Hg	-	9E+3	4E-6	1E-8	-	-
80 Mercury-199m ²	Vapor	-	8E+4	3E-5	1E-7	-	-
	Organic D	6E+4	2E+5	7E-5	2E-7	-	-
	St. wall (1E+5)	-	-	-	-	1E-3	1E-2
	D, see ^{193m} Hg	6E+4	1E+5	6E-5	2E-7	8E-4	8E-3
	W, see ^{193m} Hg	-	2E+5	7E-5	2E-7	-	-
80 Mercury-203	Vapor	-	8E+2	4E-7	1E-9	-	-
	Organic D	5E+2	8E+2	3E-7	1E-9	7E-6	7E-5
	D, see ^{193m} Hg	2E+3	1E+3	5E-7	2E-9	3E-5	3E-4
	W, see ^{193m} Hg	-	1E+3	5E-7	2E-9	-	-
81 Thallium-194m ²	D, all compounds	5E+4	2E+5	6E-5	2E-7	-	-
	St. wall (7E+4)	-	-	-	-	1E-3	1E-2
81 Thallium-194 ²	D, all compounds	3E+5	6E+5	2E-4	8E-7	-	-
	St. wall (3E+5)	-	-	-	-	4E-3	4E-2
81 Thallium-195 ²	D, all compounds	6E+4	1E+5	5E-5	2E-7	9E-4	9E-3
81 Thallium-197	D, all compounds	7E+4	1E+5	5E-5	2E-7	1E-3	1E-2
81 Thallium-198m ²	D, all compounds	3E+4	5E+4	2E-5	8E-8	4E-4	4E-3
81 Thallium-198	D, all compounds	2E+4	3E+4	1E-5	5E-8	3E-4	3E-3
81 Thallium-199	D, all compounds	6E+4	8E+4	4E-5	1E-7	9E-4	9E-3
81 Thallium-200	D, all compounds	8E+3	1E+4	5E-6	2E-8	1E-4	1E-3
81 Thallium-201	D, all compounds	2E+4	2E+4	9E-6	3E-8	2E-4	2E-3
81 Thallium-202	D, all compounds	4E+3	5E+3	2E-6	7E-9	5E-5	5E-4

81 Thallium-204	D, all compounds	2E+3	2E+3	9E-7	3E-9	2E-5	2E-4
82 Lead-195m ²	D, all compounds	6E+4	2E+5	8E-5	3E-7	8E-4	8E-3
82 Lead-198	D, all compounds	3E+4	6E+4	3E-5	9E-8	4E-4	4E-3
82 Lead-199 ²	D, all compounds	2E+4	7E+4	3E-5	1E-7	3E-4	3E-3
82 Lead-200	D, all compounds	3E+3	6E+3	3E-6	9E-9	4E-5	4E-4
82 Lead-201	D, all compounds	7E+3	2E+4	8E-6	3E-8	1E-4	1E-3
82 Lead-202m	D, all compounds	9E+3	3E+4	1E-5	4E-8	1E-4	1E-3
82 Lead-202	D, all compounds	1E+2	5E+1	2E-8	7E-11	2E-6	2E-5
82 Lead-203	D, all compounds	5E+3	9E+3	4E-6	1E-8	7E-5	7E-4
82 Lead-205	D, all compounds	4E+3	1E+3	6E-7	2E-9	5E-5	5E-4
82 Lead-209	D, all compounds	2E+4	6E+4	2E-5	8E-8	3E-4	3E-3
82 Lead-210	D, all compounds	6E-1 Bone surf (1E+0)	2E-1 Bone surf (4E-1)	1E-10	-	-	-
82 Lead-211 ²	D, all compounds	1E+4	6E+2	3E-7	9E-10	2E-4	2E-3
82 Lead-212	D, all compounds	8E+1 Bone surf (1E+2)	3E+1	1E-8	5E-11	-	-
82 Lead-214 ²	D, all compounds	9E+3	8E+2	3E-7	1E-9	1E-4	1E-3
83 Bismuth-200 ²	D, nitrates W, all other compounds	3E+4	8E+4	4E-5	1E-7	4E-4	4E-3
		-	1E+5	4E-5	1E-7	-	-
83 Bismuth-201 ²	D, see ²⁰⁰ Bi W, see ²⁰⁰ Bi	1E+4	3E+4	1E-5	4E-8	2E-4	2E-3
		-	4E+4	2E-5	5E-8	-	-
83 Bismuth-202 ²	D, see ²⁰⁰ Bi W, see ²⁰⁰ Bi	1E+4	4E+4	2E-5	6E-8	2E-4	2E-3
		-	8E+4	3E-5	1E-7	-	-
83 Bismuth-203	D, see ²⁰⁰ Bi W, see ²⁰⁰ Bi	2E+3	7E+3	3E-6	9E-9	3E-5	3E-4
		-	6E+3	3E-6	9E-9	-	-
83 Bismuth-205	D, see ²⁰⁰ Bi	1E+3	3E+3	1E-6	3E-9	2E-5	2E-4

	W, see ²⁰⁰ Bi	-	1E+3	5E-7	2E-9	-	-
83 Bismuth-206	D, see ²⁰⁰ Bi	6E+2	1E+3	6E-7	2E-9	9E-6	9E-5
	W, see ²⁰⁰ Bi	-	9E+2	4E-7	1E-9	-	-
83 Bismuth-207	D, see ²⁰⁰ Bi	1E+3	2E+3	7E-7	2E-9	1E-5	1E-4
	W, see ²⁰⁰ Bi	-	4E+2	1E-7	5E-10	-	-
83 Bismuth-210m	D, see ²⁰⁰ Bi	4E+1 Kidneys (6E+1)	5E+0 Kidneys (6E+0)	2E-9	-	-	-
	W, see ²⁰⁰ Bi	-	7E-1	3E-10	9E-12	8E-7	8E-6
83 Bismuth-210	D, see ²⁰⁰ Bi	8E+2	2E+2 Kidneys (4E+2)	1E-7	-	1E-5	1E-4
	W, see ²⁰⁰ Bi	-	3E+1	1E-8	4E-11	-	-
83 Bismuth-212 ²	D, see ²⁰⁰ Bi	5E+3	2E+2	1E-7	3E-10	7E-5	7E-4
	W, see ²⁰⁰ Bi	-	3E+2	1E-7	4E-10	-	-
83 Bismuth-213 ²	D, see ²⁰⁰ Bi	7E+3	3E+2	1E-7	4E-10	1E-4	1E-3
	W, see ²⁰⁰ Bi	-	4E+2	1E-7	5E-10	-	-
83 Bismuth-214 ²	D, see ²⁰⁰ Bi	2E+4 St. wall (2E+4)	8E+2	3E-7	1E-9	-	-
	W, see ²⁰⁰ Bi	-	9E-2	4E-7	1E-9	3E-4	3E-3
84 Polonium-203 ²	D, all compounds except those given for W	3E+4	6E+4	3E-5	9E-8	3E-4	3E-3
	W, oxides, hydroxides, and nitrates	-	9E+4	4E-5	1E-7	-	-
84 Polonium-205 ²	D, see ²⁰³ Po	2E+4	4E+4	2E-5	5E-8	3E-4	3E-3
	W, see ²⁰³ Po	-	7E+4	3E-5	1E-7	-	-
84 Polonium-207	D, see ²⁰³ Po	8E+3	3E+4	1E-5	3E-8	1E-4	1E-3
	W, see ²⁰³ Po	-	3E+4	1E-5	4E-8	-	-
84 Polonium-210	D, see ²⁰³ Po	3E+0	6E-1	3E-10	9E-13	4E-8	4E-7
	W, see ²⁰³ Po	-	6E-1	3E-10	9E-13	-	-
85 Astatine-207 ²	D, halides	6E+3	3E+3	1E-6	4E-9	8E-5	8E-4
	W	-	2E+3	9E-7	3E-9	-	-

85 Astatine-211	D, halides W	1E+2 -	8E+1 5E+1	3E-8 2E-8	1E-10 8E-11	2E-6 -	2E-5 -
86 Radon-220	With daughters removed	-	2E+4	7E-6	2E-8	-	-
	With daughters present	-	2E+1 (or 12 working level months)	9E-9 (or 1.0 working level)	3E-11	-	-
86 Radon-222	With daughters removed	-	1E+4	4E-6	1E-8	-	-
	With daughters present	-	1E+2 (or 4 working level months)	3E-8 (or 0.33 working level)	1E-10	-	-
87 Francium-222 ²	D, all compounds	2E+3	5E+2	2E-7	6E-10	3E-5	3E-4
87 Francium-223 ²	D, all compounds	6E+2	8E+2	3E-7	1E-9	8E-6	8E-5
88 Radium-223	W, all compounds	5E+0 Bone surf (9E+0)	7E-1 -	3E-10 -	9E-13 -	- 1E-7	- 1E-6
88 Radium-224	W, all compounds	8E+0 Bone surf (2E+1)	2E+0 -	7E-10 -	2E-12 -	- 2E-7	- 2E-6
88 Radium-225	W, all compounds	8E+0 Bone surf (2E+1)	7E-1 -	3E-10 -	9E-13 -	- 2E-7	- 2E-6
88 Radium-226	W, all compounds	2E+0 Bone surf (5E+0)	6E-1 -	3E-10 -	9E-13 -	- 6E-8	- 6E-7
88 Radium-227 ²	W, all compounds	2E+4 Bone surf	1E+4 Bone surf	6E-6	-	-	-

		(2E+4)	(2E+4)	-	3E-8	3E-4	3E-3
88 Radium-228	W, all compounds	2E+0 Bone surf (4E+0)	1E+0	5E-10	2E-12	-	-
			-	-	-	6E-8	6E-7
89 Actinium-224	D, all compounds except those given for W and Y	2E+3 LLI wall (2E+3)	3E+1 Bone surf (4E+1)	1E-8	-	-	-
	W, halides and nitrates	-	5E+1	2E-8	7E-11	-	-
	Y, oxides and hydroxides	-	5E+1	2E-8	6E-11	-	-
89 Actinium-225	D, see ²²⁴ Ac	5E+1 LLI wall (5E+1)	3E-1 Bone surf (5E-1)	1E-10	-	-	-
	W, see ²²⁴ Ac	-	6E-1	3E-10	9E-13	-	-
	Y, see ²²⁴ Ac	-	6E-1	3E-10	9E-13	-	-
89 Actinium-226	D, see ²²⁴ Ac	1E+2 LLI wall (1E+2)	3E+0 Bone surf (4E+0)	1E-9	-	-	-
	W, see ²²⁴ Ac	-	5E+0	2E-9	7E-12	-	-
	Y, see ²²⁴ Ac	-	5E+0	2E-9	6E-12	-	-
89 Actinium-227	D, see ²²⁴ Ac	2E-1 Bone surf (4E-1)	4E-4 Bone surf (8E-4)	2E-13	-	-	-
	W, see ²²⁴ Ac	-	2E-3 Bone surf (3E-3)	7E-13	-	-	-
	Y, see ²²⁴ Ac	-	4E-3	2E-12	4E-15 6E-15	-	-
89 Actinium-228	D, see ²²⁴ Ac	2E+3	9E+0 Bone	4E-9	-	3E-5	3E-4

		-	surf (2E+1)	-	2E-11	-	-
	W, see ²²⁴ Ac	-	4E+1 Bone surf (6E+1)	2E-8	-	-	-
	Y, see ²²⁴ Ac	-	4E+1	2E-8	6E-11	-	-
90 Thorium-226 ²	W, all compounds except those given for Y	5E+3 St. wall (5E+3)	2E+2	6E-8	2E-10	-	-
	Y, oxides and hydroxides	-	1E+2	6E-8	2E-10	-	7E-5 7E-4
90 Thorium-227	W, see ²²⁶ Th Y, see ²²⁶ Th	1E+2 -	3E-1 3E-1	1E-10 1E-10	5E-13 5E-13	2E-6 -	2E-5 -
90 Thorium-228	W, see ²²⁶ Th	6E+0 Bone surf (1E+1)	1E-2 Bone surf (2E-2)	4E-12	-	-	-
	Y, see ²²⁶ Th	-	2E-2	7E-12	2E-14	-	-
90 Thorium-229	W, see ²²⁶ Th	6E-1 Bone surf (1E+0)	9E-4 Bone surf (2E-3)	4E-13	-	-	-
	Y, see ²²⁶ Th	-	2E-3 Bone surf (3E-3)	1E-12	-	-	-
		-			4E-15	-	-
90 Thorium-230	W, see ²²⁶ Th	4E+0 Bone surf (9E+0)	6E-3 Bone surf (2E-2)	3E-12	-	-	-
	Y, see ²²⁶ Th	-	2E-2 Bone surf (2E-2)	6E-12	-	-	-
		-			3E-14	-	-
90 Thorium-231	W, see ²²⁶ Th	4E+3	6E+3	3E-6	9E-9	5E-5	5E-4

	Y, see ²²⁶ Th	-	6E+3	3E-6	9E-9	-	-
90 Thorium-232	W, see ²²⁶ Th	7E-1 Bone surf (2E+0)	1E-3 Bone surf (3E-3)	5E-13	-	-	-
				-	4E-15	3E-8	3E-7
	Y, see ²²⁶ Th	-	3E-3 Bone surf (4E-3)	1E-12	-	-	-
		-		-	6E-15	-	-
90 Thorium-234	W, see ²²⁶ Th	3E+2 LLI wall (4E+2)	2E+2	8E-8	3E-10	-	-
			-	-	-	5E-6	5E-5
	Y, see ²²⁶ Th	-	2E+2	6E-8	2E-10	-	-
91 Protactinium-227 ²	W, all compounds except those given for Y	4E+3	1E+2	5E-8	2E-10	5E-5	5E-4
	Y, oxides and hydroxides	-	1E+2	4E-8	1E-10	-	-
91 Protactinium-228	W, see ²²⁷ Pa	1E+3	1E+1 Bone surf (2E+1)	5E-9	-	2E-5	2E-4
		-		-	3E-11	-	-
	Y, see ²²⁶ Pa	-	1E+1	5E-9	2E-11	-	-
91 Protactinium-230	W, see ²²⁷ Pa	6E+2 Bone surf (9E+2)	5E+0	2E-9	7E-12	-	-
			-	-	-	1E-5	1E-4
	Y, see ²²⁷ Pa	-	4E+0	1E-9	5E-12	-	-
91 Protactinium-231	W, see ²²⁷ Pa	2E-1 Bone surf (5E-1)	2E-3 Bone surf (4E-3)	6E-13	-	-	-
				-	6E-15	6E-9	6E-8
	Y, see ²²⁶ Pa	-	4E-3 Bone surf (6E-3)	2E-12	-	-	-
		-		-	8E-15	-	-
91 Protactinium-232	W, see ²²⁷ Pa	1E+3	2E+1	9E-9	-	2E-5	2E-4

			Bone surf (6E+1)	-	8E-11	-	-
	Y, see ²²⁷ Pa	-	6E+1	2E-8	-	-	-
		-	Bone surf (7E+1)	-	1E-10	-	-
91 Protactinium-233	W, see ²²⁷ Pa	1E+3 LLI wall (2E+3)	7E+2	3E-7	1E-9	-	-
		-	-	-	-	2E-5	2E-4
	Y, see ²²⁷ Pa	-	6E+2	2E-7	8E-10	-	-
91 Protactinium-234	W, see ²²⁷ Pa	2E+3	8E+3	3E-6	1E-8	3E-5	3E-4
	Y, see ²²⁷ Pa	-	7E+3	3E-6	9E-9	-	-
92 Uranium-230	D, UF ₆ , UO ₂ F ₂ , UO ₂ (NO ₃) ₂	4E+0 Bone surf (6E+0)	4E-1 Bone surf (6E-1)	2E-10	-	-	-
		-	-	-	8E-13	8E-8	8E-7
	W, UO ₃ , UF ₄ , UCl ₄	-	4E-1	1E-10	5E-13	-	-
	Y, UO ₂ , U ₃ O ₈	-	3E-1	1E-10	4E-13	-	-
92 Uranium-231	D, see ²³⁰ U	5E+3 LLI wall (4E+3)	8E+3	3E-6	1E-8	-	-
		-	-	-	-	6E-5	6E-4
	W, see ²³⁰ U	-	6E+3	2E-6	8E-9	-	-
	Y, see ²³⁰ U	-	5E+3	2E-6	6E-9	-	-
92 Uranium-232	D, see ²³⁰ U	2E+0 Bone surf (4E+0)	2E-1 Bone surf (4E-1)	9E-11	-	-	-
		-	-	-	6E-13	6E-8	6E-7
	W, see ²³⁰ U	-	4E-1	2E-10	5E-13	-	-
	Y, see ²³⁰ U	-	8E-3	3E-12	1E-14	-	-
92 Uranium-233	D, see ²³⁰ U	1E+1 Bone surf (2E+1)	1E+0 Bone surf (2E+0)	5E-10	-	-	-
		-	-	-	3E-12	3E-7	3E-6

	W, see ^{230}U	-	7E-1	3E-10	1E-12	-	-
	Y, see ^{230}U	-	4E-2	2E-11	5E-14	-	-
92 Uranium-234 ³	D, see ^{230}U	1E+1 Bone surf (2E+1)	1E+0 Bone surf (2E+0)	5E-10	-	-	-
	W, see ^{230}U	-	7E-1	3E-10	1E-12	-	-
	Y, see ^{230}U	-	4E-2	2E-11	5E-1	-	-
92 Uranium-235 ³	D, see ^{230}U	1E+1 Bone surf (2E+1)	1E+0 Bone surf (2E+0)	6E-10	-	-	-
	W, see ^{230}U	-	8E-1	3E-10	1E-12	-	-
	Y, see ^{230}U	-	4E-2	2E-11	6E-14	-	-
92 Uranium-236	D, see ^{230}U	1E+1 Bone surf (2E+1)	1E+0 Bone surf (2E+0)	5E-10	-	-	-
	W, see ^{230}U	-	8E-1	3E-10	1E-12	-	-
	Y, see ^{230}U	-	4E-2	2E-11	6E-14	-	-
92 Uranium-237	D, see ^{230}U	2E+3 LLI wall (2E+3)	3E+3	1E-6	4E-9	-	-
	W, see ^{230}U	-	2E+3	7E-7	2E-9	-	-
	Y, see ^{230}U	-	2E+3	6E-7	2E-9	-	-
92 Uranium-238 ³	D, see ^{230}U	1E+1 Bone surf (2E+1)	1E+0 Bone surf (2E+0)	6E-10	-	-	-
	W, see ^{230}U	-	8E-1	3E-10	1E-12	-	-
	Y, see ^{230}U	-	4E-2	2E-11	6E-14	-	-
92 Uranium-239 ²	D, see ^{230}U	7E+4	2E+5	8E-5	3E-7	9E-4	9E-3
	W, see ^{230}U	-	2E+5	7E-5	2E-7	-	-

	Y, see ²³⁰ U	-	2E+5	6E-5	2E-7	-	-
92 Uranium-240	D, see ²³⁰ U	1E+3	4E+3	2E-6	5E-9	2E-5	2E-4
	W, see ²³⁰ U	-	3E+3	1E-6	4E-9	-	-
	Y, see ²³⁰ U	-	2E+3	1E-6	3E-9	-	-
92 Uranium-natural ³	D, see ²³⁰ U	1E+1	1E+0	5E-10	-	-	-
		Bone surf (2E+1)	Bone surf (2E+0)	-	3E-12	3E-7	3E-6
	W, see ²³⁰ U	-	8E-1	3E-10	9E-13	-	-
	Y, see ²³⁰ U	-	5E-2	2E-11	9E-14	-	-
93 Neptunium-232 ²	W, all compounds	1E+5	2E+3	7E-7	-	2E-3	2E-2
		-	Bone surf (5E+2)	-	6E-9	-	-
93 Neptunium-233 ²	W, all compounds	8E+5	3E+6	1E-3	4E-6	1E-2	1E-1
93 Neptunium-234	W, all compounds	2E+3	3E+3	1E-6	4E-9	3E-5	3E-4
93 Neptunium-235	W, all compounds	2E+4	8E+2	3E-7	-	-	-
		LLI wall (2E+4)	Bone surf (1E+3)	-	2E-9	3E-4	3E-3
93 Neptunium-236 (1.15E+5y)	W, all compounds	3E+0	2E-2	9E-12	-	-	-
		Bone surf (6E+0)	Bone surf (5E-2)	-	8E-14	9E-8	9E-7
93 Neptunium-236 (22.5h)	W, all compounds	3E+3	3E+1	1E-8	-	-	-
		Bone surf (4E+3)	Bone surf (7E+1)	-	1E-10	5E-5	5E-4
93 Neptunium-237	W, all compounds	5E-1	4E-3	2E-12	-	-	-
		Bone surf (1E+0)	Bone surf (1E-2)	-	1E-14	2E-8	2E-7
93 Neptunium-238	W, all compounds	1E+3	6E+1	3E-8	-	2E-5	2E-4
		-	Bone surf (2E+2)	-	2E-10	-	-

93 Neptunium-239	W, all compounds	2E+3 LLI wall (2E+3)	2E+3	9E-7	3E-9	-	-
			-	-	-	2E-5	2E-4
93 Neptunium-240 ²	W, all compounds	2E+4	8E+4	3E-5	1E-7	3E-4	3E-3
94 Plutonium-234	W, all compounds except PuO ₂	8E+3	2E+2	9E-8	3E-10	1E-4	1E-3
	Y, PuO ₂	-	2E+2	8E-8	3E-10	-	-
94 Plutonium-235 ²	W, see ²³⁴ Pu	9E+5	3E+6	1E-3	4E-6	1E-2	1E-1
	Y, see ²³⁴ Pu	-	3E+6	1E-3	3E-6	-	-
94 Plutonium-236	W, see ²³⁴ Pu	2E+0 Bone surf (4E+0)	2E-2 Bone surf (4E-2)	8E-12	-	-	-
			-	5E-14	6E-8		6E-7
	Y, see ²³⁴ Pu	-	4E-2	2E-11	6E-14	-	-
94 Plutonium-237	W, see ²³⁴ Pu	1E+4	3E+3	1E-6	5E-9	2E-4	2E-3
	Y, see ²³⁴ Pu	-	3E+3	1E-6	4E-9	-	-
94 Plutonium-238	W, see ²³⁴ Pu	9E-1 Bone surf (2E+0)	7E-3 Bone surf (1E-2)	3E-12	-	-	-
			-	2E-14	2E-8		2E-7
	Y, see ²³⁴ Pu	-	2E-2	8E-12	2E-14	-	-
94 Plutonium-239	W, see ²³⁴ Pu	8E-1 Bone surf (1E+0)	6E-3 Bone surf (1E-2)	3E-12	-	-	-
			-	2E-14	2E-8		2E-7
	Y, see ²³⁴ Pu	-	2E-2 Bone surf	7E-12	-	-	-
		-	(2E-2)	-	2E-14	-	-
94 Plutonium-240	W, see ²³⁴ Pu	8E-1 Bone surf (1E+0)	6E-3 Bone surf (1E-2)	3E-12	-	-	-
			-	2E-14	2E-8		2E-7
	Y, see ²³⁴ Pu	-	2E-2 Bone surf	7E-12	-	-	-
		-	(2E-2)	-	2E-14	-	-

94 Plutonium-241	W, see ²³⁴ Pu	4E+1 Bone surf (7E+1)	3E-1 Bone surf (6E-1)	1E-10	-	-	-
	Y, see ²³⁴ Pu	-	8E-1 Bone surf (1E+0)	3E-10	-	8E-13 1E-6	1E-5
94 Plutonium-242	W, see ²³⁴ Pu	8E-1 Bone surf (1E+0)	7E-3 Bone surf (1E-2)	3E-12	-	-	-
	Y, see ²³⁴ Pu	-	2E-2 Bone surf (2E-2)	7E-12	-	2E-14 2E-8	2E-7
94 Plutonium-243	W, see ²³⁴ Pu	2E+4	4E+4	2E-5	5E-8	2E-4	2E-3
	Y, see ²³⁴ Pu	-	4E+4	2E-5	5E-8	-	-
94 Plutonium-244	W, see ²³⁴ Pu	8E-1 Bone surf (2E+0)	7E-3 Bone surf (1E-2)	3E-12	-	-	-
	Y, see ²³⁴ Pu	-	2E-2 Bone surf (2E-2)	7E-12	-	2E-14 2E-8	2E-7
94 Plutonium-245	W, see ²³⁴ Pu	2E+3	5E+3	2E-6	6E-9	3E-5	3E-4
	Y, see ²³⁴ Pu	-	4E+3	2E-6	6E-9	-	-
94 Plutonium-246	W, see ²³⁴ Pu	4E+2 LLI wall (4E+2)	3E+2	1E-7	4E-10	-	-
	Y, see ²³⁴ Pu	-	3E+2	1E-7	4E-10	6E-6	6E-5
95 Americium-237 ²	W, all compounds	8E+4	3E+5	1E-4	4E-7	1E-3	1E-2
95 Americium-238 ²	W, all compounds	4E+4	3E+3 Bone surf	1E-6	-	5E-4	5E-3

	-	(6E+3)	-	9E-9	-	-
95 Americium-239 W, all compounds	5E+3	1E+4	5E-6	2E-8	7E-5	7E-4
95 Americium-240 W, all compounds	2E+3	3E+3	1E-6	4E-9	3E-5	3E-4
95 Americium-241 W, all compounds	8E-1 Bone surf (1E+0)	6E-3 Bone surf (1E-2)	3E-12	-	-	-
			-	2E-14	2E-8	2E-7
95 Americium-242m W, all compounds	8E-1 Bone surf (1E+0)	6E-3 Bone surf (1E-2)	3E-12	-	-	-
			-	2E-14	2E-8	2E-7
95 Americium-242 W, all compounds	4E+3	8E+1 Bone surf (9E+1)	4E-8	-	5E-5	5E-4
	-		-	1E-10	-	-
95 Americium-243 W, all compounds	8E-1 Bone surf (1E+0)	6E-3 Bone surf (1E-2)	3E-12	-	-	-
			-	2E-14	2E-8	2E-7
95 Americium-244m ² W, all compounds	6E+4 St. wall (8E+4)	4E+3 Bone surf (7E+3)	2E-6	-	-	-
			-	1E-8	1E-3	1E-2
95 Americium-244 W, all compounds	3E+3	2E+2 Bone surf (3E+2)	8E-8	-	4E-5	4E-4
	-		-	4E-10	-	-
95 Americium-245 W, all compounds	3E+4	8E+4	3E-5	1E-7	4E-4	4E-3
95 Americium-246m ² W, all compounds	5E+4 St. wall (6E+4)	2E+5	8E-5	3E-7	-	-
			-	-	8E-4	8E-3
95 Americium-246 ² W, all compounds	3E+4	1E+5	4E-5	1E-7	4E-4	4E-3
96 Curium-238 W, all compounds	2E+4	1E+3	5E-7	2E-9	2E-4	2E-3
96 Curium-240 W, all compounds	6E+1 Bone	6E-1 Bone	2E-10	-	-	-

	surf (8E+1)	surf (6E-1)	-	9E-13	1E-6	1E-5
96 Curium-241 W, all compounds	1E+3	3E+1 Bone surf	1E-8	-	2E-5	2E-4
	-	(4E+1)	-	5E-11	-	-
96 Curium-242 W, all compounds	3E+1 Bone surf	3E-1 Bone surf	1E-10	-	-	-
	(5E+1)	(3E-1)	-	4E-13	7E-7	7E-6
96 Curium-243 W, all compounds	1E+0 Bone surf	9E-3 Bone surf	4E-12	-	-	-
	(2E+0)	(2E-2)	-	2E-14	3E-8	3E-7
96 Curium-244 W, all compounds	1E+0 Bone surf	1E-2 Bone surf	5E-12	-	-	-
	(3E+0)	(2E-2)	-	3E-14	3E-8	3E-7
96 Curium-245 W, all compounds	7E-1 Bone surf	6E-3 Bone surf	3E-12	-	-	-
	(1E+0)	(1E-2)	-	2E-14	2E-8	2E-7
96 Curium-246 W, all compounds	7E-1 Bone surf	6E-3 Bone surf	3E-12	-	-	-
	(1E+0)	(1E-2)	-	2E-14	2E-8	2E-7
96 Curium-247 W, all compounds	8E-1 Bone surf	6E-3 Bone surf	3E-12	-	-	-
	(1E+0)	(1E-2)	-	2E-14	2E-8	2E-7
96 Curium-248 W, all compounds	2E-1 Bone surf	2E-3 Bone surf	7E-13	-	-	-
	(4E-1)	(3E-3)	-	4E-15	5E-9	5E-8
96 Curium-249 ² W, all compounds	5E+4	2E+4 Bone surf	7E-6	-	7E-4	7E-3
	-	(3E+4)	-	4E-8	-	-
96 Curium-250 W, all compounds	4E-2 Bone	3E-4 Bone	1E-13	-	-	-

		surf (6E-2)	surf (5E-4)	-	8E-16	9E-10	9E-9
97 Berkelium-245W, all compounds		2E+3	1E+3	5E-7	2E-9	3E-5	3E-4
97 Berkelium-246W, all compounds		3E+3	3E+3	1E-6	4E-9	4E-5	4E-4
97 Berkelium-247W, all compounds		5E-1	4E-3	2E-12	-	-	-
		Bone surf (1E+0)	Bone surf (9E-3)	-	1E-14	2E-8	2E-7
97 Berkelium-249W, all compounds		2E+2	2E+0	7E-10	-	-	-
		Bone surf (5E+2)	Bone surf (4E+0)	-	5E-12	6E-6	6E-5
97 Berkelium-250W, all compounds		9E+3	3E+2	1E-7	-	1E-4	1E-3
		-	Bone surf (7E+2)	-	1E-9	-	-
98 Californium-244 ²	W, all compounds except those given for Y	3E+4	6E+2	2E-7	8E-10	-	-
		St. wall (3E+4)	-	-	-	4E-4	4E-3
	Y, oxides and hydroxides	-	6E+2	2E-7	8E-10	-	-
98 Californium-246	W, see ²⁴⁴ Cf	4E+2	9E+0	4E-9	1E-11	5E-6	5E-5
	Y, see ²⁴⁴ Cf	-	9E+0	4E-9	1E-11	-	-
98 Californium-248	W, see ²⁴⁴ Cf	8E+0	6E-2	3E-11	-	-	-
		Bone surf (2E+1)	Bone surf (1E-1)	-	2E-13	2E-7	2E-6
	Y, see ²⁴⁴ Cf	-	1E-1	4E-11	1E-13	-	-
98 Californium-249	W, see ²⁴⁴ Cf	5E-1	4E-3	2E-12	-	-	-
		Bone surf (1E+0)	Bone surf (9E-3)	-	1E-14	2E-8	2E-7
	Y, see ²⁴⁴ Cf	-	1E-2	4E-12	-	-	-
		-	Bone surf (1E-2)	-	2E-14	-	-

98 Californium-250	W, see ²⁴⁴ Cf	1E+0 Bone surf (2E+0)	9E-3 Bone surf (2E-2)	4E-12	-	-	-
	Y, see ²⁴⁴ Cf	-	3E-2	1E-11	4E-14	3E-8	3E-7
98 Californium-251	W, see ²⁴⁴ Cf	5E-1 Bone surf (1E+0)	4E-3 Bone surf (9E-3)	2E-12	-	-	-
	Y, see ²⁴⁴ Cf	-	1E-2 Bone surf (1E-2)	4E-12	-	1E-14	2E-8
98 Californium-252	W, see ²⁴⁴ Cf	2E+0 Bone surf (5E+0)	2E-2 Bone surf (4E-2)	8E-12	-	-	-
	Y, see ²⁴⁴ Cf	-	3E-2	1E-11	5E-14	7E-8	7E-7
98 Californium-253	W, see ²⁴⁴ Cf	2E+2 Bone surf (4E+2)	2E+0	8E-10	3E-12	-	-
	Y, see ²⁴⁴ Cf	-	2E+0	7E-10	2E-12	5E-6	5E-5
98 Californium-254	W, see ²⁴⁴ Cf	2E+0	2E-2	9E-12	3E-14	3E-8	3E-7
	Y, see ²⁴⁴ Cf	-	2E-2	7E-12	2E-14	-	-
99 Einsteinium-250	W, all compounds	4E+4	5E+2 Bone surf (1E+3)	2E-7	-	6E-4	6E-3
		-			2E-9	-	-
99 Einsteinium-251	W, all compounds	7E+3	9E+2 Bone surf (1E+3)	4E-7	-	1E-4	1E-3
		-			2E-9	-	-
99 Einsteinium-253	W, all compounds	2E+2	1E+0	6E-10	2E-12	2E-6	2E-5
99 Einsteinium-254m	W, all compounds	3E+2 LLI wall (3E+2)	1E+1	4E-9	1E-11	-	-
						4E-6	4E-5

99 Einsteinium-254	W, all compounds	8E+0 Bone surf (2E+1)	7E-2 Bone surf (1E-1)	3E-11	-	-	-	2E-6
100 Fermium-252	W, all compounds	5E+2	1E+1	5E-9	2E-11	6E-6	6E-5	6E-5
100 Fermium-253	W, all compounds	1E+3	1E+1	4E-9	1E-11	1E-5	1E-4	1E-4
100 Fermium-254	W, all compounds	3E+3	9E+1	4E-8	1E-10	4E-5	4E-4	4E-4
100 Fermium-255	W, all compounds	5E+2	2E+1	9E-9	3E-11	7E-6	7E-5	7E-5
100 Fermium-257	W, all compounds	2E+1 Bone surf (4E+1)	2E-1 Bone surf (2E-1)	7E-11	-	-	-	5E-6
101 Mendeleevium-257	W, all compounds	7E+3	8E+1 Bone surf (9E+1)	4E-8	-	1E-4	1E-3	-
101 Mendeleevium-258	W, all compounds	3E+1 Bone surf (5E+1)	2E-1 Bone surf (3E-1)	1E-10	-	-	-	6E-6
Any single radionuclide not listed above with decay mode other than alpha emission or spontaneous fission and with radioactive half-life less than 2 hours Submersion ¹		-	2E+2	1E-7	1E-9	-	-	-
Any single radionuclide not listed above with decay mode other than alpha emission or spontaneous fission and with radioactive half-life greater than 2 hours. . . .		-	2E-1	1E-10	1E-12	1E-8	1E-7	1E-7
Any single radionuclide not listed above that decays by alpha emission or spontaneous fission, or any mixture for which either the identity or the concentration of any radionuclide in the mixture is not known. . . .		-	4E-4	2E-13	1E-15	2E-9	2E-8	2E-8

FOOTNOTES:

¹"Submersion" means that values given are for submersion in a hemispherical semi-infinite cloud of airborne material.

²These radionuclides have radiological half-lives of less than 2 hours. The total effective dose equivalent received during operations with these radionuclides might include a significant contribution from external exposure. The DAC values for all radionuclides, other than those designated Class "Submersion," are based upon the committed effective dose equivalent due to the intake of the radionuclide into the body and do NOT include potentially significant contributions to dose equivalent from external exposures. The licensee may substitute 1E-7uCi/ml for the listed DAC to account for the submersion dose prospectively, but should use individual monitoring devices or other radiation measuring instruments that measure external exposure to demonstrate compliance with the limits. (See RHA 3.7)

³For soluble mixtures of U-238, U-234, and U-235 in air, chemical toxicity may be the limiting factor (see RHA 3.5.5). If the percent by weight (enrichment) of U-235 is not greater than 5, the concentration value for a 40-hour workweek is 0.2 milligrams uranium per cubic meter of air average. For any enrichment, the product of the average concentration and time of exposure during a 40-hour workweek shall not exceed 8E-3 (SA) uCi-hr/ml, where SA is the specific activity of the uranium inhaled. The specific activity for natural uranium is 6.77E-7 curies per gram U. The specific activity for other mixtures of U-238, U-235, and U-234, if not known, shall be:

$$SA = 3.6E-7 \text{ curies/gram U} \quad \text{U-depleted}$$

$$SA = [0.4 + 0.38 (\text{enrichment}) + 0.0034 (\text{enrichment})^2] E-6, \text{ enrichment} \geq 0.72$$

where enrichment is the percentage by weight of U-235, expressed as percent.

NOTE: 1. If the identity of each radionuclide in a mixture is known but the concentration of one or more of the radionuclides in the mixture is not known, the DAC for the mixture shall be the most restrictive DAC of any radionuclide in the mixture.

NOTE: 2. If the identity of each radionuclide in the mixture is not known, but it is known that certain radionuclides specified in this appendix are not present in the mixture, the inhalation ALI, DAC, and effluent and sewage concentrations for the mixture are the lowest values specified in this appendix for any radionuclide that is not known to be absent from the mixture; or

Radionuclide	Table 1 Occupational Values			Table 2 Effluent <u>Concentrations</u>		Table 3 Releases to <u>Sewers</u>
	Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	Monthly Average Conc.
	Oral Ingestion ALI (uCi)	<u>Inhalation</u> ALI (uCi)	DAC (uCi/ml)	Air (uCi/ml)	Water (uCi/ml)	(uCi/ml)

If it is known that Ac-227-D and Cm-250-W are not present

- 7E-4 3E-13 - - -

If, in addition, it is known that
Ac-227-W,Y, Th-229-W,Y, Th-230-W,
Th-232-W,Y, Pa-231-W,Y, Np-237-W,
Pu-239-W, Pu-240-W, Pu-242-W,
Am-241-W, Am-242m-W, Am-243-W,

Cm-245-W, Cm-246-W, Cm-247-W,
 Cm-248-W, Bk-247-W, Cf-249-W, and
 Cf-251-W are not present - 7E-3 3E-12 - - -

If, in addition, it is known that
 Sm-146-W, Sm-147-W, Gd-148-D,W,
 Gd-152-D,W, Th-228-W,Y, Th-230-Y,
 U-232-Y, U-233-Y, U-234-Y, U-235-Y,
 U-236-Y, U-238-Y, Np-236-W,
 Pu-236-W,Y, Pu-238-W, Y, Pu-239-Y,
 Pu-240-Y, Pu-242-Y, Pu-244-W, Y,
 Cm-243-W, Cm-244-W, Cf-248-W,
 Cf-249-Y, Cf-250-W,Y, Cf-251-Y,
 Cf-252-W,Y, and Cf-254-W,Y are
 not present - 7E-2 3E-11 - - -

If, in addition, it is known that
 Pb-210-D, Bi-210m-W, Po-210-D,W,
 Ra-223-W, Ra-225-W, Ra-226-W,
 Ac-225-D,W,Y, Th-227-W,Y,
 U-230-D,W,Y, U-232-D,W, Pu-241-W,
 Cm-240-W, Cm-242-W, Cf-248-Y,
 Es-254-W, Fm-257-W, and
 Md-258-W are not present - 7E-1 3E-10 - - -

Radionuclide

If, in addition, it is known that
 Si-32-Y, Ti-44-Y, Fe-60-D, Sr-90-Y,
 Zr-93-D, Cd-113m-D, Cd-113-D,
 In-115-D,W, La-138-D, Lu-176-W,
 Hf-178m-D,W, Hf-182-D,W, Bi-210m-D,
 Ra-224-W, Ra-228-W, Ac-226-D,W,Y,
 Pa-230-W,Y, U-233-D,W, U-234-D,W,
 U-235-D,W, U-236-D,W, U-238-D,W,
 Pu-241-Y, Bk-249-W, Cf-253-W,Y,
 and Es-253-W are not present - 7E+0 3E-9 - - -

If it is known that Ac-227-D,W,Y,
 Th-229-W,Y, Th-232-W,Y, Pa-231-W,Y,
 Cm-248-W, and Cm-250-W
 are not present - - - 1E-14 - -

If, in addition, it is known that
 Sm-146-W, Gd-148-D,W, Gd-152-D,
 Th-228-W,Y, Th-230-W,Y, U-232-Y,
 U-233-Y, U-234-Y, U-235-Y, U-236-Y,
 U-238-Y, U-Nat-Y, Np-236-W, Np-237-W,
 Pu-236-W,Y, Pu-238-W, Y, Pu-239-W,Y,
 Pu-240-W,Y, Pu-242-W, Y, Pu-244-W,Y,
 Am-241-W, Am-242m-W, Am-243-W, Cm-243-W,

Cm-244-W, Cm-245-W, Cm-246-W, Cm-247-W,
 Bk-247-W, Cf-249-W,Y, Cf-250-W,Y,
 Cf-251-W,Y, Cf-252-W,Y, and
 Cf-254-W,Y are not present - - - 1E-13 - -

If, in addition, it is known that
 Sm-147-W, Gd-152-W, Pb-210-D,
 Bi-210m-W, Po-210-D,W, Ra-223-W,
 Ra-225-W, Ra-226-W, Ac-225-D,W,Y,
 Th-227-W,Y, U-230-D,W,Y, U-232-D,W,
 U-Nat-W, Pu-241-W, Cm-240-W, Cm-242-W,
 Cf-248-W,Y, Es-254-W, Fm-257-W, and
 Md-258-W are not present - - - 1E-12 - -

Radionuclide

If, in addition it is known that
 Fe-60, Sr-90, Cd-113m, Cd-113, In-115,
 I-129, Cs-134, Sm-145, Sm-147, Gd-148,
 Gd-152, Hg-194 (organic), Bi-210m,
 Ra-223, Ra-224, Ra-225, Ac-225, Th-228,
 Th-230, U-233, U-234, U-235, U-236,
 U-238, U-Nat, Cm-242, Cf-248, Es-254,
 Fm-257, and Md-258 are not present - - - 1E-6 1E-5

NOTE 3. If a mixture of radionuclides consists of uranium and its daughters in ore dust (10um AMAD particle distribution assumed) prior to chemical separation of the uranium from the ore, the following values may be used for the DAC of the mixture: 6E-11 uCi of gross alpha activity from uranium-238, uranium-234, thorium-230, and radium-226 per milliliter of air; 3E-11 uCi of natural uranium per milliliter of air; or 45 micrograms of natural uranium per cubic meter of air.

NOTE 4. If the identity and concentration of each radionuclide in a mixture are known, the limiting values should be derived as follows: determine, for each radionuclide in the mixture, the ratio between the concentration present in the mixture and the concentration otherwise established in Appendix B for the specific radionuclide when not in a mixture. The sum of such ratios for all of the radionuclides in the mixture may not exceed "1" (i.e., "unity").

Example: If radionuclides "A," "B," and "C" are present in concentrations C_A, C_B, and C_C, and if the applicable DACs are DAC_A, DAC_B, and DAC_C, respectively, then the concentrations shall be limited so that the following relationship exists:

$$\frac{C_A}{DAC_A} + \frac{C_B}{DAC_B} + \frac{C_C}{DAC_C} \leq 1$$