

Appendix G to Section 3 (Cont'd)

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs) of Radionuclides for Occupational Exposure; Effluent Concentrations; Concentrations for Release to Sewerage

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Col. 2	Col. 3	Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Inhalation ALI (μCi)	DAC ($\mu\text{Ci}/\text{ml}$)			
1	Hydrogen-3	Water, DAC includes skin absorption	8E+4	8E+4	2E-5	1E-7	1E-3	1E-2
		Gas (HT or T ₂) Submersion ^{a/} : Use above values as HT and T ₂ oxidize in air and in the body to HTO.						
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	2E+2	6E-8	2E-10	—	—
		LLI wall (1E+3)	—	—	—	—	2E-5	2E-4
		Y, see ⁷ Be	—	1E+1	6E-9	2E-11	—	—
6	Carbon-11 ^{b/}	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 ^{b/}	Submersion ^{a/}	—	—	4E-6	2E-8	—	—
8	Oxygen-15 ^{b/}	Submersion ^{a/}	—	—	4E-6	2E-8	—	—
9	Fluorine-18 ^{b/}	D, fluorides of H, Li, Na, K, Rb, Cs, and Fr	5E+4	7E+4	3E-5	1E-7	—	—
		St wall (5E+4)	—	—	—	—	7E-4	7E-3
		W, fluorides of Be, 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, and nitrates	—	1E+3	5E-7	2E-9	—	—

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
13	Aluminum-26	D, all compounds except those given for W W, oxides, hydroxides, carbides, halides, and nitrates	4E+2	6E+1	3E-8	9E-11	6E-6	6E-5
			–	9E+1	4E-8	1E-10	–	–
14	Silicon-31	D, all compounds except those given for W and Y W, oxides, hydroxides, carbides, and nitrates Y, aluminosilicate glass	9E+3	3E+4	1E-5	4E-8	1E-4	1E-3
			–	3E+4	1E-5	5E-8	–	–
			–	3E+4	1E-5	4E-8	–	–
14	Silicon-32	D, see ^{31}Si W, see ^{31}Si Y, see ^{31}Si	2E+3 LLI wall (3E+3)	2E+2	1E-7	3E-10	–	–
			–	–	–	–	4E-5	4E-4
			–	1E+2 5E+0	5E-8 2E-9	2E-10 7E-12	–	–
15	Phosphorus-32	D, all compounds except phosphates given for W W, phosphates of Zn^{2+} , S^{3+} , Mg^{2+} , Fe^{3+} , Bi^{3+} , and lanthanides	6E+2	9E+2	4E-7	1E-9	9E-6	9E-5
			–	4E+2	2E-7	5E-10	–	–
15	Phosphorus-33	D, see ^{32}P W, see ^{32}P	6E+3	8E+3	4E-6	1E-8	8E-5	8E-4
			–	3E+3	1E-6	4E-9	–	–
16	Sulfur-35	Vapor D, sulfides and sulfates except those given for W 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	–	1E+4	6E-6	2E-8	–	–
			1E+4 LLI wall (8E+3)	2E+4	7E-6	2E-8	–	–
			6E+3	–	–	–	1E-4	1E-3
16	Sulfur-35	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	–	2E+3	9E-7	3E-9	–	–
			–	2E+3	9E-7	3E-9	–	–
17	Chlorine-36	D, chlorides of H, Li, Na, K, Rb, Cs, and Fr 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+3	2E+3	1E-6	3E-9	2E-5	2E-4
			–	2E+2	1E-7	3E-10	–	–

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci/ml}$)	Col. 2 Water ($\mu\text{Ci/ml}$)	Monthly Average Concentration ($\mu\text{Ci/ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci/ml}$)			
17	Chlorine-38 ^{b/}	D, see ³⁶ Cl	2E+4 St wall (3E+4)	4E+4	2E-5	6E-8	—	—
		W, see ³⁶ Cl	—	5E+4	2E-5	6E-8	3E-4	3E-3
17	Chlorine-39 ^{b/}	D, see ³⁶ Cl	2E+4 St wall (4E+4)	5E+4	2E-5	7E-8	—	—
		W, see ³⁶ Cl	—	6E+4	2E-5	8E-8	5E-4	5E-3
18	Argon-37	Submersion ^{a/}	—	—	1E+0	6E-3	—	—
18	Argon-39	Submersion ^{a/}	—	—	2E-4	8E-7	—	—
18	Argon-41	Submersion ^{a/}	—	—	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 ^{b/}	D, all compounds	2E+4 St wall (4E+4)	7E+4	3E-5	9E-8	—	—
			—	—	—	—	5E-4	5E-3
19	Potassium-45 ^{b/}	D, all compounds	3E+4 St wall (5E+4)	1E+5	5E-5	2E-7	—	—
			—	—	—	—	7E-4	7E-3
20	Calcium-41	W, all compounds	3E+3 Bone surf (4E+3)	4E+3 Bone surf (4E+3)	2E-6	—	—	—
			—	—	—	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-44m	Y, 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 LLI wall (3E+3)	3E+3	1E-6	4E-9	—	—
			—	—	—	—	4E-5	4E-4
21	Scandium-48	Y, all compounds	8E+2	1E+3	6E-7	2E-9	1E-5	1E-4

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
21	Scandium-49 ^{b/}	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, and nitrates	–	3E+1	1E-8	4E-11	–	–
		Y, SrTiO	–	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 ^{b/}	D, all compounds except those given for W	3E+4	8E+4	3E-5	1E-7	–	–
		St wall (3E+4)	–	–	–	–	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	3E+4	1E-5	–	–	–
		LLI wall (9E+4)	–	Bone surf (3E+4)	–	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 ^{b/}	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 ^{b/}	D, all compounds except those given for W	2E+4	5E+4	2E-5	7E-8	3E-4	3E-3
		W, oxides, hydroxides, halides, and nitrates	–	6E+4	3E-5	8E-8	–	–
25	Manganese-52m ^{b/}	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	–	–

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)	Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
25	Manganese-52	D, see ^{51}Mn W, see ^{51}Mn	7E+2 -	1E+3 9E+2	5E-7 4E-7	2E-9 1E-9	1E-5 -	1E-4 -
25	Manganese-53	D, see ^{51}Mn W, see ^{51}Mn	5E+4 - -	1E+4 Bone surf (2E+4) 1E+4	5E-6 - 5E-6	- 3E-8 2E-8	7E-4 - -	7E-3 - -
25	Manganese-54	D, see ^{51}Mn W, see ^{51}Mn	2E+3 -	9E+2 8E+2	4E-7 3E-7	1E-9 1E-9	3E-5 -	3E-4 -
25	Manganese-56	D, see ^{51}Mn W, see ^{51}Mn	5E+3 -	2E+4 2E+4	6E-6 9E-6	2E-8 3E-8	7E-5 -	7E-4 -
26	Iron-52	D, all compounds except those given for W W, oxides, hydroxides, and halides	9E+2 -	3E+3 2E+3	1E-6 1E-6	4E-9 3E-9	1E-5 -	1E-4 -
26	Iron-55	D, see ^{52}Fe W, see ^{52}Fe	9E+3 -	2E+3 4E+3	8E-7 2E-6	3E-9 6E-9	1E-4 -	1E-3 -
26	Iron-59	D, see ^{52}Fe W, see ^{52}Fe	8E+2 -	3E+2 5E+2	1E-7 2E-7	5E-10 7E-10	1E-5 -	1E-4 -
26	Iron-60	D, see ^{52}Fe W, see ^{52}Fe	3E+1 -	6E+0 2E+1	3E-9 8E-9	9E-12 3E-11	4E-7 -	4E-6 -
27	Cobalt-55	W, all compounds except those given for Y Y, oxides, hydroxides, halides, and nitrates	1E+3 -	3E+3 3E+3	1E-6 1E-6	4E-9 4E-9	2E-5 -	2E-4 -
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 ^b	W, see ^{55}Co Y, see ^{55}Co	1E+6 St wall (1E+6) -	4E+6 - 3E+6	2E-3 - 1E-3	6E-6 - 4E-6	- 2E-2 -	- 2E-1 -

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
27	Cobalt-60	W, see ^{55}Co	5E+2	2E+2	7E-8	2E-10	3E-6	3E-5
		Y, see ^{55}Co	2E+2	3E+1	1E-8	5E-11	—	—
27	Cobalt-61 ^b	W, see ^{55}Co	2E+4	6E+4	3E-5	9E-8	3E-4	3E-3
		Y, see ^{55}Co	2E+4	6E+4	2E-5	8E-8	—	—
27	Cobalt-62m ^b	W, see ^{55}Co	4E+4 St wall (5E+4)	2E+5	7E-5	2E-7	—	—
		Y, see ^{55}Co	—	2E+5	6E-5	2E-7	7E-4	7E-3
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	2E+3	5E+3	2E-6	7E-9	2E-5	2E-4
		W, see ^{56}Ni	—	3E+3	1E-6	4E-9	—	—
		Vapor	—	6E+3	3E-6	9E-9	—	—
28	Nickel-59	D, see ^{56}Ni	2E+4	4E+3	2E-6	5E-9	3E-4	3E-3
		W, see ^{56}Ni	—	7E+3	3E-6	1E-8	—	—
		Vapor	—	2E+3	8E-7	3E-9	—	—
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 LLI wall (5E+2)	2E+3	7E-7	2E-9	—	—
		W, see ^{56}Ni	—	6E+2	3E-7	9E-10	6E-6	6E-5
		Vapor	—	3E+3	1E-6	4E-9	—	—
29	Copper-60 ^b	D, all compounds except those given for W and Y	3E+4 St wall (3E+4)	9E+4	4E-5	1E-7	—	—
		W, sulfides, halides, and nitrates	—	—	—	—	4E-4	4E-3
		Y, oxides and hydroxides	—	1E+5	5E-5	2E-7	—	—
29	Copper-61	D, see ^{60}Cu	1E+4	3E+4	1E-5	4E-8	2E-4	2E-3
		W, see ^{60}Cu	—	4E+4	2E-5	6E-8	—	—
		Y, see ^{60}Cu	—	4E+4	1E-5	5E-8	—	—

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
29	Copper-64	D, see ^{60}Cu	1E+4	3E+4	1E-5	4E-8	2E-4	2E-3
		W, see ^{60}Cu	—	2E+4	1E-5	3E-8	—	—
		Y, see ^{60}Cu	—	2E+4	9E-6	3E-8	—	—
29	Copper-67	D, see ^{60}Cu	5E+3	8E+3	3E-6	1E-8	6E-5	6E-4
		W, see ^{60}Cu	—	5E+3	2E-6	7E-9	—	—
		Y, see ^{60}Cu	—	5E+3	2E-6	6E-9	—	—
30	Zinc-62	Y, all compounds	1E+3	3E+3	1E-6	4E-9	2E-5	2E-4
30	Zinc-63 ^{bl}	Y, all compounds	2E+4	7E+4	3E-5	9E-8	—	—
		St wall (3E+4)	—	—	—	—	3E-4	3E-3
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 ^{bl}	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
		D, all compounds except those given for W	5E+4	2E+5	7E-5	2E-7	—	—
		St wall (6E+4)	—	—	—	—	9E-4	9E-3
		W, oxides, hydroxides, carbides, halides, and nitrates	—	2E+5	8E-5	3E-7	—	—
31	Gallium-66	D, see ^{65}Ga	1E+3	4E+3	1E-6	5E-9	1E-5	1E-4
		W, see ^{65}Ga	—	3E+3	1E-6	4E-9	—	—
31	Gallium-67	D, see ^{65}Ga	7E+3	1E+4	6E-6	2E-8	1E-4	1E-3
		W, see ^{65}Ga	—	1E+4	4E-6	1E-8	—	—
31	Gallium-68 ^{bl}	D, see ^{65}Ga	2E+4	4E+4	2E-5	6E-8	2E-4	2E-3
		W, see ^{65}Ga	—	5E+4	2E-5	7E-8	—	—
31	Gallium-70 ^{bl}	D, see ^{65}Ga	5E+4	2E+5	7E-5	2E-7	—	—
		St wall (7E+4)	—	—	—	—	1E-3	1E-2
		W, see ^{65}Ga	—	2E+5	8E-5	3E-7	—	—
31	Gallium-72	D, see ^{65}Ga	1E+3	4E+3	1E-6	5E-9	2E-5	2E-4
		W, see ^{65}Ga	—	3E+3	1E-6	4E-9	—	—
31	Gallium-73	D, see ^{65}Ga	5E+3	2E+4	6E-6	2E-8	7E-5	7E-4
		W, see ^{65}Ga	—	2E+4	6E-6	2E-8	—	—

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
32	Germanium-66	D, all compounds except those given for W W, oxides, sulfides, and halides	2E+4	3E+4	1E-5	4E-8	3E-4	3E-3
			—	2E+4	8E-6	3E-8	—	—
32	Germanium-67 ^{b/}	D, see ⁶⁶ Ge	3E+4	9E+4	4E-5	1E-7	—	—
		W, see ⁶⁶ Ge	St wall (4E+4)	—	—	—	6E-4	6E-3
			—	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 ^{b/}	D, see ⁶⁶ Ge	4E+4	8E+4	3E-5	1E-7	—	—
		W, see ⁶⁶ Ge	St wall (7E+4)	—	—	—	9E-4	9E-3
			—	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 ^{b/}	D, see ⁶⁶ Ge	2E+4	2E+4	9E-6	3E-8	—	—
		W, see ⁶⁶ Ge	St wall (2E+4)	—	—	—	3E-4	3E-3
			—	2E+4	9E-6	3E-8	—	—
33	Arsenic-69 ^{b/}	W, all compounds	3E+4	1E+5	5E-5	2E-7	—	—
			St wall (4E+4)	—	—	—	6E-4	6E-3
33	Arsenic-70 ^{b/}	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

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
33	Arsenic-77	W, all compounds	4E+3 LLI wall (5E+3)	5E+3	2E-6	7E-9	—	—
33	Arsenic-78 ^{b/}	W, all compounds	8E+3	2E+4	9E-6	3E-8	1E-4	6E-4
34	Selenium-70 ^{b/}	D, all compounds except those given for W W, oxides, hydroxides, carbides, and elemental Se	2E+4	4E+4	2E-5	5E-8	1E-4	1E-3
			1E+4	4E+4	2E-5	6E-8	—	—
34	Selenium-73m ^{b/}	D, see ⁷⁰ Se W, see ⁷⁰ Se	6E+4 3E+4	2E+5 1E+5	6E-5 6E-5	2E-7 2E-7	4E-4 —	4E-3 —
34	Selenium-73	D, see ⁷⁰ Se W, see ⁷⁰ Se	3E+3 —	1E+4 2E+4	5E-6 7E-6	2E-8 2E-8	4E-5 —	4E-4 —
34	Selenium-75	D, see ⁷⁰ Se W, see ⁷⁰ Se	5E+2 —	7E+2 6E+2	3E-7 3E-7	1E-9 8E-10	7E-6 —	7E-5 —
34	Selenium-79	D, see ⁷⁰ Se W, see ⁷⁰ Se	6E+2 —	8E+2 6E+2	3E-7 2E-7	1E-9 8E-10	8E-6 —	8E-5 —
34	Selenium-81m ^{b/}	D, see ⁷⁰ Se W, see ⁷⁰ Se	4E+4 2E+4	7E+4 7E+4	3E-5 3E-5	9E-8 1E-7	3E-4 —	3E-3 —
34	Selenium-81 ^{b/}	D, see ⁷⁰ Se	6E+4 St wall (8E+4)	2E+5	9E-5	3E-7	—	—
		W, see ⁷⁰ Se	—	2E+5	1E-4	3E-7	1E-3	1E-2
			—	—	—	—	—	—
34	Selenium-83 ^{b/}	D, see ⁷⁰ Se W, see ⁷⁰ Se	4E+4 3E+4	1E+5 1E+5	5E-5 5E-5	2E-7 2E-7	4E-4 —	4E-3 —
35	Bromine-74m ^{b/}	D, bromides of H, Li, Na, K, Rb, Cs, and Fr	1E+4 St wall (2E+4)	4E+4	2E-5	5E-8	—	—
		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	3E-4	3E-3

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
35	Bromine-74 ^{b/}	D, see ^{74m} Br	2E+4 St wall (4E+4)	7E+4	3E-5	1E-7	—	—
		W, see ^{74m} Br	—	8E+4	4E-5	1E-7	5E-4	5E-3
35	Bromine-75 ^{b/}	D, see ^{74m} Br	3E+4 St wall (4E+4)	5E+4	2E-5	7E-8	—	—
		W, see ^{74m} Br	—	5E+4	2E-5	7E-8	5E-4	5E-3
35	Bromine-76	D, see ^{74m} Br	4E+3	5E+3	2E-6	7E-9	5E-5	5E-4
		W, see ^{74m} Br	—	4E+3	2E-6	6E-9	—	—
35	Bromine-77	D, see ^{74m} Br	2E+4	2E+4	1E-5	3E-8	2E-4	2E-3
		W, see ^{74m} Br	—	2E+4	8E-6	3E-8	—	—
35	Bromine-80m	D, see ^{74m} Br	2E+4	2E+4	7E-6	2E-8	3E-4	3E-3
		W, see ^{74m} Br	—	1E+4	6E-6	2E-8	—	—
35	Bromine-80 ^{b/}	D, see ^{74m} Br	5E+4 St wall (9E+4)	2E+5	8E-5	3E-7	—	—
		W, see ^{74m} Br	—	2E+5	9E-5	3E-7	1E-3	1E-2
35	Bromine-82	D, see ^{74m} Br	3E+3	4E+3	2E-6	6E-9	4E-5	4E-4
		W, see ^{74m} Br	—	4E+3	2E-6	5E-9	—	—
35	Bromine-83	D, see ^{74m} Br	5E+4 St wall (7E+4)	6E+4	3E-5	9E-8	—	—
		W, see ^{74m} Br	—	6E+4	3E-5	9E-8	9E-4	9E-3
35	Bromine-84 ^{b/}	D, see ^{74m} Br	2E+4 St wall (3E+4)	6E+4	2E-5	8E-8	—	—
		W, see ^{74m} Br	—	6E+4	3E-5	9E-8	4E-4	4E-3
36	Krypton-74 ^{b/}	Submersion ^{a/}	—	—	3E-6	1E-8	—	—
36	Krypton-76	Submersion ^{a/}	—	—	9E-6	4E-8	—	—
36	Krypton-77 ^{b/}	Submersion ^{a/}	—	—	4E-6	2E-8	—	—
36	Krypton-79	Submersion ^{a/}	—	—	2E-5	7E-8	—	—
36	Krypton-81	Submersion ^{a/}	—	—	7E-4	3E-6	—	—
36	Krypton-83m ^{b/}	Submersion ^{a/}	—	—	1E-2	5E-5	—	—
36	Krypton-85m	Submersion ^{a/}	—	—	2E-5	1E-7	—	—

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
36	Krypton-85	Submersion ^{a/}	–	–	1E-4	7E-7	–	–
36	Krypton-87 ^{b/}	Submersion ^{a/}	–	–	5E-6	2E-8	–	–
36	Krypton-88	Submersion ^{a/}	–	–	2E-6	9E-9	–	–
37	Rubidium-79 ^{b/}	D, all compounds	4E+4	1E+5	5E-5	2E-7	–	–
			St wall (6E+4)	–	–	–	8E-4	8E-3
37	Rubidium-81m ^{b/}	D, all compounds	2E+5	3E+5	1E-4	5E-7	–	–
			St wall (3E+5)	–	–	–	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 ^{b/}	D, all compounds	2E+4	6E+4	3E-5	9E-8	–	–
			St wall (3E+4)	–	–	–	4E-4	4E-3
37	Rubidium-89 ^{b/}	D, all compounds	4E+4	1E+5	6E-5	2E-7	–	–
			St wall (6E+4)	–	–	–	9E-4	9E-3
38	Strontium-80 ^{b/}	D, all soluble compounds except SrTiO ₃	4E+3	1E+4	5E-6	2E-8	6E-5	6E-4
		Y, all insoluble com- pounds and SrTiO ₃	–	1E+4	5E-6	2E-8	–	–
38	Strontium-81 ^{b/}	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	4E+2	2E-7	6E-10	–	–
			LLI wall (2E+2)	–	–	–	3E-6	3E-5
		Y, see ⁸⁰ Sr	2E+2	9E+1	4E-8	1E-10	–	–
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 ^{b/}	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	–	–

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
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	5E+2	1E+2	6E-8	2E-10	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	3E-11 6E-12	5E-7	5E-6
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-86 ^m ^b	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 LLI wall (5E+2)	7E+2	3E-7	9E-10	–	–
		Y, see ^{86m}Y	–	6E+2	3E-7	9E-10	7E-6	7E-5
39	Yttrium-91m ^b	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 LLI wall (6E+2)	2E+2	7E-8	2E-10	–	–
		Y, see ^{86m}Y	–	1E+2	5E-8	2E-10	8E-6	8E-5

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Col. 2 ALI (μCi)	Col. 3 DAC (μCi/ml)	Col. 1 Air (μCi/ml)	Col. 2 Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
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 ^{bf}	W, see ^{86m} Y	2E+4	8E+4	3E-5	1E-7	–	–
		St wall (3E+4)	–	–	–	–	4E-4	4E-3
39	Yttrium-95 ^{bf}	Y, see ^{86m} Y	–	8E+4	3E-5	1E-7	–	–
		W, see ^{86m} Y	4E+4	2E+5	6E-5	2E-7	–	–
39	Yttrium-95 ^{bf}	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	–	–	–
		Y, see ⁸⁶ Zr	–	Bone surf (6E+1)	–	9E-11	–	–
40	Zirconium-95	D, see ⁸⁶ Zr	1E+3	1E+2	5E-8	–	2E-5	2E-4
		Bone surf (3E+2)	–	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	–	–

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
41	Niobium-88 ^b	W, all compounds except those given for Y	5E+4 St wall (7E+4)	2E+5	9E-5	3E-7	–	–
		Y, oxides and hydroxides	–	2E+5	9E-5	3E-7	1E-3	1E-2
41	Niobium-89 ^b (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 (122 min)	W, see ⁸⁸ Nb	5E+3	2E+4	8E-6	3E-8	7E-5	7E-4
		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 LLI wall (1E+4)	2E+3	8E-7	3E-9	–	–
		Y, see ⁸⁸ Nb	–	2E+2	7E-8	2E-10	2E-4	2E-3
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 LLI wall (2E+3)	3E+3	1E-6	4E-9	–	–
		Y, see ⁸⁸ Nb	–	2E+3	9E-7	3E-9	3E-5	3E-4
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 ^b	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 ^b	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	9E+3	2E+4	7E-6	2E-8	6E-5	6E-4
		Y, see ⁹⁰ Mo	4E+3	1E+4	6E-6	2E-8	–	–

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
42	Molybdenum-93	D, see ^{90}Mo	4E+3	5E+3	2E-6	8E-9	5E-5	5E-4
		Y, see ^{90}Mo	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 ^{b/}	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 ^{b/}	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 $^{93\text{m}}\text{Tc}$	3E+4	7E+4	3E-5	1E-7	4E-4	4E-3
		W, see $^{93\text{m}}\text{Tc}$	–	1E+5	4E-5	1E-7	–	–
43	Technetium-94m ^{b/}	D, see $^{93\text{m}}\text{Tc}$	2E+4	4E+4	2E-5	6E-8	3E-4	3E-3
		W, see $^{93\text{m}}\text{Tc}$	–	6E+4	2E-5	8E-8	–	–
43	Technetium-94	D, see $^{93\text{m}}\text{Tc}$	9E+3	2E+4	8E-6	3E-8	1E-4	1E-3
		W, see $^{93\text{m}}\text{Tc}$	–	2E+4	1E-5	3E-8	–	–
43	Technetium-95m	D, see $^{93\text{m}}\text{Tc}$	4E+3	5E+3	2E-6	8E-9	5E-5	5E-4
		W, see $^{93\text{m}}\text{Tc}$	–	2E+3	8E-7	3E-9	–	–
43	Technetium-95	D, see $^{93\text{m}}\text{Tc}$	1E+4	2E+4	9E-6	3E-8	1E-4	1E-3
		W, see $^{93\text{m}}\text{Tc}$	–	2E+4	8E-6	3E-8	–	–
43	Technetium-96m ^{b/}	D, see $^{93\text{m}}\text{Tc}$	2E+5	3E+5	1E-4	4E-7	2E-3	2E-2
		W, see $^{93\text{m}}\text{Tc}$	–	2E+5	1E-4	3E-7	–	–
43	Technetium-96	D, see $^{93\text{m}}\text{Tc}$	2E+3	3E+3	1E-6	5E-9	3E-5	3E-4
		W, see $^{93\text{m}}\text{Tc}$	–	2E+3	9E-7	3E-9	–	–
43	Technetium-97m	D, see $^{93\text{m}}\text{Tc}$	5E+3	7E+3	3E-6	–	6E-5	6E-4
			–	St wall (7E+3)	–	1E-8	–	–
		W, see $^{93\text{m}}\text{Tc}$	–	1E+3	5E-7	2E-9	–	–
43	Technetium-97	D, see $^{93\text{m}}\text{Tc}$	4E+4	5E+4	2E-5	7E-8	5E-4	5E-3
		W, see $^{93\text{m}}\text{Tc}$	–	6E+3	2E-6	8E-9	–	–
43	Technetium-98	D, see $^{93\text{m}}\text{Tc}$	1E+3	2E+3	7E-7	2E-9	1E-5	1E-4
		W, see $^{93\text{m}}\text{Tc}$	–	3E+2	1E-7	4E-10	–	–
43	Technetium-99m	D, see $^{93\text{m}}\text{Tc}$	8E+4	2E+5	6E-5	2E-7	1E-3	1E-2
		W, see $^{93\text{m}}\text{Tc}$	–	2E+5	1E-4	3E-7	–	–

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
43	Technetium-99	D, see $^{93\text{m}}\text{Tc}$	4E+3	5E+3 St wall	2E-6	–	6E-5	6E-4
		W, see $^{93\text{m}}\text{Tc}$	–	(6E+3) 7E+2	– 3E-7	8E-9 9E-10	–	–
43	Technetium-101 ^b	D, see $^{93\text{m}}\text{Tc}$	9E+4 St wall	3E+5	1E-4	5E-7	–	–
		W, see $^{93\text{m}}\text{Tc}$	(1E+5) –	– 4E+5	– 2E-4	– 5E-7	2E-3 –	2E-2 –
43	Technetium-104 ^b	D, see $^{93\text{m}}\text{Tc}$	2E+4 St wall	7E+4	3E-5	1E-7	–	–
		W, see $^{93\text{m}}\text{Tc}$	(3E+4) –	– 9E+4	– 4E-5	– 1E-7	4E-4 –	4E-3 –
44	Ruthenium-94 ^b	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 LLI wall	9E+1	4E-8	1E-10	–	–
		W, see ^{94}Ru	(2E+2) –	– 5E+1	– 2E-8	– 8E-11	3E-6 –	3E-5 –
		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 $^{99\text{m}}\text{Rh}$	2E+3	3E+3	1E-6	4E-9	3E-5	3E-4
		W, see $^{99\text{m}}\text{Rh}$	–	2E+3	9E-7	3E-9	–	–
		Y, see $^{99\text{m}}\text{Rh}$	–	2E+3	8E-7	3E-9	–	–
45	Rhodium-100	D, see $^{99\text{m}}\text{Rh}$	2E+3	5E+3	2E-6	7E-9	2E-5	2E-4
		W, see $^{99\text{m}}\text{Rh}$	–	4E+3	2E-6	6E-9	–	–
		Y, see $^{99\text{m}}\text{Rh}$	–	4E+3	2E-6	5E-9	–	–

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
45	Rhodium-101m	D, see $^{99\text{m}}\text{Rh}$	6E+3	1E+4	5E-6	2E-8	8E-5	8E-4
		W, see $^{99\text{m}}\text{Rh}$	–	8E+3	4E-6	1E-8	–	–
		Y, see $^{99\text{m}}\text{Rh}$	–	8E+3	3E-6	1E-8	–	–
45	Rhodium-101	D, see $^{99\text{m}}\text{Rh}$	2E+3	5E+2	2E-7	7E-10	3E-5	3E-4
		W, see $^{99\text{m}}\text{Rh}$	–	8E+2	3E-7	1E-9	–	–
		Y, see $^{99\text{m}}\text{Rh}$	–	2E+2	6E-8	2E-10	–	–
45	Rhodium-102m	D, see $^{99\text{m}}\text{Rh}$	1E+3	5E+2	2E-7	7E-10	–	–
		LLI wall (1E+3)	–	–	–	–	2E-5	2E-4
		W, see $^{99\text{m}}\text{Rh}$	–	4E+2	2E-7	5E-10	–	–
45	Rhodium-102	D, see $^{99\text{m}}\text{Rh}$	6E+2	9E+1	4E-8	1E-10	8E-6	8E-5
		W, see $^{99\text{m}}\text{Rh}$	–	2E+2	7E-8	2E-10	–	–
		Y, see $^{99\text{m}}\text{Rh}$	–	6E+1	2E-8	8E-11	–	–
45	Rhodium-103m ^{b/}	D, see $^{99\text{m}}\text{Rh}$	4E+5	1E+6	5E-4	2E-6	6E-3	6E-2
		W, see $^{99\text{m}}\text{Rh}$	–	1E+6	5E-4	2E-6	–	–
		Y, see $^{99\text{m}}\text{Rh}$	–	1E+6	5E-4	2E-6	–	–
45	Rhodium-105	D, see $^{99\text{m}}\text{Rh}$	4E+3	1E+4	5E-6	2E-8	–	–
		LLI wall (4E+3)	–	–	–	–	5E-5	5E-4
		W, see $^{99\text{m}}\text{Rh}$	–	6E+3	3E-6	9E-9	–	–
45	Rhodium-106m	D, see $^{99\text{m}}\text{Rh}$	8E+3	3E+4	1E-5	4E-8	1E-4	1E-3
		W, see $^{99\text{m}}\text{Rh}$	–	4E+4	2E-5	5E-8	–	–
		Y, see $^{99\text{m}}\text{Rh}$	–	4E+4	1E-5	5E-8	–	–
45	Rhodium-107 ^{b/}	D, see $^{99\text{m}}\text{Rh}$	7E+4	2E+5	1E-4	3E-7	–	–
		St wall (9E+4)	–	–	–	–	1E-3	1E-2
		W, see $^{99\text{m}}\text{Rh}$	–	3E+5	1E-4	4E-7	–	–
46	Palladium-100	D, all compound ^{44s} 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	–	–

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
46	Palladium-103	D, see ^{100}Pd	6E+3 LLI wall (7E+3)	6E+3	3E-6	9E-9	—	—
		W, see ^{100}Pd	—	4E+3	2E-6	6E-9	1E-4	1E-3
		Y, see ^{100}Pd	—	4E+3	1E-6	5E-9	—	—
46	Palladium-107	D, see ^{100}Pd	3E+4 LLI wall (4E+4)	2E+4 Kidneys (2E+4)	9E-6	—	—	—
		W, see ^{100}Pd	—	7E+3	3E-6	3E-8	5E-4	5E-3
		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 ^{b/}	D, all compounds except those given for W and Y	5E+4 St wall (6E+4)	2E+5	8E-5	2E-7	—	—
		W, nitrates and sulfides	—	2E+5	9E-5	3E-7	9E-4	9E-3
		Y, oxides and hydroxides	—	2E+5	8E-5	3E-7	—	—
47	Silver-103 ^{b/}	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 ^{b/}	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 ^{b/}	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 ^{b/}	D, see ^{102}Ag	6E+4 St wall (6E+4)	2E+5	8E-5	3E-7	—	—
		W, see ^{102}Ag	—	2E+5	9E-5	3E-7	9E-4	9E-3
		Y, see ^{102}Ag	—	2E+5	8E-5	3E-7	—	—

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
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	–	–
47	Silver-112	Y, see ^{102}Ag	–	9E+2	4E-7	1E-9	–	–
		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	–	–
47	Silver-115 ^{b/}	Y, see ^{102}Ag	–	9E+3	4E-6	1E-8	–	–
		D, see ^{102}Ag	3E+4	9E+4	4E-5	1E-7	–	–
		St wall	(3E+4)	–	–	–	4E-4	4E-3
48	Cadmium-104 ^{b/}	W, see ^{102}Ag	–	9E+4	4E-5	1E-7	–	–
		Y, see ^{102}Ag	–	8E+4	3E-5	1E-7	–	–
		D, all compounds except those given for W and Y W, sulfides, halides, and nitrates Y, oxides and hydroxides	2E+4	7E+4	3E-5	9E-8	3E-4	3E-3
48	Cadmium-107	W, sulfides, halides, and nitrates	–	1E+5	5E-5	2E-7	–	–
		Y, oxides and hydroxides	–	1E+5	5E-5	2E-7	–	–
		D, see ^{104}Cd	2E+4	5E+4	2E-5	8E-8	3E-4	3E-3
48	Cadmium-109	W, see ^{104}Cd	–	6E+4	2E-5	8E-8	–	–
		Y, see ^{104}Cd	–	5E+4	2E-5	7E-8	–	–
		D, see ^{104}Cd	3E+2	4E+1	1E-8	–	–	–
48	Cadmium-113m	Kidneys	(4E+2)	Kidneys (5E+1)	–	7E-11	6E-6	6E-5
		W, see ^{104}Cd	–	1E+2	5E-8	–	–	–
		Y, see ^{104}Cd	–	Kidneys (1E+2)	–	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	–	–	–
48	Cadmium-113m	Y, see ^{104}Cd	–	Kidneys (1E+1)	–	2E-11	–	–
		–	–	1E+1	5E-9	2E-11	–	–
		–	–	–	–	–	–	–

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
48	Cadmium-113	D, see ^{104}Cd	2E+1 Kidneys (3E+1)	2E+0 Kidneys (3E+0)	9E-10	–	–	–
		W, see ^{104}Cd	–	8E+0 Kidneys (1E+1)	3E-9	5E-12	4E-7	4E-6
		Y, see ^{104}Cd	–	1E+1	6E-9	2E-11	–	–
48	Cadmium-115m	D, see ^{104}Cd	3E+2	5E+1 Kidneys (8E+1)	2E-8	–	4E-6	4E-5
		W, see ^{104}Cd	–	1E+2	5E-8	1E-10	–	–
		Y, see ^{104}Cd	–	1E+2	6E-8	2E-10	–	–
48	Cadmium-115	D, see ^{104}Cd	9E+2 LLI wall (1E+3)	1E+3	6E-7	2E-9	–	–
		W, see ^{104}Cd	–	1E+3	5E-7	–	1E-5	1E-4
		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 ^{b/} (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 ^{b/}	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 ^{b/}	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	–	–

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
49	Indium-114m	D, see ^{109}In	3E+2 LLI wall (4E+2)	6E+1	3E-8	9E-11	–	–
		W, see ^{109}In	–	1E+2	4E-8	1E-10	5E-6	5E-5
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 ^{b/}	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 ^{b/}	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 ^{b/}	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 ^{b/}	D, see ^{109}In	4E+4 St wall (5E+4)	1E+5	5E-5	2E-7	–	–
		W, see ^{109}In	–	1E+5	6E-5	2E-7	7E-4	7E-3
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 ^{b/}	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 LLI wall (2E+3)	1E+3	5E-7	2E-9	–	–
		W, see ^{110}Sn	–	5E+2	2E-7	8E-10	3E-5	3E-4
50	Tin-117m	D, see ^{110}Sn	2E+3 LLI wall (2E+3)	1E+3 Bone surf (2E+3)	5E-7	–	–	–
		W, see ^{110}Sn	–	1E+3	6E-7	3E-9 2E-9	3E-5	3E-4
50	Tin-119m	D, see ^{110}Sn	3E+3 LLI wall (4E+3)	2E+3	1E-6	3E-9	–	–
		W, see ^{110}Sn	–	1E+3	4E-7	1E-9	6E-5	6E-4

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
50	Tin-121m	D, see ^{110}Sn	3E+3 LLI wall (4E+3)	9E+2	4E-7	1E-9	–	–
		W, see ^{110}Sn	–	5E+2	2E-7	8E-10	5E-5	5E-4
50	Tin-121	D, see ^{110}Sn	6E+3 LLI wall (6E+3)	2E+4	6E-6	2E-8	–	–
		W, see ^{110}Sn	–	1E+4	5E-6	2E-8	8E-5	8E-4
50	Tin-123m ^{b/}	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 LLI wall (6E+2)	6E+2	3E-7	9E-10	–	–
		W, see ^{110}Sn	–	2E+2	7E-8	2E-10	9E-6	9E-5
50	Tin-125	D, see ^{110}Sn	4E+2 LLI wall (5E+2)	9E+2	4E-7	1E-9	–	–
		W, see ^{110}Sn	–	4E+2	1E-7	5E-10	6E-6	6E-5
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 ^{b/}	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 ^{b/}	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 ^{b/}	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 ^{b/}	D, see ^{115}Sb	7E+4 St wall (9E+4)	3E+5	1E-4	4E-7	–	–
		W, see ^{115}Sb	–	3E+5	1E-4	5E-7	1E-3	1E-2
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	–	–

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
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 ^b (16 min)	D, see ^{115}Sb	1E+5 St wall (2E+5)	4E+5	2E-4	6E-7	–	–
		W, see ^{115}Sb	–	5E+5	2E-4	7E-7	2E-3	2E-2
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 LLI wall (8E+2)	2E+3	1E-6	3E-9	–	–
		W, see ^{115}Sb	7E+2	1E+3	4E-7	2E-9	1E-5	1E-4
51	Antimony-124m ^b	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 ^b	D, see ^{115}Sb	5E+4 St wall (7E+4)	2E+5	8E-5	3E-7	–	–
		W, see ^{115}Sb	–	2E+5	8E-5	3E-7	9E-4	9E-3
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 LLI wall (8E+2)	2E+3	9E-7	3E-9	–	–
		W, see ^{115}Sb	7E+2	9E+2	4E-7	1E-9	1E-5	1E-4
51	Antimony-128 ^b (10.4 min)	D, see ^{115}Sb	8E+4 St wall (1E+5)	4E+5	2E-4	5E-7	–	–
		W, see ^{115}Sb	–	4E+5	2E-4	6E-7	1E-3	1E-2
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 ^b	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	–	–

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
51	Antimony-131 ^{b/}	D, see ¹¹⁵ Sb	1E+4 Thyroid (2E+4)	2E+4 Thyroid (4E+4)	1E-5	-	-	-
		W, see ¹¹⁵ Sb	-	2E+4 Thyroid (4E+4)	1E-5	6E-8	2E-4	2E-3
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 Bone surf (7E+2)	2E+2 Bone surf (4E+2)	8E-8	-	-	-
		W, see ¹¹⁶ Te	-	4E+2	2E-7	5E-10	1E-5	1E-4
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	-	-	-
		W, see ¹¹⁶ Te	-	5E+2	2E-7	8E-10	1E-5	1E-4
52	Tellurium-123	D, see ¹¹⁶ Te	5E+2 Bone surf (1E+3)	2E+2 Bone surf (5E+2)	8E-8	-	-	-
		W, see ¹¹⁶ Te	-	4E+2	2E-7	7E-10	2E-5	2E-4
			-	Bone surf (1E+3)	-	2E-9	-	-
52	Tellurium-125m	D, see ¹¹⁶ Te	1E+3 Bone surf (1E+3)	4E+2 Bone surf (1E+3)	2E-7	-	-	-
		W, see ¹¹⁶ Te	-	7E+2	3E-7	1E-9	2E-5	2E-4
52	Tellurium-127m	D, see ¹¹⁶ Te	6E+2	3E+2 Bone surf (4E+2)	1E-7	-	9E-6	9E-5
		W, see ¹¹⁶ Te	-	3E+2	1E-7	6E-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 ^{b/}	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	-	-

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Col. 2		Col. 1 Air (μCi/ml)	Col. 2 Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	Inhalation DAC (μCi/ml)			
52	Tellurium-131m	D, see ¹¹⁶ Te	3E+2 Thyroid (6E+2)	4E+2 Thyroid (1E+3)	2E-7	–	–	–
		W, see ¹¹⁶ Te	–	4E+2 Thyroid (9E+2)	2E-7	2E-9	8E-6	8E-5
52	Tellurium-131 ^{b/}	D, see ¹¹⁶ Te	3E+3 Thyroid (6E+3)	5E+3 Thyroid (1E+4)	2E-6	–	–	–
		W, see ¹¹⁶ Te	–	5E+3 Thyroid (1E+4)	2E-6	2E-8	8E-5	8E-4
52	Tellurium-132	D, see ¹¹⁶ Te	2E+2 Thyroid (7E+2)	2E+2 Thyroid (8E+2)	9E-8	–	–	–
		W, see ¹¹⁶ Te	–	2E+2 Thyroid (6E+2)	9E-8	1E-9	9E-6	9E-5
52	Tellurium-133m ^{b/}	D, see ¹¹⁶ Te	3E+3 Thyroid (6E+3)	5E+3 Thyroid (1E+4)	2E-6	–	–	–
		W, see ¹¹⁶ Te	–	5E+3 Thyroid (1E+4)	2E-6	2E-8	9E-5	9E-4
52	Tellurium-133 ^{b/}	D, see ¹¹⁶ Te	1E+4 Thyroid (3E+4)	2E+4 Thyroid (6E+4)	9E-6	–	–	–
		W, see ¹¹⁶ Te	–	2E+4 Thyroid (6E+4)	9E-6	8E-8	4E-4	4E-3
52	Tellurium-134 ^{b/}	D, see ¹¹⁶ Te	2E+4 Thyroid (2E+4)	2E+4 Thyroid (5E+4)	1E-5	–	–	–
		W, see ¹¹⁶ Te	–	2E+4 Thyroid (5E+4)	1E-5	7E-8	3E-4	3E-3
53	Iodine-120m ^{b/}	D, all compounds	1E+4 Thyroid (1E+4)	2E+4	9E-6	3E-8	–	–
53	Iodine-120 ^{b/}	D, all compounds	4E+3 Thyroid (8E+3)	9E+3 Thyroid (1E+4)	4E-6	–	–	–
						2E-8	1E-4	1E-3

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
53	Iodine-121	D, all compounds	1E+4 Thyroid (3E+4)	2E+4 Thyroid (5E+4)	8E-6 –	– 7E-8	– 4E-4	– 4E-3
53	Iodine-123	D, all compounds	3E+3 Thyroid (1E+4)	6E+3 Thyroid (2E+4)	3E-6 –	– 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 ^b	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-132 ^m ^b	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 ^b	D, all compounds	2E+4 Thyroid (3E+4)	5E+4 –	2E-5 –	6E-8 –	– 4E-4	– 4E-3

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
53	Iodine-135	D, all compounds	8E+2 Thyroid (3E+3)	2E+3 Thyroid (4E+3)	7E-7 –	– 6E-9	– 3E-5	– 3E-4
54	Xenon-120 ^{bf}	Submersion ^{af}	–	–	1E-5	4E-8	–	–
54	Xenon-121 ^{bf}	Submersion ^{af}	–	–	2E-6	1E-8	–	–
54	Xenon-122	Submersion ^{af}	–	–	7E-5	3E-7	–	–
54	Xenon-123	Submersion ^{af}	–	–	6E-6	3E-8	–	–
54	Xenon-125	Submersion ^{af}	–	–	2E-5	7E-8	–	–
54	Xenon-127	Submersion ^{af}	–	–	1E-5	6E-8	–	–
54	Xenon-129m	Submersion ^{af}	–	–	2E-4	9E-7	–	–
54	Xenon-131m	Submersion ^{af}	–	–	4E-4	2E-6	–	–
54	Xenon-133m	Submersion ^{af}	–	–	1E-4	6E-7	–	–
54	Xenon-133	Submersion ^{af}	–	–	1E-4	5E-7	–	–
54	Xenon-135m ^{bf}	Submersion ^{af}	–	–	9E-6	4E-8	–	–
54	Xenon-135	Submersion ^{af}	–	–	1E-5	7E-8	–	–
54	Xenon-138 ^{bf}	Submersion ^{af}	–	–	4E-6	2E-8	–	–
55	Cesium-125 ^{bf}	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 ^{bf}	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

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
55	Cesium-135m ^{b/}	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 ^{b/}	D, all compounds	2E+4 St wall (3E+4)	6E+4	2E-5	8E-8	– 4E-4	– 4E-3
56	Barium-126 ^{b/}	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 ^{b/}	D, all compounds	4E+5 St wall (5E+5)	1E+6	6E-4	2E-6	– 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 LLI wall (3E+3)	9E+3	4E-6	1E-8	– 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 ^{b/}	D, all compounds	1E+4	3E+4	1E-5	4E-8	2E-4	2E-3
56	Barium-140	D, all compounds	5E+2 LLI wall (6E+2)	1E+3	6E-7	2E-9	– 8E-6	– 8E-5
56	Barium-141 ^{b/}	D, all compounds	2E+4	7E+4	3E-5	1E-7	3E-4	3E-3
56	Barium-142 ^{b/}	D, all compounds	5E+4	1E+5	6E-5	2E-7	7E-4	7E-3
57	Lanthanum-131 ^{b/}	D, all compounds except those given for W, oxides and hydroxides	5E+4 –	1E+5 2E+5	5E-5 7E-5	2E-7 2E-7	6E-4 –	6E-3 –
57	Lanthanum-132	D, see ¹³¹ La W, see ¹³¹ La	3E+3 –	1E+4 1E+4	4E-6 5E-6	1E-8 2E-8	4E-5 –	4E-4 –
57	Lanthanum-135	D, see ¹³¹ La W, see ¹³¹ La	4E+4 –	1E+5 9E+4	4E-5 4E-5	1E-7 1E-7	5E-4 –	5E-3 –

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
57	Lanthanum-137	D, see ^{131}La	1E+4	6E+1	3E-8	–	2E-4	2E-3
		W, see ^{131}La	–	Liver (7E+1)	–	1E-10	–	–
			–	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 ^{b/}	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 ^{b/}	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	–	–

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
58	Cerium-143	W, see ^{134}Ce	1E+3 LLI wall (1E+3)	2E+3	8E-7	3E-9	–	–
		Y, see ^{134}Ce	–	2E+3	7E-7	2E-9	2E-5	2E-4
58	Cerium-144	W, see ^{134}Ce	2E+2 LLI wall (3E+2)	3E+1	1E-8	4E-11	–	–
		Y, see ^{134}Ce	–	1E+1	6E-9	2E-11	3E-6	3E-5
59	Praseodymium-136 ^{b/}	W, all compounds except those given for Y	5E+4 St wall (7E+4)	2E+5	1E-4	3E-7	–	–
		Y, oxides, hydroxides, carbides, and fluorides	–	2E+5	9E-5	3E-7	1E-3	1E-2
59	Praseodymium-137 ^{b/}	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 ^{b/}	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 LLI wall (1E+3)	8E+2	3E-7	1E-9	–	–
		Y, see ^{136}Pr	–	7E+2	3E-7	9E-10	2E-5	2E-4
59	Praseodymium-144 ^{b/}	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	6E-4	6E-3
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 ^{b/}	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	1E-3	1E-2

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
60	Neodymium-136 ^b	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 ^b	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	9E+2	4E-7	1E-9	-	-
		Y, see ¹³⁶ Nd	LLI wall (1E+3)	-	-	-	2E-5	2E-4
60	Neodymium-149 ^b	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 ^b	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 ^b	W, all compounds except those given for Y	5E+4	2E+5	8E-5	3E-7	-	-
		Y, oxides, hydroxides, carbides, and fluorides	St wall (6E+4)	-	-	-	8E-4	8E-3
61	Promethium-143	W, see ¹⁴¹ Pm	5E+3	6E+2	2E-7	8E-10	7E-5	7E-4
		Y, see ¹⁴¹ Pm	-	7E+2	3E-7	1E-9	-	-
61	Promethium-144	W, see ¹⁴¹ Pm	1E+3	1E+2	5E-8	2E-10	2E-5	2E-4
		Y, see ¹⁴¹ Pm	-	1E+2	5E-8	2E-10	-	-
61	Promethium-145	W, see ¹⁴¹ Pm	1E+4	2E+2	7E-8	-	1E-4	1E-3
		Y, see ¹⁴¹ Pm	-	Bone surf (2E+2)	-	3E-10	-	-
61	Promethium-146	W, see ¹⁴¹ Pm	2E+3	5E+1	2E-8	7E-11	2E-5	2E-4
		Y, see ¹⁴¹ Pm	-	4E+1	2E-8	6E-11	-	-

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
61	Promethium-147	W, see ^{141}Pm	4E+3 LLI wall (5E+3)	1E+2 Bone surf (2E+2)	5E-8	–	–	–
		Y, see ^{141}Pm	–	1E+2	6E-8	3E-10	7E-5	7E-4
61	Promethium-148m	W, see ^{141}Pm	7E+2	3E+2	1E-7	4E-10	1E-5	1E-4
		Y, see ^{141}Pm	–	3E+2	1E-7	5E-10	–	–
61	Promethium-148	W, see ^{141}Pm	4E+2 LLI wall (5E+2)	5E+2	2E-7	8E-10	–	–
		Y, see ^{141}Pm	–	5E+2	2E-7	7E-10	7E-6	7E-5
61	Promethium-149	W, see ^{141}Pm	1E+3 LLI wall (1E+3)	2E+3	8E-7	3E-9	–	–
		Y, see ^{141}Pm	–	2E+3	8E-7	2E-9	2E-5	2E-4
61	Promethium-150	W, see ^{141}Pm	5E+3	2E+4	8E-6	3E-8	7E-5	7E-4
		Y, see ^{141}Pm	–	2E+4	7E-6	2E-8	–	–
61	Promethium-151	W, see ^{141}Pm	2E+3	4E+3	1E-6	5E-9	2E-5	2E-4
		Y, see ^{141}Pm	–	3E+3	1E-6	4E-9	–	–
62	Samarium-141m ^b	W, all compounds	3E+4	1E+5	4E-5	1E-7	4E-4	4E-3
62	Samarium-141 ^b	W, all compounds	5E+4	2E+5	8E-5	2E-7	–	–
			St wall (6E+4)	–	–	–	8E-4	8E-3
62	Samarium-142 ^b	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	4E-2	1E-11	–	–	–
			Bone surf (3E+1)	Bone surf (6E-2)	–	9E-14	3E-7	3E-6
62	Samarium-147	W, all compounds	2E+1	4E-2	2E-11	–	–	–
			Bone surf (3E+1)	Bone surf (7E-2)	–	1E-13	4E-7	4E-6
62	Samarium-151	W, all compounds	1E+4	1E+2	4E-8	–	–	–
			LLI wall (1E+4)	Bone surf (2E+2)	–	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

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
62	Samarium-155 ^{bl}	W, all compounds	6E+4 St wall (8E+4)	2E+5	9E-5	3E-7	–	–
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	4E+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 ^{bl}	W, all compounds	2E+4	6E+4	2E-5	8E-8	3E-4	3E-3
64	Gadolinium-145 ^{bl}	D, all compounds except those given for W	5E+4 St wall (5E+4)	2E+5	6E-5	2E-7	–	–
		W, oxides, hydroxides, and fluorides	–	2E+5	7E-5	–	6E-4	6E-3
			–	2E+5	7E-5	2E-7	–	–
64	Gadolinium-146	D, see ¹⁴⁵ Gd W, see ¹⁴⁵ Gd	1E+3 –	1E+2 3E+2	5E-8 1E-7	2E-10 4E-10	2E-5 –	2E-4 –
64	Gadolinium-147	D, see ¹⁴⁵ Gd W, see ¹⁴⁵ Gd	2E+3 –	4E+3 4E+3	2E-6 1E-6	6E-9 5E-9	3E-5 –	3E-4 –

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
64	Gadolinium-148	D, see ^{145}Gd	1E+1 Bone surf (2E+1)	8E+3 Bone surf (2E-2)	3E-12	–	–	–
		W, see ^{145}Gd	–	3E-2 Bone surf (6E-2)	1E-11	2E-14	3E-7	3E-6
			–	–	–	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 surf (6E+2)	2E-7	–	9E-5	9E-4
		W, see ^{145}Gd	–	1E+3	5E-7	9E-10	–	–
			–	–	–	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	3E-14	4E-7	4E-6
			–	–	–	1E-13	–	–
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	3E-10	–	–
			–	–	–	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 ^b	W, all compounds	9E+3	3E+4	1E-5	5E-8	1E-4	1E-3
65	Terbium-149	W, all compounds	5E+3	7E+2	3E-7	1E-9	7E-5	7E-4
65	Terbium-150	W, all compounds	5E+3	2E+4	9E-6	3E-8	7E-5	7E-4
65	Terbium-151	W, all compounds	4E+3	9E+3	4E-6	1E-8	5E-5	5E-4
65	Terbium-153	W, all compounds	5E+3	7E+3	3E-6	1E-8	7E-5	7E-4
65	Terbium-154	W, all compounds	2E+3	4E+3	2E-6	6E-9	2E-5	2E-4
65	Terbium-155	W, all compounds	6E+3	8E+3	3E-6	1E-8	8E-5	8E-4
65	Terbium-156m (5.0 h)	W, all compounds	2E+4	3E+4	1E-5	4E-8	2E-4	2E-3
65	Terbium-156m (24.4 h)	W, all compounds	7E+3	8E+3	3E-6	1E-8	1E-4	1E-3
65	Terbium-156	W, all compounds	1E+3	1E+3	6E-7	2E-9	1E-5	1E-4

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
65	Terbium-157	W, all compounds	5E+4 LLI wall (5E+4)	3E+2 Bone surf (6E+2)	1E-7 –	– 8E-10	– 7E-4	– 7E-3
65	Terbium-158	W, all compounds	1E+3	2E+1	8E-9	3E-11	2E-5	2E-4
65	Terbium-160	W, all compounds	8E+2	2E+2	9E-8	3E-10	1E-5	1E-4
65	Terbium-161	W, all compounds	2E+3 LLI wall (2E+3)	2E+3 –	7E-7 –	2E-9 –	– 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 LLI wall (8E+2)	7E+2 –	3E-7 –	1E-9 –	– 1E-5	– 1E-4
67	Holmium-155 ^{b/}	W, all compounds	4E+4	2E+5	6E-5	2E-7	6E-4	6E-3
67	Holmium-157 ^{b/}	W, all compounds	3E+5	1E+6	6E-4	2E-6	4E-3	4E-2
67	Holmium-159 ^{b/}	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 ^{b/}	W, all compounds	5E+4	3E+5	1E-4	4E-7	7E-4	7E-3
67	Holmium-162 ^{b/}	W, all compounds	5E+5 St wall (8E+5)	2E+6 –	1E-3 –	3E-6 –	– 1E-2	– 1E-1
67	Holmium-164m ^{b/}	W, all compounds	1E+5	3E+5	1E-4	4E-7	1E-3	1E-2
67	Holmium-164 ^{b/}	W, all compounds	2E+5 St wall (2E+5)	6E+5 –	3E-4 –	9E-7 –	– 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 LLI wall (9E+2)	2E+3 –	7E-7 –	2E-9 –	– 1E-5	– 1E-4
67	Holmium-167	W, all compounds	2E+4	6E+4	2E-5	8E-8	2E-4	2E-3

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
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 ^{bt}	W, all compounds	7E+4 St wall (7E+4)	3E+5 -	1E-4 -	4E-7 -	- 1E-3	- 1E-2
69	Thulium-166	W, all compounds	4E+3	1E+4	6E-6	2E-8	6E-5	6E-4
69	Thulium-167	W, all compounds	2E+3 LLI wall (2E+3)	2E+3 -	8E-7 -	3E-9 -	- 3E-5	- 3E-4
69	Thulium-170	W, all compounds	8E+2 LLI wall (1E+3)	2E+2 -	9E-8 -	3E-10 -	- 1E-5	- 1E-4
69	Thulium-171	W, all compounds	1E+4 LLI wall (1E+4)	3E+2 Bone surf (6E+2)	1E-7 -	- 8E-10	- 2E-4	- 2E-3
69	Thulium-172	W, all compounds	7E+2 LLI wall (8E+2)	1E+3 -	5E-7 -	2E-9 -	- 1E-5	- 1E-4
69	Thulium-173	W, all compounds	4E+3	1E+4	5E-6	2E-8	6E-5	6E-4
69	Thulium-175 ^{bt}	W, all compounds	7E+4 St wall (9E+4)	3E+5 -	1E-4 -	4E-7 -	- 1E-3	- 1E-2
70	Ytterbium-162 ^{bt}	W, all compounds except those given for Y, oxides, hydroxides, and fluorides	7E+4 -	3E+5 3E+5	1E-4 1E-4	4E-7 4E-7	1E-3 -	1E-2 -
70	Ytterbium-166	W, see ¹⁶² Yb Y, see ¹⁶² Yb	1E+3 -	2E+3 2E+3	8E-7 8E-7	3E-9 3E-9	2E-5 -	2E-4 -

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
70	Ytterbium-167 ^b	W, see ¹⁶² Yb Y, see ¹⁶² Yb	3E+5 –	8E+5 7E+5	3E-4 3E-4	1E-6 1E-6	4E-3 –	4E-2 –
70	Ytterbium-169	W, see ¹⁶² Yb Y, see ¹⁶² Yb	2E+3 –	8E+2 7E+2	4E-7 3E-7	1E-9 1E-9	2E-5 –	2E-4 –
70	Ytterbium-175	W, see ¹⁶² Yb Y, see ¹⁶² Yb	3E+3 LLI wall (3E+3) –	4E+3 – 3E+3	1E-6 – 1E-6	5E-9 – 5E-9	– – 4E-5	– – 4E-4
70	Ytterbium-177 ^b	W, see ¹⁶² Yb Y, see ¹⁶² Yb	2E+4 –	5E+4 5E+4	2E-5 2E-5	7E-8 6E-8	2E-4 –	2E-3 –
70	Ytterbium-178 ^b	W, see ¹⁶² Yb Y, see ¹⁶² Yb	1E+4 –	4E+4 4E+4	2E-5 2E-5	6E-8 5E-8	2E-4 –	2E-3 –
71	Lutetium-169	W, all compounds except those given for Y Y, oxides, hydroxides, and fluorides	3E+3 –	4E+3 4E+3	2E-6 2E-6	6E-9 6E-9	3E-5 –	3E-4 –
71	Lutetium-170	W, see ¹⁶⁹ Lu Y, see ¹⁶⁹ Lu	1E+3 –	2E+3 2E+3	9E-7 8E-7	3E-9 3E-9	2E-5 –	2E-4 –
71	Lutetium-171	W, see ¹⁶⁹ Lu Y, see ¹⁶⁹ Lu	2E+3 –	2E+3 2E+3	8E-7 8E-7	3E-9 3E-9	3E-5 –	3E-4 –
71	Lutetium-172	W, see ¹⁶⁹ Lu Y, see ¹⁶⁹ Lu	1E+3 –	1E+3 1E+3	5E-7 5E-7	2E-9 2E-9	1E-5 –	1E-4 –
71	Lutetium-173	W, see ¹⁶⁹ Lu Y, see ¹⁶⁹ Lu	5E+3 – –	3E+2 Bone surf (5E+2) 3E+2	1E-7 – 1E-7	– 6E-10 4E-10	7E-5 – –	7E-4 – –
71	Lutetium-174m	W, see ¹⁶⁹ Lu Y, see ¹⁶⁹ Lu	2E+3 LLI wall (3E+3) –	2E+2 Bone surf (3E+2) 2E+2	1E-7 – 9E-8	– 5E-10 3E-10	– 4E-5 –	– 4E-4 –
71	Lutetium-174	W, see ¹⁶⁹ Lu Y, see ¹⁶⁹ Lu	5E+3 – –	1E+2 Bone surf (2E+2) 2E+2	5E-8 – 6E-8	– 3E-10 2E-10	7E-5 – –	7E-4 – –
71	Lutetium-176m	W, see ¹⁶⁹ Lu Y, see ¹⁶⁹ Lu	8E+3 –	3E+4 2E+4	1E-5 9E-6	3E-8 3E-8	1E-4 –	1E-3 –

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
71	Lutetium-176	W, see ^{169}Lu	7E+2	5E+0 Bone surf	2E-9	–	1E-5	1E-4
		Y, see ^{169}Lu	–	(1E+1) 8E+0	– 3E-9	2E-11 1E-11	– –	– –
71	Lutetium-177m	W, see ^{169}Lu	7E+2	1E+2 Bone surf	5E-8	–	1E-5	1E-4
		Y, see ^{169}Lu	–	(1E+2) 8E+1	– 3E-8	2E-10 1E-10	– –	– –
71	Lutetium-177	W, see ^{169}Lu	2E+3 LLI wall	2E+3	9E-7	3E-9	–	–
		Y, see ^{169}Lu	(3E+3) –	– 2E+3	– 9E-7	– 3E-9	4E-5 –	4E-4 –
71	Lutetium-178m ^{b/}	W, see ^{169}Lu	5E+4 St wall	2E+5	8E-5	3E-7	–	–
		Y, see ^{169}Lu	(6E+4) –	– 2E+5	– 7E-5	– 2E-7	8E-4 –	8E-3 –
71	Lutetium-178 ^{b/}	W, see ^{169}Lu	4E+4 St wall	1E+5	5E-5	2E-7	–	–
		Y, see ^{169}Lu	(4E+4) –	– 1E+5	– 5E-5	– 2E-7	6E-4 –	6E-3 –
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 Bone surf	4E-9	–	2E-5	2E-4
		W, see ^{170}Hf	–	(2E+1) 4E+1	– 2E-8	3E-11 –	– –	– –
			–	–	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 Bone surf	4E-7	–	4E-5	4E-4
		W, see ^{170}Hf	–	(1E+3) 1E+3	– 5E-7	1E-9 2E-9	– –	– –
72	Hafnium-177m ^{b/}	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	–	–

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
72	Hafnium-178m	D, see ^{170}Hf	3E+2	1E+0	5E-10	–	3E-6	3E-5
		W, see ^{170}Hf	–	Bone surf (2E+0)	–	3E-12	–	–
72	Hafnium-179m	D, see ^{170}Hf	1E+3	3E+2	1E-7	–	1E-5	1E-4
		W, see ^{170}Hf	–	Bone surf (6E+2)	–	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
		W, see ^{170}Hf	–	Bone surf (4E+2)	–	6E-10	–	–
72	Hafnium-182m ^{b/}	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	–	–	–
		W, see ^{170}Hf	Bone surf (4E+2)	Bone surf (2E+0)	–	2E-12	5E-6	5E-5
72	Hafnium-183 ^{b/}	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 ^{b/}	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 ^{b/}	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	–	–

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
73	Tantalum-175	W, see ^{172}Ta Y, see ^{172}Ta	6E+3 –	2E+4 1E+4	7E-6 6E-6	2E-8 2E-8	8E-5 –	8E-4 –
73	Tantalum-176	W, see ^{172}Ta Y, see ^{172}Ta	4E+3 –	1E+4 1E+4	5E-6 5E-6	2E-8 2E-8	5E-5 –	5E-4 –
73	Tantalum-177	W, see ^{172}Ta Y, see ^{172}Ta	1E+4 –	2E+4 2E+4	8E-6 7E-6	3E-8 2E-8	2E-4 –	2E-3 –
73	Tantalum-178	W, see ^{172}Ta Y, see ^{172}Ta	2E+4 –	9E+4 7E+4	4E-5 3E-5	1E-7 1E-7	2E-4 –	2E-3 –
73	Tantalum-179	W, see ^{172}Ta Y, see ^{172}Ta	2E+4 –	5E+3 9E+2	2E-6 4E-7	8E-9 1E-9	3E-4 –	3E-3 –
73	Tantalum-180m	W, see ^{172}Ta Y, see ^{172}Ta	2E+4 –	7E+4 6E+4	3E-5 2E-5	9E-8 8E-8	3E-4 –	3E-3 –
73	Tantalum-180	W, see ^{172}Ta Y, see ^{172}Ta	1E+3 –	4E+2 2E+1	2E-7 1E-8	6E-10 3E-11	2E-5 –	2E-4 –
73	Tantalum-182m ^{b/}	W, see ^{172}Ta	2E+5 St wall (2E+5)	5E+5 –	2E-4 –	8E-7 –	– 3E-3	– 3E-2
		Y, see ^{172}Ta	–	4E+5	2E-4	6E-7	–	–
73	Tantalum-182	W, see ^{172}Ta Y, see ^{172}Ta	8E+2 –	3E+2 1E+2	1E-7 6E-8	5E-10 2E-10	1E-5 –	1E-4 –
73	Tantalum-183	W, see ^{172}Ta	9E+2 LLI wall (1E+3)	1E+3 –	5E-7 –	2E-9 –	– 2E-5	– 2E-4
		Y, see ^{172}Ta	–	1E+3	4E-7	1E-9	–	–
73	Tantalum-184	W, see ^{172}Ta Y, see ^{172}Ta	2E+3 –	5E+3 5E+3	2E-6 2E-6	8E-9 7E-9	3E-5 –	3E-4 –
73	Tantalum-185 ^{b/}	W, see ^{172}Ta Y, see ^{172}Ta	3E+4 –	7E+4 6E+4	3E-5 3E-5	1E-7 9E-8	4E-4 –	4E-3 –
73	Tantalum-186 ^{b/}	W, see ^{172}Ta	5E+4 St wall (7E+4)	2E+5 –	1E-4 –	3E-7 –	– 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

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
74	Tungsten-179 ^{b/}	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 LLI wall (3E+3)	7E+3 –	3E-6 –	9E-9 –	– 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 LLI wall (5E+2)	1E+3 –	5E-7 –	2E-9 –	– 7E-6	– 7E-5
75	Rhenium-177 ^{b/}	D, all compounds except those given for W	9E+4 St wall (1E+5)	3E+5 –	1E-4 –	4E-7 –	– 2E-3	– 2E-2
		W, oxides, hydroxides, and nitrates	–	4E+5	1E-4	5E-7	–	–
75	Rhenium-178 ^{b/}	D, see ¹⁷⁷ Re	7E+4 St wall (1E+5)	3E+5 –	1E-4 –	4E-7 –	– 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 (12.7 h)	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 (64.0 h)	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 St wall (2E+3)	2E+3 St wall (2E+3)	7E-7 –	– 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	–	–

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
75	Rhenium-187	D, see ^{177}Re	6E+5	8E+5 St wall	4E-4	–	8E-3	8E-2
		W, see ^{177}Re	–	(9E+5) 1E+5	– 4E-5	1E-6 1E-7	– –	– –
75	Rhenium-188m ^{b/}	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 ^{b/}	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 ^{b/}	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-182	D, 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-185	D, 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-189m	D, 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-191m	D, 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-191	D, 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	–	–
76	Osmium-193	D, 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	–	–

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
76	Osmium-194	D, see ^{180}Os	4E+2 LLI wall (6E+2)	4E+1	2E-8	6E-11	—	—
		W, see ^{180}Os	—	6E+1	2E-8	8E-11	8E-6	8E-5
		Y, see ^{180}Os	—	8E+0	3E-9	1E-11	—	—
77	Iridium-182 ^{b/}	D, all compounds except those given for W and Y	4E+4 St wall (4E+4)	1E+5	6E-5	2E-7	—	—
		W, halides, nitrates, and metallic iridium	—	2E+5	6E-5	2E-7	6E-4	6E-3
		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 LLI wall (5E+3)	5E+3	2E-6	7E-9	—	—
		W, see ^{182}Ir	—	4E+3	2E-6	5E-9	7E-5	7E-4
		Y, see ^{182}Ir	—	4E+3	1E-6	5E-9	—	—
77	Iridium-190m ^{b/}	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	—	—

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
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 LLI wall (3E+4)	6E+3 —	3E-6 —	8E-9 —	— 4E-5	— 4E-4
78	Platinum-193	D, all compounds	4E+4 LLI wall (5E+4)	2E+4 —	1E-5 —	3E-8 —	— 6E-4	— 6E-3
78	Platinum-195m	D, all compounds	2E+3 LLI wall (2E+3)	4E+3 —	2E-6 —	6E-9 —	— 3E-5	— 3E-4
78	Platinum-197m ^{b/}	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 ^{b/}	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

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
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)	–	–	–	–	4E-5	4E-4
		W, see ^{193}Au	–	4E+3	2E-6	6E-9	–	–
79	Gold-200m	Y, see ^{193}Au	–	4E+3	2E-6	5E-9	–	–
		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	–	–
79	Gold-200 ^{b/}	Y, see ^{193}Au	–	2E+4	1E-6	3E-9	–	–
		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	–	–
79	Gold-201 ^{b/}	Y, see ^{193}Au	–	7E+4	3E-5	1E-7	–	–
		D, see ^{193}Au	7E+4	2E+5	9E-5	3E-7	–	–
		St wall (9E+4)	–	–	–	–	1E-3	1E-2
80	Mercury-193m	W, see ^{193}Au	–	2E+5	1E-4	3E-7	–	–
		Y, see ^{193}Au	–	2E+5	9E-5	3E-7	–	–
		Vapor	–	8E+3	4E-6	1E-8	–	–
80	Mercury-193m	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	–	–

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
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 ^{b/}	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
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 ^{b/}	D, all compounds	5E+4 St wall (7E+4)	2E+5	6E-5	2E-7	– 1E-3	– 1E-2
81	Thallium-194 ^{b/}	D, all compounds	3E+5 St wall (3E+5)	6E+5	2E-4	8E-7	– 4E-3	– 4E-2
81	Thallium-195 ^{b/}	D, all compounds	6E+4	1E+5	5E-5	2E-7	9E-4	9E-3

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
81	Thallium-197	D, all compounds	7E+4	1E+5	5E-5	2E-7	1E-3	1E-2
81	Thallium-198m ^{bf}	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 ^{bf}	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 ^{bf}	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 –	– 6E-13	– 1E-8	– 1E-7
82	Lead-211 ^{bf}	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 –	– 2E-6	– 2E-5
82	Lead-214 ^{bf}	D, all compounds	9E+3	8E+2	3E-7	1E-9	1E-4	1E-3
83	Bismuth-200 ^{bf}	D, nitrates W, all other compounds	3E+4 –	8E+4 1E+5	4E-5 4E-5	1E-7 1E-7	4E-4 –	4E-3 –

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)	Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
83	Bismuth-201 ^{b/}	D, see ²⁰⁰ Bi W, see ²⁰⁰ Bi	1E+4 –	3E+4 4E+4	1E-5 2E-5	4E-8 5E-8	2E-4 –	2E-3 –
83	Bismuth-202 ^{b/}	D, see ²⁰⁰ Bi W, see ²⁰⁰ Bi	1E+4 –	4E+4 8E+4	2E-5 3E-5	6E-8 1E-7	2E-4 –	2E-3 –
83	Bismuth-203	D, see ²⁰⁰ Bi W, see ²⁰⁰ Bi	2E+3 –	7E+3 6E+3	3E-6 3E-6	9E-9 9E-9	3E-5 –	3E-4 –
83	Bismuth-205	D, see ²⁰⁰ Bi W, see ²⁰⁰ Bi	1E+3 –	3E+3 1E+3	1E-6 5E-7	3E-9 2E-9	2E-5 –	2E-4 –
83	Bismuth-206	D, see ²⁰⁰ Bi W, see ²⁰⁰ Bi	6E+2 –	1E+3 9E+2	6E-7 4E-7	2E-9 1E-9	9E-6 –	9E-5 –
83	Bismuth-207	D, see ²⁰⁰ Bi W, see ²⁰⁰ Bi	1E+3 –	2E+3 4E+2	7E-7 1E-7	2E-9 5E-10	1E-5 –	1E-4 –
83	Bismuth-210m	D, see ²⁰⁰ Bi	4E+1 Kidneys (6E+1)	5E+0 Kidneys (6E+0)	2E-9 –	– 9E-12	– 8E-7	– 8E-6
		W, see ²⁰⁰ Bi	–	7E-1	3E-10	9E-13	–	–
83	Bismuth-210	D, see ²⁰⁰ Bi	8E+2 –	2E+2 Kidneys (4E+2)	1E-7 –	– 5E-10	1E-5 –	1E-4 –
		W, see ²⁰⁰ Bi	–	3E+1	1E-8	4E-11	–	–
83	Bismuth-212 ^{b/}	D, see ²⁰⁰ Bi W, see ²⁰⁰ Bi	5E+3 –	2E+2 3E+2	1E-7 1E-7	3E-10 4E-10	7E-5 –	7E-4 –
83	Bismuth-213 ^{b/}	D, see ²⁰⁰ Bi W, see ²⁰⁰ Bi	7E+3 –	3E+2 4E+2	1E-7 1E-7	4E-10 5E-10	1E-4 –	1E-3 –
83	Bismuth-214 ^{b/}	D, see ²⁰⁰ Bi	2E+4 St wall (2E+4)	8E+2 –	3E-7 –	1E-9 –	– 3E-4	– 3E-3
		W, see ²⁰⁰ Bi	–	9E-2	4E-7	1E-9	–	–
84	Polonium-203 ^{b/}	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 ^{b/}	D, see ²⁰³ Po W, see ²⁰³ Po	2E+4 –	4E+4 7E+4	2E-5 3E-5	5E-8 1E-7	3E-4 –	3E-3 –
84	Polonium-207	D, see ²⁰³ Po W, see ²⁰³ Po	8E+3 –	3E+4 3E+4	1E-5 1E-5	3E-8 4E-8	1E-4 –	1E-3 –

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
84	Polonium-210	D, see ^{203}Po W, see ^{203}Po	3E+0 –	6E-1 6E-1	3E-10 3E-10	9E-13 9E-13	4E-8 –	4E-7 –
85	Astatine-207 ^b	D, halides W	6E+3 –	3E+3 2E+3	1E-6 9E-7	4E-9 3E-9	8E-5 –	8E-4 –
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 With daughters present	– –	2E+4 2E+1 (or 12 WLM)	7E-6 9E-9 (or 1.0 WL)	2E-8 3E-11	– –	– –
86	Radon-222	With daughters removed With daughters present	– –	1E+4 1E+2 (or 4 WLM)	4E-6 3E-8 (or 0.33 WL)	1E-8 1E-10	– –	– –
87	Francium-222 ^b	D, all compounds	2E+3	5E+2	2E-7	6E-10	3E-5	3E-4
87	Francium-223 ^b	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 ^b	W, all compounds	2E+4 Bone surf (2E+4)	1E+4 Bone surf (2E+4)	6E-6 –	– 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

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
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	5E-11	3E-5	3E-4
		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	7E-13	7E-7	7E-6
		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	5E-12	2E-6	2E-5
		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	1E-15	5E-9	5E-8
		Y, see ²²⁴ Ac	–	4E-3	2E-12	4E-15	–	–
89	Actinium-228	D, see ²²⁴ Ac	2E+3	9E+0 Bone surf (2E+1)	4E-9	–	3E-5	3E-4
		W, see ²²⁴ Ac	–	4E+1 Bone surf (6E+1)	2E-8	2E-11	–	–
		Y, see ²²⁴ Ac	–	4E+1	2E-8	8E-11	–	–
90	Thorium-226 ^{b/}	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	–	7E-5	7E-4
90	Thorium-227	W, see ²²⁶ Th	1E+2	3E-1	1E-10	5E-13	2E-6	2E-5
		Y, see ²²⁶ Th	–	3E-1	1E-10	5E-13	–	–
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	3E-14	2E-7	2E-6

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
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 –	–	–	2E-7 –
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 –	–	–	1E-6 –
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 –	–	–	–
		Y, see ²²⁶ Th	–	3E-3 Bone surf (4E-3)	1E-12 –	–	–	3E-7 –
90	Thorium-234	W, see ²²⁶ Th	3E+2 LLI wall (4E+2)	2E+2 –	8E-8 –	3E-10 –	–	–
		Y, see ²²⁶ Th	–	2E+2	6E-8	2E-10	5E-6	5E-5 –
91	Protactinium-227 ^{b/}	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
		Y, see ²²⁷ Pa	–	1E+1	5E-9	3E-11 2E-11	–	–
91	Protactinium-230	W, see ²²⁷ Pa	6E+2 Bone surf (9E+2)	5E+0 –	2E-9 –	7E-12 –	–	–
		Y, see ²²⁷ Pa	–	4E+0	1E-9	5E-12	1E-5	1E-4 –
91	Protactinium-231	W, see ²²⁷ Pa	2E-1 Bone surf (5E-1)	2E-3 Bone surf (4E-3)	6E-13 –	–	–	–
		Y, see ²²⁷ Pa	–	4E-3 Bone surf (6E-3)	2E-12 –	–	–	6E-8 –

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
91	Protactinium-232	W, see ²²⁷ Pa	1E+3	2E+1 Bone surf (6E+1)	9E-9	–	2E-5	2E-4
		Y, see ²²⁷ Pa	–	6E+1 Bone surf (7E+1)	2E-8	8E-11	–	–
91	Protactinium-233	W, see ²²⁷ Pa	1E+3 LLI wall (2E+3)	7E+2	3E-7	1E-9	–	–
		Y, see ²²⁷ Pa	–	6E+2	2E-7	8E-10	2E-5	2E-4
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	–	–	–
		W, UO ₃ , UF ₄ , UCl ₄	–	4E-1	1E-10	8E-13	8E-8	8E-7
		Y, UO ₂ , U ₃ O ₈	–	3E-1	1E-10	5E-13	–	–
92	Uranium-231	D, see ²³⁰ U	5E+3 LLI wall (4E+3)	8E+3	3E-6	1E-8	–	–
		W, see ²³⁰ U	–	6E+3	2E-6	–	6E-5	6E-4
		Y, see ²³⁰ U	–	5E+3	2E-6	8E-9	–	–
92	Uranium-232	D, see ²³⁰ U	2E+0 Bone surf (4E+0)	2E-1 Bone surf (4E-1)	9E-11	–	–	–
		W, see ²³⁰ U	–	4E-1	2E-10	6E-13	6E-8	6E-7
		Y, see ²³⁰ U	–	8E-3	3E-12	5E-13	–	–
92	Uranium-233	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	3E-12	3E-7	3E-6
		Y, see ²³⁰ U	–	4E-2	2E-11	1E-12	–	–
92	Uranium-234 ^f	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	3E-12	3E-7	3E-6
		Y, see ²³⁰ U	–	4E-2	2E-11	1E-12	–	–

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
92	Uranium-235 ^{cf}	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	3E-12	3E-7	3E-6
		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	3E-12	3E-7	3E-6
		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	–	3E-5	3E-4
		Y, see ²³⁰ U	–	2E+3	6E-7	2E-9	–	–
92	Uranium-238 ^{cf}	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	3E-12	3E-7	3E-6
		Y, see ²³⁰ U	–	4E-2	2E-11	6E-14	–	–
92	Uranium-239 ^{bf}	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 ^{cf}	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	3E-12	3E-7	3E-6
		Y, see ²³⁰ U	–	5E-2	2E-11	9E-13	–	–
93	Neptunium-232 ^{bf}	W, all compounds	1E+5	2E+3 Bone surf (5E+2)	7E-7	–	2E-3	2E-2
		–	–	–	6E-9	–	–	
93	Neptunium-233 ^{bf}	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 LLI wall (2E+4)	8E+2 Bone surf (1E+3)	3E-7	–	–	–
					–	2E-9	3E-4	3E-3

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci/ml}$)	Col. 2 Water ($\mu\text{Ci/ml}$)	Monthly Average Concentration ($\mu\text{Ci/ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci/ml}$)			
93	Neptunium-236 (1.15E+5 y)	W, all compounds	3E+0 Bone surf (6E+0)	2E-2 Bone surf (5E-2)	9E-12 –	– 8E-14	– 9E-8	– 9E-7
93	Neptunium-236 (22.5 h)	W, all compounds	3E+3 Bone surf (4E+3)	3E+1 Bone surf (7E+1)	1E-8 –	– 1E-10	– 5E-5	– 5E-4
93	Neptunium-237	W, all compounds	5E-1 Bone surf (1E+0)	4E-3 Bone surf (1E-2)	2E-12 –	– 1E-14	– 2E-8	– 2E-7
93	Neptunium-238	W, all compounds	1E+3 –	6E+1 Bone surf (2E+2)	3E-8 –	– 2E-10	2E-5 –	2E-4 –
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 ^b	W, all compounds	2E+4	8E+4	3E-5	1E-7	3E-4	3E-3
94	Plutonium-234	W, all compounds except PuO ₂ Y, PuO ₂	8E+3 –	2E+2 2E+2	9E-8 8E-8	3E-10 3E-10	1E-4 –	1E-3 –
94	Plutonium-235 ^b	W, see ²³⁴ Pu Y, see ²³⁴ Pu	9E+5 –	3E+6 3E+6	1E-3 1E-3	4E-6 3E-6	1E-2 –	1E-1 –
94	Plutonium-236	W, see ²³⁴ Pu Y, see ²³⁴ Pu	2E+0 Bone surf (4E+0) –	2E-2 Bone surf (4E-2) 4E-2	8E-12 – 2E-11	– 5E-14 6E-14	– 6E-8 –	– 6E-7 –
94	Plutonium-237	W, see ²³⁴ Pu Y, see ²³⁴ Pu	1E+4 –	3E+3 3E+3	1E-6 1E-6	5E-9 4E-9	2E-4 –	2E-3 –
94	Plutonium-238	W, see ²³⁴ Pu Y, see ²³⁴ Pu	9E-1 Bone surf (2E+0) –	7E-3 Bone surf (1E-2) 2E-2	3E-12 – 8E-12	– 2E-14 2E-14	– 2E-8 –	– 2E-7 –
94	Plutonium-239	W, see ²³⁴ Pu Y, see ²³⁴ Pu	8E-1 Bone surf (1E+0) –	6E-3 Bone surf (1E-2) 2E-2 Bone surf (2E-2)	3E-12 – 7E-12 –	– 2E-14 – 2E-14	– 2E-8 – –	– 2E-7 – –

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
94	Plutonium-240	W, see ^{234}Pu	8E-1 Bone surf (1E+0)	6E-3 Bone surf (1E-2)	3E-12 –	–	–	–
		Y, see ^{234}Pu	–	2E-2 Bone surf (2E-2)	7E-12 –	2E-14 2E-14	2E-8 –	2E-7 –
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 –	– 1E-12	– –	– –
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 ^b	W, all compounds	8E+4	3E+5	1E-4	4E-7	1E-3	1E-2
95	Americium-238 ^b	W, all compounds	4E+4	3E+3	1E-6	–	5E-4	5E-3
			–	Bone surf (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

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
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 –	– 1E-10	5E-5 –	5E-4 –
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 ^{b/}	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-10	4E-5 –	4E-4 –
95	Americium-245	W, all compounds	3E+4	8E+4	3E-5	1E-7	4E-4	4E-3
95	Americium-246m ^{b/}	W, all compounds	5E+4 St wall (6E+4)	2E+5 –	8E-5 –	3E-7 –	– 8E-4	– 8E-3
95	Americium-246 ^{b/}	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 surf (8E+1)	6E-1 Bone surf (6E-1)	2E-10 –	– 9E-13	– 1E-6	– 1E-5
96	Curium-241	W, all compounds	1E+3 –	3E+1 Bone surf (4E+1)	1E-8 –	– 5E-11	2E-5 –	2E-4 –
96	Curium-242	W, all compounds	3E+1 Bone surf (5E+1)	3E-1 Bone surf (3E-1)	1E-10 –	– 4E-13	– 7E-7	– 7E-6
96	Curium-243	W, all compounds	1E+0 Bone surf (2E+0)	9E-3 Bone surf (2E-2)	4E-12 –	– 2E-14	– 3E-8	– 3E-7

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
96	Curium-244	W, all compounds	1E+0 Bone surf (3E+0)	1E-2 Bone surf (2E-2)	5E-12 –	– 3E-14	– 3E-8	– 3E-7
96	Curium-245	W, all compounds	7E-1 Bone surf (1E+0)	6E-3 Bone surf (1E-2)	3E-12 –	– 2E-14	– 2E-8	– 2E-7
96	Curium-246	W, all compounds	7E-1 Bone surf (1E+0)	6E-3 Bone surf (1E-2)	3E-12 –	– 2E-14	– 2E-8	– 2E-7
96	Curium-247	W, all compounds	8E-1 Bone surf (1E+0)	6E-3 Bone surf (1E-2)	3E-12 –	– 2E-14	– 2E-8	– 2E-7
96	Curium-248	W, all compounds	2E-1 Bone surf (4E-1)	2E-3 Bone surf (3E-3)	7E-13 –	– 4E-15	– 5E-9	– 5E-8
96	Curium-249 ^b	W, all compounds	5E+4 –	2E+4 Bone surf (3E+4)	7E-6 –	– 4E-8	7E-4 –	7E-3 –
96	Curium-250	W, all compounds	4E-2 Bone surf (6E-2)	3E-4 Bone surf (5E-4)	1E-13 –	– 8E-16	– 9E-10	– 9E-9
97	Berkelium-245	W, all compounds	2E+3	1E+3	5E-7	2E-9	3E-5	3E-4
97	Berkelium-246	W, all compounds	3E+3	3E+3	1E-6	4E-9	4E-5	4E-4
97	Berkelium-247	W, all compounds	5E-1 Bone surf (1E+0)	4E-3 Bone surf (9E-3)	2E-12 –	– 1E-14	– 2E-8	– 2E-7
97	Berkelium-249	W, all compounds	2E+2 Bone surf (5E+2)	2E+0 Bone surf (4E+0)	7E-10 –	– 5E-12	– 6E-6	– 6E-5
97	Berkelium-250	W, all compounds	9E+3 –	3E+2 Bone surf (7E+2)	1E-7 –	– 1E-9	1E-4 –	1E-3 –
98	Californium-244 ^b	W, all compounds except those given for Y	3E+4 St wall (3E+4)	6E+2 –	2E-7 –	8E-10 –	– 4E-4	– 4E-3
		Y, oxides and hydroxides	–	6E+2	2E-7	8E-10	–	–

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)			
98	Californium-246	W, see ²⁴⁴ Cf Y, see ²⁴⁴ Cf	4E+2 –	9E+0 9E+0	4E-9 4E-9	1E-11 1E-11	5E-6 –	5E-5 –
98	Californium-248	W, see ²⁴⁴ Cf	8E+0 Bone surf (2E+1)	6E-2 Bone surf (1E-1)	3E-11 –	– 2E-13	– 2E-7	– 2E-6
98	Californium-249	Y, see ²⁴⁴ Cf W, see ²⁴⁴ Cf	– 5E-1 Bone surf (1E+0)	1E-1 4E-3 Bone surf (9E-3)	4E-11 2E-12 –	1E-13 – 1E-14	– – 2E-8	– – 2E-7
		Y, see ²⁴⁴ Cf	– –	1E-2 Bone surf (1E-2)	4E-12 –	– 2E-14	– –	– –
98	Californium-250	W, see ²⁴⁴ Cf	1E+0 Bone surf (2E+0)	9E-3 Bone surf (2E-2)	4E-12 –	– 3E-14	– 3E-8	– 3E-7
		Y, see ²⁴⁴ Cf	–	3E-2	1E-11	4E-14	–	–
98	Californium-251	W, see ²⁴⁴ Cf	5E-1 Bone surf (1E+0)	4E-3 Bone surf (9E-3)	2E-12 –	– 1E-14	– 2E-8	– 2E-7
		Y, see ²⁴⁴ Cf	– –	1E-2 Bone surf (1E-2)	4E-12 –	– 2E-14	– –	– –
98	Californium-252	W, see ²⁴⁴ Cf	2E+0 Bone surf (5E+0)	2E-2 Bone surf (4E-2)	8E-12 –	– 5E-14	– 7E-8	– 7E-7
		Y, see ²⁴⁴ Cf	–	3E-2	1E-11	5E-14	–	–
98	Californium-253	W, see ²⁴⁴ Cf	2E+2 Bone surf (4E+2)	2E+0 –	8E-10 –	3E-12 –	– 5E-6	– 5E-5
		Y, see ²⁴⁴ Cf	–	2E+0	7E-10	2E-12	–	–
98	Californium-254	W, see ²⁴⁴ Cf Y, see ²⁴⁴ Cf	2E+0 –	2E-2 2E-2	9E-12 7E-12	3E-14 2E-14	3E-8 –	3E-7 –
99	Einsteinium-250	W, all compounds	4E+4 –	5E+2 Bone surf (1E+3)	2E-7 –	– 2E-9	6E-4 –	6E-3 –
99	Einsteinium-251	W, all compounds	7E+3 –	9E+2 Bone surf (1E+3)	4E-7 –	– 2E-9	1E-4 –	1E-3 –
99	Einsteinium-253	W, all compounds	2E+2	1E+0	6E-10	2E-12	2E-6	2E-5

Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs)
of Radionuclides for Occupational Exposure; Effluent Concentrations;
Concentrations for Release to Sewerage (*continued*)

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers	
			Col. 1 Oral Ingestion ALI (μCi)	Inhalation		Col. 1 Air ($\mu\text{Ci}/\text{ml}$)	Col. 2 Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)	
				Col. 2 ALI (μCi)	Col. 3 DAC ($\mu\text{Ci}/\text{ml}$)				
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-13	– 2E-7	– 2E-6	
100	Fermium-252	W, all compounds	5E+2	1E+1	5E-9	2E-11	6E-6	6E-5	
100	Fermium-253	W, all compounds	1E+3	1E+1	4E-9	1E-11	1E-5	1E-4	
100	Fermium-254	W, all compounds	3E+3	9E+1	4E-8	1E-10	4E-5	4E-4	
100	Fermium-255	W, all compounds	5E+2	2E+1	9E-9	3E-11	7E-6	7E-5	
100	Fermium-257	W, all compounds	2E+1 Bone surf (4E+1)	2E-1 Bone surf (2E-1)	7E-11 –	– 3E-13	– 5E-7	– 5E-6	
101	Mendelevium-257	W, all compounds	7E+3 –	8E+1 Bone surf (9E+1)	4E-8 –	– 1E-10	1E-4 –	1E-3 –	
101	Mendelevium-258	W, all compounds	3E+1 Bone surf (5E+1)	2E-1 Bone surf (3E-1)	1E-10 –	– 5E-13	– 6E-7	– 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 ^{d/}	–	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
- 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