

**WAC 246-232-006 Exemption of certain source material.** (1) A person is exempt from the requirements for a license and from this chapter and chapters 246-233 and 246-235 WAC to the extent that the person receives, possesses, uses, transfers, or delivers, source material in any chemical mixture, compound, solution or alloy in which the source material is by weight less than 1/20 of one percent (0.05 percent) of the mixture, compound, solution, or alloy.

(2) A person is exempt from the requirements for a license and from this chapter and chapters 246-233 and 246-235 WAC to the extent that the person receives, possesses, uses or transfers unrefined and unprocessed ore containing source material, provided such person shall not refine or process such ore unless authorized to do so in a specific license.

(3) A person is exempt from the requirements for a license and from this chapter and chapters 246-221, 246-246, 246-222, 246-233, and 246-235 WAC to the extent that the person receives, possesses, uses or transfers:

- (a) Any quantities of thorium contained in:
  - (i) Incandescent gas mantles;
  - (ii) Vacuum tubes;
  - (iii) Welding rods;
  - (iv) Electric lamps for illuminating purposes if each lamp contains fifty milligrams or less of thorium;
  - (v) Germicidal lamps, sunlamps and lamps for outdoor or industrial lighting if each lamp contains two grams or less of thorium;
  - (vi) Rare earth metals and compounds, mixtures, and products containing 0.25 percent or less by weight thorium, uranium, or any combination of these; or
  - (vii) Personnel neutron dosimeters if each dosimeter contains 1.85 gigabecquerels (50 milligrams) or less of thorium;
- (b) Source material contained in the following products:
  - (i) Glazed ceramic tableware manufactured before August 27, 2013, if the glaze contains twenty percent or less by weight source material; ~~((and))~~
  - (ii) Piezoelectric ceramic containing two percent or less by weight source material; and
  - (iii) Glassware containing not more than two percent by weight source material or, for glassware manufactured before August 27, 2013, ten percent by weight source material; but not including commercially manufactured glass brick, pane glass, ceramic tile, or other glass or ceramic used in construction;
- (c) Photographic film, negatives and prints containing uranium or thorium;
- (d) Any finished product or part fabricated of, or containing, tungsten-thorium or magnesium-thorium alloys if the thorium content of the alloy is four percent or less by weight. The exemption contained in this subparagraph shall not be deemed to authorize the chemical, physical or metallurgical treatment or processing of any such product or part;
- (e) Thorium or uranium contained in or on finished optical lenses ((if each lens contains)) and mirrors, provided that each lens or mirror does not contain more than ten percent by weight of thorium or uranium or, for lenses manufactured before August 27, 2013, thirty

percent (~~or less~~) by weight of thorium. The exemption contained in this subparagraph shall not be deemed to authorize either:

(i) The shaping, grinding or polishing of such lens or mirror or manufacturing processes other than the assembly of such lens or mirror into optical systems and devices without alteration of the lens or mirror; or

(ii) The receipt, possession, use or transfer of thorium or uranium contained in contact lenses, or in spectacles, or in eyepieces in binoculars or other optical instruments;

(f) Uranium contained in detector heads for use in fire detection units if each detector head contains 185 becquerels (0.005 microcuries) or less of uranium; or

(g) Thorium contained in any finished aircraft engine part containing nickel-thoria alloy if:

(i) The thorium is dispersed in the nickel-thoria alloy in the form of finely divided thoria (thorium dioxide); and

(ii) The thorium content in the nickel-thoria alloy is four percent or less by weight.

(4) The exemptions in subsection (3) of this section do not authorize the manufacture of any of the products described.

(5) No person may initially transfer for sale or distribution a product containing source material to persons exempt under this section, or equivalent regulations of an agreement state, unless authorized by a license issued under 10 C.F.R. 40.52, chapter 246-235 WAC, or equivalent regulations of an agreement state to initially transfer such products for sale or distribution.

(a) Persons initially distributing source material in products covered by the exemptions in this section before August 27, 2013, without specific authorization may continue such distribution for one year beyond this date. Initial distribution may also be continued until NRC takes final action on a pending application for license or license amendment to specifically authorize distribution submitted no later than one year beyond this date.

(b) Persons authorized by an agreement state to manufacture, process, or produce these materials or products containing source material, and persons who import finished products or parts for sale or distribution must be authorized by a license issued under 10 C.F.R. 40.52 for distribution only and are exempt from the requirements of chapters 246-221 and 246-222 WAC, and WAC 246-235-020 (1) and (2).

AMENDATORY SECTION (Amending WSR 13-24-025, filed 11/22/13, effective 12/23/13)

**WAC 246-232-007 Exemption of certain depleted uranium items.**

(1) A person is exempt from the requirements for a license and from this chapter and chapters 246-233 and 246-235 WAC to the extent that the person receives, possesses, uses or transfers:

(a) Depleted uranium contained in counterweights installed in aircraft, rockets, projectiles and missiles, or stored or handled in connection with installation or removal of such counterweights if:

(i) ~~((The counterweights are manufactured in accordance with a specific license issued by the NRC authorizing distribution by the licensee pursuant to 10 C.F.R. Part 40;~~

~~(ii))~~ Each counterweight has been impressed with the following legend clearly legible through any plating or other covering: "DEPLETED URANIUM" \*;

~~((iii))~~ (ii) Each counterweight is durably and legibly labeled or marked with the identification of the manufacturer and the statement: "UNAUTHORIZED ALTERATIONS PROHIBITED" \*; and

~~((iv))~~ (iii) The exemption contained in this subparagraph shall not be deemed to authorize the chemical, physical or metallurgical treatment or processing of any such counterweight other than repair or restoration of any plating or other covering;

\*Note: The requirements specified in ~~((e)-(B) and (C))~~ (1)(a)(i) and (ii) of this subsection need not be met by counterweights manufactured prior to December 31, 1969: Provided, That such counterweights are impressed with the legend, "CAUTION - RADIOACTIVE MATERIAL - URANIUM," as previously required by the rules, provided that such counterweights were manufactured under a specific license issued by the Atomic Energy Commission and were impressed with the legend required by WAC 246-232-007 (1)(a)(i) in effect on June 30, 1969.

(b) Natural or depleted uranium used as shielding constituting part of any shipping container which is conspicuously and legibly impressed with the legend "CAUTION - RADIOACTIVE SHIELDING - URANIUM" and the uranium metal is encased in mild steel or in an equally fire resistant metal of a minimum wall thickness of 3.2 millimeters.

(2) The exemptions in this subsection do not authorize the manufacture of any of the products described.

AMENDATORY SECTION (Amending WSR 13-24-025, filed 11/22/13, effective 12/23/13)

**WAC 246-232-011 Exemption of certain self-luminous products containing radioactive material(s).** (1) Hydrogen-3 (tritium), krypton-85, or promethium-147.

(a) A person is exempt from the requirements for a license and from this chapter and chapters 246-233 and 246-235 WAC to the extent that the person receives, possesses, uses, transfers, owns or acquires, and does not manufacture, process, produce, apply radioactive material to, incorporate radioactive material into, or initially transfer for sale or distribution, self-luminous products containing hydrogen-3 (tritium), krypton-85, or promethium-147 in self-luminous products manufactured, processed, produced, imported or initially transferred in accordance with a specific license issued by the NRC. The exemption in this subsection does not apply to hydrogen-3, (tritium), krypton-85, or promethium-147 used in products primarily for frivolous purposes or in toys or adornments.

(b) Any person who desires to manufacture, process, produce, or initially transfer for sale or distribution self-luminous products containing tritium (H-3), krypton-85 (Kr-85), or promethium-147 (Pm-147) for use under (a) of this subsection shall apply for a license under chapter 246-235 WAC.

(2) No person may introduce radioactive material into a product or material knowing, or having reason to believe, that it will be transferred to persons exempt under this section or other sections or equivalent regulations of the NRC or an agreement state, except in accordance with a specific license issued by the NRC, Washington, D.C. 20555.

AMENDATORY SECTION (Amending WSR 13-24-025, filed 11/22/13, effective 12/23/13)

**WAC 246-232-012 Exemption of certain gas and aerosol detectors containing radioactive material.** (1) ((A)) (a) Except for persons who manufacture, process, produce, or initially transfer for sale or distribution gas or aerosol detectors containing radioactive material, any person is exempt from the requirements for a license and from this chapter and chapters 246-233 and 246-235 WAC to the extent that the person receives, possesses, uses, transfers, owns or acquires((, and does not apply radioactive material to, or incorporate radioactive material into, manufacture, process or produce,)) radioactive material in gas and aerosol detectors designed to protect ((life)) health, safety, or property ((from fires and airborne hazards if the detectors have been manufactured, imported, or transferred in accordance with a specific license issued by the NRC)), and manufactured, processed, produced, or initially transferred in accordance with a specific license issued by the department, NRC, or an agreement state which authorizes the initial transfer of the product for use under this chapter. This exemption also covers gas and aerosol detectors manufactured or distributed before November 30, 2007, in accordance with a specific license authorizing distribution to persons exempt from regulatory requirements.

(b) Any person who desires to manufacture, process, or produce gas or aerosol detectors containing radioactive material, or to initially transfer such products for use under this chapter shall apply for a license under chapter 246-235 WAC.

(2) No person may introduce radioactive material into a product or material knowing, or having reason to believe, that it will be transferred to persons exempt under this section or other sections or equivalent regulations of the NRC or an agreement state, except in accordance with a specific license issued by the NRC, Washington, D.C. 20555.

AMENDATORY SECTION (Amending WSR 13-24-025, filed 11/22/13, effective 12/23/13)

**WAC 246-232-014 Exemption of C-14 urea diagnostic capsules for human use.** (1) Except as provided in subsections (2) and (3) of this section, a person is exempt from the requirements for a license and from this chapter and chapters 246-233 and 246-235 WAC if the person receives, possesses, uses, transfers, owns, or acquires, and does not apply radioactive material to, or incorporate radioactive material into, capsules containing 37 ((kilobecquerels)) kilobecquerels (1 microcurie) of carbon-14 urea (allowing for nominal variation that may occur during the manufacturing process) each, for "in-vivo" diagnostic use for humans.

(2) A person who desires to use the capsules for research involving human subjects must apply for and receive a specific license under chapters 246-240 and 246-235 WAC.

(3) A person who desires to manufacture, prepare, process, produce, package, repackage, or transfer for commercial distribution

these capsules must do so in accordance with a specific license issued by the NRC, Washington, D.C. 20555.

(4) Nothing in this section relieves persons from complying with applicable United States Food and Drug Administration, federal, and state requirements governing receipt, administration, and use of drugs.

#### NEW SECTION

**WAC 246-232-015 Certain industrial devices.** (1) Except for persons who manufacture, process, produce, or initially transfer for sale or distribution industrial devices containing radioactive material designed and manufactured for the purpose of detecting, measuring, gauging or controlling thickness, density, level, interface location, radiation, leakage, or qualitative or quantitative chemical composition, or for producing an ionized atmosphere, any person is exempt from the requirements for a license and from the regulations in chapters 246-222, 246-221, 246-232, 246-233, 246-235, 246-243, 246-240, and 246-244 WAC to the extent that such person receives, possesses, uses, transfers, owns, or acquires radioactive material, in these certain detecting, measuring, gauging, or controlling devices and certain devices for producing an ionized atmosphere, and manufactured, processed, produced, or initially transferred in accordance with a specific license which authorizes the initial transfer of the device for use under this chapter. This exemption does not cover sources not incorporated into a device, such as calibration and reference sources.

(2) Any person who desires to manufacture, process, produce, or initially transfer for sale or distribution industrial devices containing radioactive material for use under subsection (1) of this section, shall apply for a license under chapter 246-235 WAC.

AMENDATORY SECTION (Amending WSR 09-06-003, filed 2/18/09, effective 3/21/09)

**WAC 246-232-120 Schedule B, exempt quantities of radioactive materials.** (See also WAC 246-232-010(2).)

Radioactive Material	Microcuries
Antimony-122 (Sb-122)	100
Antimony-124 (Sb-124)	10
Antimony-125 (Sb-125)	10
Arsenic-73 (As-73)	100
Arsenic-74 (As-74)	10
Arsenic-76 (As-76)	10
Arsenic-77 (As-77)	100
Barium-131 (Ba-131)	10
Barium-133 (Ba-133)	10
Barium-140 (Ba-140)	10
Bismuth-210 (Bi-210)	1

Radioactive Material	Microcuries
Bromine-82 (Br-82)	10
Cadmium-109 (Cd-109)	10
Cadmium-115m (Cd-115m)	10
Cadmium-115 (Cd-115)	100
Calcium-45 (Ca-45)	10
Calcium-47 (Ca-47)	10
Carbon-14 (C-14)	100
Cerium-141 (Ce-141)	100
Cerium-143 (Ce-143)	100
Cerium-144 (Ce-144)	1
Cesium-129 (Cs-129)	100
Cesium-131 (Cs-131)	1,000
Cesium-134m (Cs-134m)	100
Cesium-134 (Cs-134)	1
Cesium-135 (Cs-135)	10
Cesium-136 (Cs-136)	10
Cesium-137 (Cs-137)	10
Chlorine-36 (Cl-36)	10
Chlorine-38 (Cl-38)	10
Chromium-51 (Cr-51)	1,000
Cobalt-57 (Co-57)	100
Cobalt-58m (Co-58m)	10
Cobalt-58 (Co-58)	10
Cobalt-60 (Co-60)	1
Copper-64 (Cu-64)	100
Dysprosium-165 (Dy-165)	10
Dysprosium-166 (Dy-166)	100
Erbium-169 (Er-169)	100
Erbium-171 (Er-171)	100
Europium-152 (Eu-152) 9.2h	100
Europium-152 (Eu-152) 13 yr	1
Europium-154 (Eu-154)	1
Europium-155 (Eu-155)	10
Fluorine-18 (F-18)	1,000
Gadolinium-153 (Gd-153)	10
Gadolinium-159 (Gd-159)	100
Gallium-67 (Ga-67)	100
Gallium-72 (Ga-72)	10
Germanium-68 (Ge-68)	10
Germanium-71 (Ge-71)	100
Gold-195 (Au-195)	10
Gold-198 (Au-198)	100
Gold-199 (Au-199)	100
Hafnium-181 (Hf-181)	10
Holmium-166 (Ho-166)	100
Hydrogen-3 (H-3)	1,000
Indium-111 (In-111)	100

Radioactive Material	Microcuries
Indium-113m (In-113m)	100
Indium-114m (In-114m)	10
Indium-115m (In-115m)	100
Indium-115 (In-115)	10
Iodine-123 (I-123)	100
Iodine-125 (I-125)	1
Iodine-126 (I-126)	1
Iodine-129 (I-129)	0.1
Iodine-131 (I-131)	1
Iodine-132 (I-132)	10
Iodine-133 (I-133)	1
Iodine-134 (I-134)	10
Iodine-135 (I-135)	10
Iridium-192 (Ir-192)	10
Iridium-194 (Ir-194)	100
Iron-52 (Fe-52)	10
Iron-55 (Fe-55)	100
Iron-59 (Fe-59)	10
Krypton-85 (Kr-85)	100
Krypton-87 (Kr-87)	10
Lanthanum-140 (La-140)	10
Lutetium-177 (Lu-177)	100
Manganese-52 (Mn-52)	10
Manganese-54 (Mn-54)	10
Manganese-56 (Mn-56)	10
Mercury-197m (Hg-197m)	100
Mercury-197 (Hg-197)	100
Mercury-203 (Hg-203)	10
Molybdenum-99 (Mo-99)	100
Neodymium-147 (Nd-147)	100
Neodymium-149 (Nd-149)	100
Nickel-59 (Ni-59)	100
Nickel-63 (Ni-63)	10
Nickel-65 (Ni-65)	100
Niobium-93m (Nb-93m)	10
Niobium-95 (Nb-95)	10
Niobium-97 (Nb-97)	10
Osmium-185 (Os-185)	10
Osmium-191m (Os-191m)	100
Osmium-191 ( <del>(Os-191)</del> ) <u>Os-191</u>	100
Osmium-193 ( <del>(Os-193)</del> ) <u>Os-193</u>	100
Palladium-103 (Pd-103)	100
Palladium-109 (Pd-109)	100
Phosphorus-32 (P-32)	10
Platinum-191 (Pt-191)	100
Platinum-193m (Pt-193m)	100
Platinum-193 (Pt-193)	100

Radioactive Material	Microcuries
Platinum-197m (Pt-197m)	100
Platinum-197 (Pt-197)	100
Polonium-210 (Po-210)	0.1
Potassium-42 (K-42)	10
Potassium-43 (K-43)	10
Praseodymium-142 (Pr-142)	100
Praseodymium-143 (Pr-143)	100
Promethium-147 (Pm-147)	10
Promethium-149 (Pm-149)	10
Radium-226 (Ra-226)	0.1
Rhenium-186 (Re-186)	100
Rhenium-188 (Re-188)	100
Rhodium-103m (Rh-103m)	100
Rhodium-105 (Rh-105)	100
Rubidium-81 (Rb-81)	10
Rubidium-86 (Rb-86)	10
Rubidium-87 (Rb-87)	10
Ruthenium-97 (Ru-97)	100
Ruthenium-103 (Ru-103)	10
Ruthenium-105 (Ru-105)	10
Ruthenium-106 (Ru-106)	1
Samarium-151 (Sm-151)	10
Samarium-153 (Sm-153)	100
Scandium-46 (Sc-46)	10
Scandium-47 (Sc-47)	100
Scandium-48 (Sc-48)	10
Selenium-75 (Se-75)	10
Silicon-31 ( <del>(Is-31)</del> ) <u>Si-31</u> )	100
Silver-105 (Ag-105)	10
Silver-110m (Ag-110m)	1
Silver-111 (Ag-111)	100
Sodium-22 (Na-22)	10
Sodium-24 (Na-24)	10
Strontium-85 (Sr-85)	10
Strontium-89 (Sr-89)	1
Strontium-90 (Sr-90)	0.1
Strontium-91 (Sr-91)	10
Strontium-92 (Sr-92)	10
Sulphur-35 (S-35)	100
Tantalum-182 (Ta-182)	10
Technetium-96 (Tc-96)	10
Technetium-97m (Tc-97m)	100
Technetium-97 (Tc-97)	100
Technetium-99m (Tc-99m)	100
Technetium-99 (Tc-99)	10
Tellurium-125m (Te-125m)	10
Tellurium-127m (Te-127m)	10



Radioactive Material	Microcuries
Tellurium-127 (Te-127)	100
Tellurium-129m (Te-129m)	10
Tellurium-129 (Te-129)	100
Tellurium-131m (Te-131m)	10
Tellurium-132 (Te-132)	10
Terbium-160 (Tb-160)	10
Thallium-200 (Tl-200)	100
Thallium-201 (Tl-201)	100
Thallium-202 (Tl-202)	100
Thallium-204 (Tl-204)	10
Thulium-170 (Tm-170)	10
Thulium-171 (Tm-171)	10
Tin-113 (Sn-113)	10
Tin-125 (Sn-125)	10
Tungsten-181 (W-181)	10
Tungsten-185 (W-185)	10
Tungsten-187 (W-187)	100
Vanadium-48 (V-48)	10
Xenon-131m (Xe-131m)	1,000
Xenon-133 (Xe-133)	100
Xenon-135 (Xe-135)	100
Ytterbium-169 (Yb-169)	10
Ytterbium-175 (Yb-175)	100
Yttrium-87 (Y-87)	10
Yttrium-88 (Y-88)	10
Yttrium-90 (Y-90)	10
Yttrium-91 (Y-91)	10
Yttrium-92 (Y-92)	100
Yttrium-93 (Y-93)	100
Zinc-65 (Zn-65)	10
Zinc-69m (Zn-69m)	100
Zinc-69 (Zn-69)	1,000
Zirconium-93 (Zr-93)	10
Zirconium-95 (Zr-95)	10
Zirconium-97 (Zr-97)	10
Any radioactive material not listed above other than alpha emitting radioactive material	0.1

AMENDATORY SECTION (Amending WSR 13-24-025, filed 11/22/13, effective 12/23/13)

**WAC 246-232-130 Schedule C, exempt concentrations.** (See WAC 246-232-010(1).)

Element (atomic number)	Radionuclide	Column I Gas concentration $\mu\text{Ci/ml}^1$	Column II Liquid and solid concentration $\mu\text{Ci/ml}^2$
Antimony (51)	Sb-122		$3 \times 10^{-4}$
	Sb-124		$2 \times 10^{-4}$
	Sb-125		$1 \times 10^{-3}$
Argon (18)	Ar-37	$1 \times 10^{-3}$	
	Ar-41	$4 \times 10^{-7}$	
Arsenic (33)	As-73		$5 \times 10^{-3}$
	As-74		$5 \times 10^{-4}$
	As-76		$2 \times 10^{-4}$
	As-77		$8 \times 10^{-4}$
Barium (56)	Ba-131		$2 \times 10^{-3}$
	Ba-140		$3 \times 10^{-4}$
Beryllium (4)	Be-7		$2 \times 10^{-2}$
Bismuth (83)	Bi-206		$4 \times 10^{-4}$
Bromine (35)	Br-82	$4 \times 10^{-7}$	$3 \times 10^{-3}$
Cadmium (48)	Cd-109		$2 \times 10^{-3}$
	Cd-115m		$3 \times 10^{-4}$
	Cd-115		$3 \times 10^{-4}$
Calcium (20)	Ca-45		$9 \times 10^{-5}$
	Ca-47		$5 \times 10^{-4}$
Carbon (6)	C-14	$1 \times 10^{-6}$	$8 \times 10^{-3}$
Cerium (58)	Ce-141		$9 \times 10^{-4}$
	Ce-143		$4 \times 10^{-4}$
	Ce-144		$1 \times 10^{-4}$
Cesium (55)	Cs-131		$2 \times 10^{-2}$
	Cs-134m		$6 \times 10^{-2}$
	Cs-134		$9 \times 10^{-5}$
Chlorine (17)	Cl-38	$9 \times 10^{-7}$	$4 \times 10^{-3}$
Chromium (24)	Cr-51		$2 \times 10^{-2}$
Cobalt (27)	Co-57		$5 \times 10^{-3}$
	Co-58		$1 \times 10^{-3}$
	Co-60		$5 \times 10^{-4}$
Copper (29)	Cu-64		$3 \times 10^{-3}$
Dysprosium (66)	Dy-165		$4 \times 10^{-3}$
	Dy-166		$4 \times 10^{-4}$
Erbium (68)	Er-169		$9 \times 10^{-4}$
	Er-171		$1 \times 10^{-3}$
Europium (63)	Eu-152 (9.2 h)		$6 \times 10^{-4}$
	Eu-155		$2 \times 10^{-3}$
Fluorine (9)	F-18	$2 \times 10^{-6}$	$8 \times 10^{-3}$
Gadolinium (64)	Gd-153		$2 \times 10^{-3}$
	Gd-159		$8 \times 10^{-4}$
Gallium (31)	Ga-72		$4 \times 10^{-4}$
Germanium (32)	Ge-71		$2 \times 10^{-2}$
Gold (79)	Au-196		$2 \times 10^{-3}$
	Au-198		$5 \times 10^{-4}$
	Au-199		$2 \times 10^{-3}$

Element (atomic number)	Radionuclide	Column I Gas concentration $\mu\text{Ci/ml}^1$	Column II Liquid and solid concentration $\mu\text{Ci/ml}^2$
Hafnium (72)	Hf-181		$7 \times 10^{-4}$
Hydrogen (1)	H-3	$5 \times 10^{-6}$	$3 \times 10^{-2}$
Indium (49)	In-113m		$1 \times 10^{-2}$
	In-114m		$2 \times 10^{-4}$
Iodine (53)	I-125	$3 \times 10^{-9}$	$2 \times 10^{-5}$
	I-126	$3 \times 10^{-9}$	$2 \times 10^{-5}$
	I-131	$3 \times 10^{-9}$	$2 \times 10^{-5}$
	I-132	$8 \times 10^{-8}$	$6 \times 10^{-4}$
	I-133	$1 \times 10^{-8}$	$7 \times 10^{-5}$
	I-134	$2 \times 10^{-7}$	$1 \times 10^{-3}$
Iridium (77)	Ir-190		$2 \times 10^{-3}$
	Ir-192		$4 \times 10^{-4}$
	Ir-194		$3 \times 10^{-4}$
Iron (26)	Fe-55		$8 \times 10^{-3}$
	Fe-59		$6 \times 10^{-4}$
Krypton (36)	Kr-85m	$1 \times 10^{-6}$	
	Kr-85		$3 \times 10^{-6}$
Lanthanum (57)	La-140		$2 \times 10^{-4}$
Lead (82)	Pb-203		$4 \times 10^{-3}$
Lutetium (71)	Lu-177		$1 \times 10^{-3}$
Manganese (25)	Mn-52		$3 \times 10^{-4}$
	Mn-54		$1 \times 10^{-3}$
	Mn-56		$1 \times 10^{-3}$
Mercury (80)	Hg-197m		$2 \times 10^{-3}$
	Hg-197		$3 \times 10^{-3}$
	Hg-203		$2 \times 10^{-4}$
Molybdenum (42)	Mo-99		$2 \times 10^{-3}$
Neodymium (60)	<del>((And-147))</del> <u>Nd-147</u>		$6 \times 10^{-4}$
	<del>((And-149))</del> <u>Nd-149</u>		$3 \times 10^{-3}$
Nickel (28)	Ni-65		$1 \times 10^{-3}$
Niobium <del>((Columbium))</del> (41)	Nb-95		$1 \times 10^{-3}$
	Nb-97		$9 \times 10^{-3}$
Osmium (76)	<del>((So-185))</del> <u>Os-185</u>		$7 \times 10^{-4}$
	<del>((So-191m))</del> <u>Os-191m</u>		$3 \times 10^{-2}$
	<del>((So-191))</del> <u>Os-191</u>		$2 \times 10^{-3}$
	<del>((So-193))</del> <u>Os-193</u>		$6 \times 10^{-4}$
Palladium (46)	Pd-103		$3 \times 10^{-3}$
	Pd-109		$9 \times 10^{-4}$
Phosphorus (15)	P-32		$2 \times 10^{-4}$
Platinum (78)	Pt-191		$1 \times 10^{-3}$
	Pt-193m		$1 \times 10^{-2}$
	Pt-197m		$1 \times 10^{-2}$
	Pt-197		$1 \times 10^{-3}$

Element (atomic number)	Radionuclide	Column I Gas concentration $\mu\text{Ci/ml}^1$	Column II Liquid and solid concentration $\mu\text{Ci/ml}^2$
Potassium (19)	K-42		$3 \times 10^{-3}$
Praseodymium (59)	Pr-142		$3 \times 10^{-4}$
	Pr-143		$5 \times 10^{-4}$
Promethium (61)	Pm-147		$2 \times 10^{-3}$
	Pm-149		$4 \times 10^{-4}$
Radium (88)	Ra-226		$1 \times 10^{-7}$
	Ra-228		$3 \times 10^{-7}$
Rhenium (75)	Re-183		$6 \times 10^{-3}$
	Re-186		$9 \times 10^{-4}$
	Re-188		$6 \times 10^{-4}$
Rhodium (45)	Rh-103m		$1 \times 10^{-1}$
	Rh-105		$1 \times 10^{-3}$
Rubidium (37)	Rb-86		$7 \times 10^{-4}$
Ruthenium (44)	Ru-97		$4 \times 10^{-3}$
	Ru-103		$8 \times 10^{-4}$
	Ru-105		$1 \times 10^{-3}$
	Ru-106		$1 \times 10^{-4}$
Samarium (62)	Sm-153		$8 \times 10^{-4}$
Scandium (21)	Sc-46		$4 \times 10^{-4}$
	Sc-47		$9 \times 10^{-4}$
	Sc-48		$3 \times 10^{-4}$
Selenium (34)	Se-75		$3 \times 10^{-3}$
Silicon (14)	((Is-34)) <u>Si-31</u>		$9 \times 10^{-3}$
Silver (47)	Ag-105		$1 \times 10^{-3}$
	Ag-110m		$3 \times 10^{-4}$
	Ag-111		$4 \times 10^{-4}$
Sodium (11)	Na-24		$2 \times 10^{-3}$
Strontium (38)	Sr-85		$1 \times 10^{-3}$
	Sr-89		$1 \times 10^{-4}$
	Sr-91		$7 \times 10^{-4}$
	Sr-92		$7 \times 10^{-4}$
Sulfur (16)	S-35	$9 \times 10^{-8}$	$6 \times 10^{-4}$
Tantalum (73)	Ta-182		$4 \times 10^{-4}$
Technetium (43)	Tc-96m		$1 \times 10^{-1}$
	Tc-96		$1 \times 10^{-3}$
Tellurium (52)	Te-125m		$2 \times 10^{-3}$
	Te-127m		$6 \times 10^{-4}$
	Te-127		$3 \times 10^{-3}$
	Te-129m		$3 \times 10^{-4}$
	Te-131m		$6 \times 10^{-4}$
	Te-132		$3 \times 10^{-4}$
Terbium (65)	Tb-160		$4 \times 10^{-4}$
Thallium (81)	Tl-200		$4 \times 10^{-3}$
	Tl-201		$3 \times 10^{-3}$
	Tl-202		$1 \times 10^{-3}$
	Tl-204		$1 \times 10^{-3}$

Element (atomic number)	Radionuclide	Column I Gas concentration $\mu\text{Ci/ml}^1$	Column II Liquid and solid concentration $\mu\text{Ci/ml}^2$
Thulium (69)	Tm-170		$5 \times 10^{-4}$
	Tm-171		$5 \times 10^{-3}$
Tin (50)	Sn-113		$9 \times 10^{-4}$
	Sn-125		$2 \times 10^{-4}$
Tungsten (Wolfram) (74)	W-181		$4 \times 10^{-3}$
	W-187		$7 \times 10^{-4}$
Vanadium (23)	V-48		$3 \times 10^{-4}$
Xenon (54)	Xe-131m	$4 \times 10^{-6}$	
	Xe-133	$3 \times 10^{-6}$	
	Xe-135	$1 \times 10^{-6}$	
Ytterbium (70)	Yb-175		$1 \times 10^{-3}$
Yttrium (39)	Y-90		$2 \times 10^{-4}$
	Y-91m		$3 \times 10^{-2}$
	Y-91		$3 \times 10^{-4}$
	Y-92		$6 \times 10^{-4}$
	Y-93		$3 \times 10^{-4}$
Zinc (30)	Zn-65		$1 \times 10^{-3}$
	Zn-69m		$7 \times 10^{-4}$
	Zn-69		$2 \times 10^{-2}$
Zirconium (40)	Zr-95		$6 \times 10^{-4}$
	Zr-97		$2 \times 10^{-4}$
Beta or gamma emitting radioactive material not listed above with half-life less than 3 years		$1 \times 10^{-10}$	$1 \times 10^{-6}$

Notes: <sup>1</sup> Values are given in Column I only for those materials normally used as gases

<sup>2</sup>  $\mu\text{Ci/gm}$  for solids

Note 1: Many radionuclides decay into nuclides which are also radioactive. In expressing the concentrations in Schedule C the activity stated is that of the parent nuclide and takes into account the daughters.

Note 2: For purposes of WAC 246-232-010(1) where there is involved a combination of nuclides, the limit for the combination should be derived as follows: Determine for each nuclide in the product the ratio between the concentration present in the product and the exempt concentration established in Schedule C for the specific nuclide when not in combination. The sum of such ratios may not exceed "1" (i.e., unity).

Example:

$$\begin{array}{c}
 \frac{\text{Concentration of Nuclide A in Product}}{\text{Exempt concentration of Nuclide A}} \\
 + \\
 \frac{\text{Concentration of Nuclide B in Product}}{\text{Exempt concentration of Nuclide B}} \\
 \leq 1
 \end{array}$$

Note 3: For the purpose of determining concentration in a product or device, the total quantity of radioactive material present is divided by only that weight or volume of the discrete part or component throughout which the radioactive material is relatively uniformly distributed. If the weight or volume of this part or component cannot be determined then the product or device should be evaluated on the basis of the total quantity of radioactive material present.