MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES,

AND ENERGY

MATERIALS MANAGEMENT DIVISION

IONIZING RADIATION RULES FOR RADIOACTIVE MATERIAL

(By authority conferred on the director of the department of environment, great lakes, and energy by section 13521 of 1978 PA 368, MCL 333.13521, Executive Reorganization Order No. 1996-1, MCL 330.33101, and Executive Reorganization Order No. 2019-6, MCL 324.99923)

PART 2. LICENSING OF RADIOACTIVE MATERIAL

R 325.5051 Purpose and scope.

Rule 51. (1) This part provides for the licensing of radioactive material. A person shall not own, receive, acquire, possess, use**,** or transfer radioactive material except as authorized in a specific or general license issued pursuant to this part or as otherwise provided in this part.

(2) In addition to the requirements of this part, a licensee is subject to the requirements of parts 1 and 5.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

EXEMPTIONS SOURCE MATERIAL

R 325.5052 Source material as low percentage of weight.

Rule 52. A person is exempt from this part to the extent that he or she receives, possesses, uses, or transfers source material in any chemical mixture, compound, solution, or alloy in which the source material is by weight less than 1/20 of 1% (0.05%) of the mixture, compound, solution, or alloy.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5053 Unprocessed ore containing source material.

Rule 53. A person is exempt from this part to the extent that he or she receives, possesses, uses, or transfers unrefined and unprocessed ore containing source material. However, the person shall not refine or process such ore except as authorized in a specific license.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5054 Thorium used in certain articles.

Rule 54. A person is exempt from this part to the extent that he or she receives, possesses, uses, or transfers any quantity of thorium contained in the following:

(a) Incandescent gas mantles.

(b) Vacuum tubes.

(c) Welding rods.

(d) Electric lamps for illuminating purposes if each lamp does not contain more than 50 milligrams of thorium.

(e) Germicidal lamps, sunlamps, and lamps for outdoor or industrial lighting if each lamp does not contain more than 2 grams of thorium.

(f) Rare earth metals and compounds, mixtures, and products containing not more than 0.25% by weight thorium, uranium, or any combination of these.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5055 Source material contained in ceramic and other articles.

Rule 55. A person is exempt from this part to the extent that he or she receives, possesses, uses, or transfers the following:

(a) Source material contained in the following products:

(i) Glazed ceramic tableware, if the glaze contains not more than 20% by weight source material.

(ii) Glassware, glass enamel, and glass enamel frit containing not more than 10% by weight source material; but not including commercially manufactured glass brick, pane glass, ceramic tile, or other glass, glass enamel, or ceramic used in construction.

(iii) Piezoelectric ceramic containing not more than 2% by weight source material.

(b) Photographic film, negatives, and prints containing uranium or thorium.

(c) A finished product or part fabricated of, or containing, tungsten-thorium or magnesium-thorium alloys, if the thorium content of the alloy does not exceed 4% by weight. The exemption contained in this paragraph does not authorize the chemical, physical, or metallurgical treatment or processing of any such product or part.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5056 Uranium contained in counterweights.

Rule 56. (1) A person is exempt from this part to the extent that he or she receives, possesses, uses or transfers uranium contained in counterweights installed in aircraft, marinecraft, rockets, projectiles, and missiles, or stored or handled in connection with installation or removal of such counterweights if all of the following conditions are met:

(a) The counterweights are manufactured in accordance with a specific license issued by the department, the NRC, or an agreement state authorizing distribution by the licensee pursuant to this rule or equivalent regulations of the NRC or an agreement state.

(b) Each counterweight has been impressed with the following legend clearly legible through any plating or other covering: "DEPLETED URANIUM".

(c) Each counterweight is durably and legibly labeled or marked with the identification of

the manufacturer and the statement: "UNAUTHORIZED ALTERATIONS PROHIBITED".

(2) The requirements specified in subrule (1)(b) and (c) of this rule need not be met by counterweights manufactured before December 31, 1969 if the counterweights are impressed with the legend, “CAUTION - RADIOACTIVE MATERIAL - URANIUM”, as previously required by applicable regulations.

(3) The exemption in this rule does not authorize the chemical, physical**,** or metallurgical treatment or processing of counterweights other than repair or restoration of any plating or other covering.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5057 Uranium contained in shipping container shields.

Rule 57. A person is exempt from this part to the extent that he or she receives, possesses, uses, or transfers uranium used as shielding constituting part of any shipping container which is conspicuously and legibly impressed with the legend "CAUTION - RADIOACTIVE SHIELDING - URANIUM" and which meets the specifications for containers for radioactive materials prescribed by section 178.250, specification 55, part 178, of the regulations published by the United States department of transportation, 49 CFR 178.250.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5058 Thorium contained in lenses.

Rule 58. A person is exempt from this part to the extent that he or she receives, possesses, uses, or transfers thorium contained in finished optical lenses, if each lens does not contain more than 30% by weight of thorium. The exemption in this rule does not authorize either of the following:

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

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

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5059 Uranium contained in fire detection units.

Rule 59. A person is exempt from this part to the extent that he or she receives, possesses, uses, or transfers uranium contained in detector heads for use in fire detection units, if each detector head contains not more than 5 nanocuries of uranium.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5060 Thorium contained in aircraft engine parts.

Rule 60. A person is exempt from this part to the extent that he or she receives, possesses, uses, or transfers thorium contained in any finished aircraft engine part containing nickel-thoria

alloy, if both of the following conditions are met:

(a) The thorium is dispersed in the nickel-thoria alloy in the form of finely divided thoria (thorium dioxide).

(b) The thorium content in the nickel-thoria alloy does not exceed 4% by weight.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5061 Exemptions do not authorize manufacture.

Rule 61. The exemptions in Rules 54 to 60 do not authorize the manufacture of any of the products described.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5065 Exempt concentrations.

Rule 65. Except as provided in Rule 66, a person is exempt from this part to the extent that he or she owns, receives, acquires, possesses, uses, or transfers products or materials containing radioactive material in concentrations not in excess of those listed in Rule 146.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5066. Material transferred to exempt persons.

Rule 66. A person shall not introduce radioactive material into a product or material knowing or having reason to believe that it will be transferred to persons exempt under Rule 65 or equivalent regulations of the NRC or an agreement state.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5067 Items containing tritium, promethium-147, or radium.

Rule 67. Except for persons who apply tritium, promethium-147, or radium to, or persons who incorporate tritium, promethium-147, or radium into, the following products, a person is exempt from these rules to the extent that he or she owns, receives, acquires, possesses, uses, or transfers the following products:

(a) Timepieces or timepiece hands or dials containing not more than the following specified quantities of radioactive material and not exceeding the following specified levels of radiation:

(i) 25 millicuries of tritium per timepiece.

(ii) 5 millicuries of tritium per hand.

(iii) 15 millicuries of tritium per dial; bezels when used shall be considered as part of the dial.

(iv) 100 microcuries of promethium-147 per watch or 200 microcuries of promethium-147 per any other timepiece.

(v) 20 microcuries of promethium-147 per watch hand or 40 microcuries of promethium-147 per other timepiece hand.

(vi) 60 microcuries of promethium-147 per watch dial or 120 microcuries of promethium-147 per other timepiece dial; bezels when used shall be considered as part of the dial.

(vii) The levels of radiation from hands and dials containing promethium-147 will not exceed, when measured through 50 milligrams per square centimeter of absorber, the following:

(aa) For wrist watches, 0.1 millirad per hour at 10 centimeters from any surface. (bb) For pocket watches, 0.1 millirad per hour at 1 centimeter from any surface.

(cc) For any other timepiece, 0.2 millirad per hour at 10 centimeters from any surface.

(b) Timepieces or timepiece hands or dials containing not more than the following specified quantities of radium and meeting the following expressed conditions:

(i) 0.15 microcuries of radium per watch.

(ii) 0.03 microcuries of radium per watch hand.

(iii) 0.09 microcuries of radium per watch dial.

(iv) 0.20 microcuries of radium per clock.

(v) 0.04 microcuries of radium per clock hand.

(vi) 0.12 microcuries of radium per clock dial.

(vii) The timepiece is not a pocket watch.

(viii) Timepieces or timepiece hands or dials containing radium that were manufactured before the effective date of these rules.

(ix) The timepiece is marked or coded to identify the date of manufacture and that it contains radium.

(x) The timepiece emits sufficient luminosity, omitting photoactivation, that its dial can be read in the dark during its entire design lifetime.

(c) Lock illuminators containing not more than 15 millicuries of tritium or not more than 2 millicuries of promethium-147 installed in automobile locks. The levels of radiation from each lock illuminator containing promethium-147 will not exceed 1 millirad per hour at 1 centimeter from any surface when measured through 50 milligrams per square centimeter of absorber.

(d) Precision balances containing not more than 1 millicurie of tritium per balance or not more than 0.5 millicurie of tritium per balance part.

(e) Automobile shift quadrants containing not more than 25 millicuries of tritium.

(f) Marine compasses containing not more than 750 millicuries of tritium gas and other marine navigational instruments containing not more than 250 millicuries of tritium gas.

(g) Thermostat dials and pointers containing not more than 25 millicuries of tritium per thermostat.

(h) Electron tubes, including spark gap tubes, power tubes, gas tubes including glow lamps, receiving tubes, microwave tubes, indicator tubes, pick-up tubes, radiation detection tubes and any other completely sealed tube that is designed to conduct or control electrical currents, if the level of radiation due to radioactive material contained in each electron tube does not exceed 1 millirad per hour at 1 centimeter from any surface when measured through 7 milligrams per square centimeter of absorber and if each tube does not contain more than 1 of the following specified quantities of radioactive materials:

(i) 150 millicuries of tritium per microwave receiver protector tube or 10 millicuries of tritium per any other electron tube.

(ii) 1 microcurie of cobalt-60.

(iii) 5 microcuries of nickel-63.

(iv) 30 microcuries of krypton-85.

(v) 5 microcuries of cesium-137.

(vi) 30 microcuries of promethium-147.

(i) Ionizing radiation measuring instruments containing, for purposes of internal calibration or standardization, a source of radioactive material not exceeding the applicable quantity set forth in Rule 147.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5071 Resins containing scandium-46 for sand consolidation in oil wells.

Rule 71. A person is exempt from these rules to the extent that he or she owns, receives, acquires, possesses, uses, or transfers synthetic plastic resins containing scandium-46 which are designed for sand consolidation in oil wells if the resins were manufactured or imported in accordance with a specific license issued by the NRC, or were manufactured in accordance with the specifications contained in a specific license issued by the department or an agreement state to the manufacturer of such resins pursuant to licensing requirements equivalent to those in sections 32.16 and 32.17 of 10 CFR Part 32 of the regulations of the NRC. This exemption does not authorize the manufacturer of resins containing scandium-46.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5072 Gas and aerosol detectors.

Rule 72. Except for persons who manufacture, process, or produce gas and aerosol detectors, a person is exempt from these rules to the extent that he or she owns, receives, acquires, possesses, uses, or transfers the following:

(a) Byproduct material in gas and aerosol detectors designed to protect life or property from fires and airborne hazards, if the detectors containing byproduct material were manufactured, imported, or transferred in accordance with a specific license issued by the NRC pursuant to section 32.26 of 10 CFR Part 32, which license authorizes the transfer of the detectors to persons who are exempt from regulatory requirements.

(b) Naturally occurring material in gas and aerosol detectors designed to protect life or property from fires and airborne hazards, if the detectors containing naturally occurring material were manufactured, imported, or transferred in accordance with a specific license issued by the department or an agreement state pursuant to equivalent conditions as in section 32.26 of 10 CFR Part 32, which license authorizes the transfer of the detectors to persons who are exempt from regulatory requirements.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5073 Self-luminous products containing tritium, krypton-85, promethium-147, or radium-226.

Rule 73. (1) Except for a person who manufactures, processes, or produces self-luminous products, a person is exempt from these regulations to the extent that he or she owns, receives, acquires, possesses, uses, or transfers the following:

(a) Tritium, krypton-85, or promethium-147 in self-luminous products manufactured, processed, imported, or transferred in accordance with a specific license issued by the NRC

pursuant to section 32.22 of 10 CFR Part 32, which license authorizes the transfer of the product to persons who are exempt from regulatory requirements.

(b) Naturally occurring material in self-luminous products manufactured, processed, imported, or transferred in accordance with a specific license issued by the department or an agreement state pursuant to equivalent conditions as in section 32.22 of 10 CFR Part 32.

(2) The exemptions in subrule (1) of this rule do not apply to tritium, krypton-85, promethium-147, or naturally occurring material used in products for frivolous purposes or in toys or adornments.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

EXEMPTIONS
RADIOACTIVE MATERIAL OTHER THAN SOURCE MATERIAL

R 325.5074 Exempt quantities.

Rule 74. (1) Except as provided in subrules (3) and (4) of this rule, a person is exempt from these rules to the extent that he or she owns, receives, acquires, possesses, uses, or transfers a byproduct, naturally occurring, or accelerator material in individual quantities each of which does not exceed the applicable quantity set forth in Rule 147.

(2) A person who possesses radioactive material formerly received or acquired under the general license provided in 10 CFR Part 31, § 31.4 of the NRC regulations is exempt from the requirements for a license set forth in this part to the extent that he or she owns, possesses, uses, or transfers such radioactive material.

(3) Subrule (1) of this rule does not authorize the production, packaging, or repackaging of radioactive material for purposes of commercial distribution, or the incorporation of radioactive material into products intended for commercial distribution.

(4) A person, for purposes of commercial distribution, shall not transfer radioactive material in the individual quantities set forth in Rule 147, knowing or having reason to believe that such quantities of radioactive material will be transferred to persons exempt under subrule (1) of this rule or equivalent regulations of the NRC or an agreement state, except in accordance with a specific license issued by the NRC pursuant to section 32.18 of 10 CFR Part 32 which license

states that the radioactive material may be transferred by the licensee to persons exempt under subrule (1) of this rule or the equivalent regulations of the NRC or an agreement state.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

GENERAL LICENSES

R 325.5081 Types of licenses.

Rule 81. Licenses for radioactive materials are of 2 types: general or specific. General licenses provided in this part are effective without the filing of applications with the department or the issuance of licensing documents to particular persons. Specific licenses are issued to

named persons upon applications filed pursuant to this part.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5082 Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5083 Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5084 Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5085 Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5086 Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5087 Ownership of radioactive material.

Rule 87. This rule is a general license issued to own radioactive material without regard to quantity. Notwithstanding any other provisions of this part, this general license does not authorize the manufacture, production, transfer, receipt, possession**,** or use of radioactive material.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5088 Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5089 Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5090 Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5091 Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5092 Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

SPECIFIC LICENSES

R 325.5101 Applications.

Rule 101. (1) An application for a specific license shall be filed on a form prescribed by the department and shall be accompanied by the appropriate license fee as specified in Rules 141 to 145.

(2) The application shall be signed by the applicant or licensee or a person authorized to act for and on his or her behalf.

(3) An application for a license may include a request for a license authorizing 1 or more activities.

(4) In his or her application, the applicant may incorporate by reference information contained in previous applications, statements, or reports filed with the department if the references are clear and specific.

(5) The department, at any time after the filing of the original application, and before the expiration of the license, may require further statements in order for the department to determine whether the application will be granted or denied or whether a license will be modified or revoked.

(6) The department may make available the application and documents submitted to the department for public inspection except that the department may withhold any document or part thereof from public inspection if disclosure of its content is not required in the public interest and would adversely affect the interest of a person concerned.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5102 General requirements for specific licenses.

Rule 102. The department shall approve a license application if it determines all of the following:

(a) The applicant or the designated individual user is qualified by reason of training and experience to use the material in question for the purpose requested in accordance with these rules in such a manner as to minimize danger to public health and safety or property.

(b) The applicant's proposed equipment, facilities, and procedures are adequate to minimize danger to public health and safety or property.

(c) The issuance of the license will not be inimical to the health and safety of the public.

(d) The applicant satisfies any applicable special requirements in Rule 117a.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5103 Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5104 Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5105 Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5106 Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5107 Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5108 Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5109 Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5110 Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5111 Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5111a Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5111b Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5111c Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5112 Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5113 Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5114 Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5115 Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5116 Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5117 Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

SPECIAL REQUIREMENTS FOR ISSUANCE OF CERTAIN SPECIFIC LICENSES

R 325.5117a Particle accelerator licenses.

Rule 117a. (1) A particle accelerator capable of producing radioactive material in excess of exempt quantities listed in schedule B of Rule 147 shall not be operated in a manner likely to produce such quantities of radioactive material unless a person is authorized to operate in a specific license issued pursuant to this rule.

(2) Subject to Rule 122 a person shall submit an application for a specific license to operate a particle accelerator subject to this rule in accordance with Rule 101.

(3) The department shall issue a specific license for a particle accelerator subject to licensing under this rule when it determines all of the following:

(a) The applicant will have an adequate program for training accelerator operators and submits to the department a schedule or description of the program which specifies the following:

(i) Initial training.

(ii) Periodic training.

(iii) On-the-job training.

(iv) Means to be used by the licensee to determine the operator's knowledge and understanding of and ability to comply with department rules and licensing requirements, and the operating and emergency procedures of the applicant.

(b) The applicant has established and submits to the department satisfactory written operating and emergency procedures.

(c) The applicant will have an adequate internal inspection system, or other management control, to assure that license provisions, rules, and the applicant's operating and emergency procedures are followed by operators and all other individuals associated with the accelerator operation.

(d) The applicant submits to the department a description of his or her overall organizational structure pertaining to the particle accelerator program, including specified delegations of authority and responsibility for operation of the program.

(e) The applicant has applied for or has been issued a valid license to own, receive, acquire, possess, use, and transfer radioactive material produced or used in connection with accelerator operation.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5118 Issuance of specific licenses.

Rule 118. (1) As used in this rule, "as it deems appropriate or necessary" means as the department determines is appropriate or necessary in order to minimize danger to public health and safety or property; and prevent loss or theft of material subject to this part.

(2) Upon a determination that an application meets the requirements of the act and these rules the department shall issue a specific license authorizing the proposed activity in such form and containing such conditions and limitations as it deems appropriate or necessary.

(3) The department may incorporate in any license at the time of issuance, or thereafter, by appropriate rule or order, such additional requirements and conditions with respect to the licensee's receipt, possession, use, and transfer of radioactive material subject to this part as it deems appropriate or necessary.

(4) The department may require such reports and the keeping of such records, and may provide for such inspections of activities under the license as it deems appropriate or necessary.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5119 Specific terms and conditions of licenses.

Rule 119. (1) A license issued under this part is subject to all the provisions of the act, now or hereafter in effect, and to all rules and orders of the department.

(2) A license issued or granted under this part and a right to possess or utilize radioactive material granted by a license issued under this part shall not be transferred, assigned, or in any manner disposed of, either voluntarily or involuntarily, directly or indirectly, through transfer of control of any license to any person unless the department, after securing full information, finds that the transfer is in accordance with the provisions of the act, and gives its consent in writing.

(3) A person licensed by the department under this part shall confine his or her use and possession of the material licensed to the locations and purposes authorized in the license.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5120 Expiration, renewal, and amendment of licenses.

Rule 120. (1) Except as provided in subrule (3) of this rule, each specific license expires at the end of the day, in the months and year stated therein.

(2) An application for renewal of a specific license shall be filed in accordance with Rule

101.

(3) If a licensee, not less than 30 days before expiration of his or her existing license, has
filed an application in proper form for renewal or for a new license authorizing the same activities, the existing license does not expire until the application has been finally determined by the department.

(4) An application for amendment of a license shall be filed in accordance with Rule 101 and shall specify the respects in which the licensee desires his or her license to be amended and the grounds for such amendment.

(5) In considering an application by a licensee to renew or amend his or her license, the department shall apply the criteria set forth in Rules 102 and 117a.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5121 Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5122 Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5123 Transfer of material.

Rule 123. (1) A licensee shall not transfer radioactive material except as authorized pursuant to this rule.

(2) Preparation for shipment and transport of radioactive material shall be in accordance with the provisions of Rule 255.

(3) A licensee may transfer radioactive material to the following:

(a) The department.

(b) The NRC.

(c) A person exempt from the rules in this part to the extent permitted under the exemption.

(d) A person authorized to receive the material under terms of a general license or its equivalent, or a specific license or equivalent licensing document, issued by the department, the NRC, or an agreement state, or to a person otherwise authorized to receive the material by the federal government or any agency thereof, the department, or an agreement state.

(e) As otherwise authorized by the department in writing.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5124 Modification, revocation, and termination of licenses.

Rule 124. (1) The terms and conditions of a license are subject to amendment, revision, or modification or the license may be suspended or revoked by reason of amendments to the act, or by reason of rules and orders issued by the department.

(2) A license may be revoked, suspended, or modified, in whole or in part, for the

following:

(a) A material false statement in the application or any statement of fact required under the act.

(b) A condition revealed by the application or statement of fact or any report, record, or inspection or other means which would warrant the department to refuse to grant a license on an original application.

(c) A violation of, or failure to observe, any of the terms and conditions of the act, the license, or any rule or order of the department.

(3) Except in a case of willfulness or where the public health, interest, or safety requires otherwise, a license shall not be modified, suspended, or revoked unless, before the institution of proceedings therefor, facts or conduct which may warrant the action have been called to the attention of the license in writing and the licensee has been accorded an opportunity to demonstrate or achieve compliance with all lawful requirements.

(4) The department may terminate a specific license upon request submitted by the licensee to the department in writing.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5125 Environmental impact report.

Rule 125. An application for a license to receive and possess radioactive material for commercial waste disposal by land burial in this state or for the conduct of any other activity which the department determines will significantly affect the quality of the environment shall be filed at least 9 months before the beginning of construction of the plant or facility in which the activity will be conducted and shall be accompanied by an environmental report. The report shall contain information similar to the information specified in Rules 212 and 238.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

RECIPROCITY

R 325.5131 General license for limited period.

Rule 131. This rule is a general license issued to a person who holds a specific license from the NRC or an agreement state issued by the agency having jurisdiction where the licensee maintains an office for directing the licensed activity and at which radiation safety records are normally maintained, to conduct the activities authorized in the license in this state for a period not in excess of 180 days in any calendar year if all of the following conditions are met:

(a) The license does not limit the activity authorized by it to specified installations or locations.

(b) The licensee notifies the department in writing at least 3 days prior to engaging in the activity. The notification shall indicate the location, period, and type of proposed possession and use within this state and shall be accompanied by a copy of the pertinent license. If, for a specific case, the 3-day period would impose an undue hardship on the licensee, he or she may obtain permission to proceed sooner upon application to the department. The department may waive

the requirement for filing additional written notifications during the remainder of the calendar year following the receipt of the initial notification from a person engaging in activities under the general license provided in this rule.

(c) The licensee complies with all applicable rules of the department and with all the terms and conditions of his or her license, except terms and conditions which may be inconsistent with applicable rules of the department.

(d) The licensee supplies such other information as the department may request.

(e) The licensee does not transfer or dispose of radioactive material possessed or used under the general license provided in this rule except by transfer to a person specifically licensed by the department or by the NRC to receive such material, or exempt from the requirements for a license for such material under Rule 65.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

Editor's Note: An obvious error in R 325.5131 was corrected at the request of the promulgating agency, pursuant to Section 56 of 1969 PA 306, as amended by 2000 PA 262, MCL 24.256. The rule containing the error was published in Michigan Register, 2016 MR 10. The memorandum requesting the correction was published in Michigan Register, 2016 MR 16.

R 325.5132 Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5133 Limited acceptance of reciprocal licenses.

Rule 133. The department may withdraw, limit, or qualify its acceptance of a specific license or equivalent licensing document issued by another agency, or any product distributed pursuant to such licensing document, upon determining that the action is necessary to prevent undue hazard to public health and safety or property.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

LICENSE FEES

R 325.5141 Application fees.

Rule 141. (1) A license application for which a fee is prescribed in Rule 144 shall be accompanied by a remittance in the full amount of the fee unless the applicant has been exempted from fee payment under Rule 143.

(2) An application will not be accepted for filing or processed before payment of the full amount specified unless exempted from fee payment. An application for which a remittance is not received may be returned to the applicant.

(3) All application fees shall be retained irrespective of the department's disposition of the application or a withdrawal of the application.

(4) The application fee serves as the license fee for the first year after issuance of the license irrespective of the time interval between date of application and date of issuance.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5142. Annual fees.

Rule 142. (1) An annual license fee is payable 1 year after the date of issuance of the license and annually thereafter.

(2) The annual fee shall be submitted in a timely manner so that its receipt is assured on or before the due date in order to maintain the license in effect.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5143 Exemptions.

Rule 143. (1) Application fees or annual fees are not required for licenses applied for by, or issued to the following:

(a) An agency of this state or any political subdivision thereof for radioactive material or accelerators to be used primarily for services rendered on a charitable basis or in connection with a facility used primarily for charitable purposes.

(b) A nonprofit educational institution for radioactive material or accelerators to be used exclusively for teaching or training purposes or in connection with a facility used exclusively for teaching or training purposes.

(2) Application fees or annual fees are not required for licenses authorizing the use of source material as shielding only in devices and containers, but all other licensed radioactive material in the device or container is subject to the fees prescribed in Rule 144 unless otherwise exempted under this rule.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5144 Fee schedule.

Rule 144. Applicants for specific radioactive material licenses and licensees issued these licenses shall pay the appropriate license fees and shall be subject to the footnotes specified in the following fee schedule unless exempted under Rule 143.

SCHEDULE OF RADIOACTIVE MATERIAL LICENSE FEES		
Category of License [1]	Application Fee [2]	Annual Fee [3] [4]
1. Radioactive Material Other than Special Nuclear, Byproduct, or Source Material:		
A. All other specific radioactive material licenses except those in categories 2A or 2B.	$50.00	$50.00
2. Waste Disposal:		
A. Waste disposal licenses specifically authorizing the receipt of waste radioactive material from other persons for the purpose of commercial disposal by the waste disposal licensee by land burial	$3,000.00	$3,000.00
B. Waste disposal licenses specifically authorizing the receipt of waste radioactive material from other persons for the purpose of commercial disposal by the waste disposal licensee by transfer to another person authorized to receive such material.	$400.00	$400.00

FOOTNOTES
to
SCHEDULE OF RADIOACTIVE MATERIAL LICENSE FEES

[1] Amendments based on applications filed after the due date of the annual license fee reducing the scope of a licensee's program or cancelling a license, will not entitle the licensee to a partial refund of an annual fee that has been paid by the licensee for the year in which such amendment or cancellation occurs. Applications for amendments increasing the scope of a program to a higher fee category will not be accepted for filing unless accompanied by the prescribed fee less the amount of the currently prescribed fee for the activities already licensed.

[2] Applications for specific licenses covering more than 1 fee category shall be accompanied by the prescribed fee for each category.

[3] Payment of the prescribed annual fee does not automatically renew the license for which the fee is paid. Renewal applications shall be filed in accordance with the requirements of Rule 120. Applications for reissuance of licenses that have expired because a timely renewal application was not filed shall be accompanied by the prescribed application fee.

[4] The annual fee will be waived where an application is filed to cancel the license prior to the due date of the annual fee, and the amount of the annual fee will be reduced where an application is filed to amend the license to reduce its scope before the due date of the annual fee. *However*, an annual fee will not be waived or reduced unless the application filed before the due date of the fee contains all the information necessary to permit the department to complete the requested action

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5145 Payment of fees.

Rule 145. (1) License fee payments shall be by check, draft, or money order payable to the "State of Michigan".

(2) In any case where the department finds that a licensee has failed to pay the applicable annual fee required in this part, the department may suspend or revoke the license or may issue such order with respect to licensed activities as the department determines to carry out these rules and the act.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

SCHEDULES A AND B

R 325.5146 Schedule A - Exempt concentrations.

Rule 146. See Rule 65.

Element (atomic number)	Radionuclide	Column I Gas concentration μCi/ml*	Column II Liquid and solid concentration μCi/ml**
Antimony (51)	Sb 122		3×10^{-4}
	Sb 124		2×10^{-4}
	Sb 125		1×10^{-3}
Argon (18)	Ar 37	1×10^{-3}	
	Ar 41	4×10^{-7}	
Arsenic (33)	As 73		5×10^{-3}
	As 74		5×10^{-4}
	As 76		2×10^{-4}
	As 77		8×10^{-4}
Barium (56)	Ba 131		2×10^{-3}
	Ba 140		3×10^{-4}
Beryllium (4)	Be 7		2×10^{-2}
Bismuth (83)	Bi 206		4×10^{-4}
Bromine (35)	Br 82	4×10^{-7}	3×10^{-3}
Cadmium (48)	Cd 109		2×10^{-3}
	Cd 115m		3×10^{-4}
	Cd 115		3×10^{-4}
Calcium (20)	Ca 45		9×10^{-5}
	Ca 47		5×10^{-4}
Carbon (6)	C 14	1×10^{-6}	8×10^{-3}
Cerium (58)	Ce 141		9×10^{-4}
	Ce 143		4×10^{-4}
	Ce 144		1×10^{-4}
Cesium (55)	Cs 131		2×10^{-2}
	Cs 134m		6×10^{-2}

Element (atomic number)	Radionuclide	Column I Gas concentration µCi/ml*	Column II Liquid and solid concentration µCi/ml**
	Cs 134		9×10^{-5}
Chlorine (17)	Cl 38	9×10^{-7}	4×10^{-3}
Chromium (24)	Cr 51		2×10^{-2}
Cobalt (27)	Co 57		5×10^{-3}
	Co 58		1×10^{-3}
	Co 60		5×10^{-4}
Copper (29)	Cu 64		3×10^{-3}
Dysprosium (66)	Dy 165		4×10^{-3}
	Dy 166		4×10^{-4}
Erbium (68)	Er 169		9×10^{-4}
	Er 171		1×10^{-3}
Europium (63)	Eu 152 ($T_{1/2}$=9.2 hrs)		6×10^{-4}
	Eu 155		2×10^{-3}
Fluorine (9)	F 18	2×10^{-6}	8×10^{-3}
Gadolinium (64)	Gd 153		2×10^{-3}
	Gd 159		8×10^{-4}
Gallium (31)	Ga 72		4×10^{-4}
Germanium (32)	Ge 71		2×10^{-2}
Gold (79)	Au 196		2×10^{-3}
	Au 198		5×10^{-4}
	Au 199		2×10^{-3}
Hafnium (72)	Hf 181		7×10^{-4}
Hydrogen (1)	H 3	5×10^{-6}	3×10^{-2}
Indium (49)	In 113m		1×10^{-2}
	In 114m		2×10^{-4}
Iodine (53)	I 126	3×10^{-9}	2×10^{-5}
	I 131	3×10^{-9}	2×10^{-5}
	I 132	8×10^{-8}	6×10^{-4}
	I 133	1×10^{-8}	7×10^{-5}
	I 134	2×10^{-7}	1×10^{-3}
Iridium (77)	Ir 190		2×10^{-3}
	Ir 192		4×10^{-4}
	Ir 194		3×10^{-4}
Iron (26)	Fe 55		8×10^{-3}
	Fe 59		6×10^{-4}
Krypton (36)	Kr 85m	1×10^{-6}	
	Kr 85	3×10^{-6}	
Lanthanum (57)	La 140		2×10^{-4}
Lead (82)	Pb 203		4×10^{-3}
Lutetium (71)	Lu 177		1×10^{-3}

Element (atomic number)	Radionuclide	Column I Gas concentration μCi/ml*	Column II Liquid and solid concentration μCi/ml**
Manganese (25)	Mn 52		3×10^{-4}
	Mn 54		1×10^{-3}
	Mn 56		1×10^{-3}
Mercury (80)	Hg 197m		2×10^{-3}
	Hg 197		3×10^{-3}
	Hg 203		2×10^{-4}
Molybdenum (42)	Mo 99		2×10^{-3}
Neodymium (60)	Nd 147		6×10^{-4}
	Nd 149		3×10^{-3}
Nickel (28)	Ni 65		1×10^{-3}
Niobium (41)	Nb 95		1×10^{-3}
	Nb 97		9×10^{-3}
Osmium (76)	Os 185		7×10^{-4}
	Os 191m		3×10^{-2}
	Os 191		2×10^{-2}
	Os 193		6×10^{-4}
Palladium (46)	Pd 103		3×10^{-3}
	Pd 109		9×10^{-4}
Phosphorous (15)	P 32		2×10^{-4}
Platinum (78)	Pt 191		1 x 10-3
	Pt 193m		1 x 10-2
	Pt 197m		1 x 10-2
	Pt 197		1 x 10-3
Polonium (84)	Po 210		7 x 10-6
Potassium (42)	K 42		3 x 10-3
Praseodymium (59)	Pr 142		3 x 10-4
	Pr 143		5 x 10-4
Promethium (61)	Pm 147		2 x 10-3
	Pm 149		4 x 10-4
Radium (88)	Ra 226		1 x 10-7
	Ra 228		3 x 10-7
Radon (86)	Rn 220	1 x 10-8	
	Rn 222	1 x 10-7	
Rhenium (75)	Re 183		6 x 10-3
	Re 186		9 x 10-4
	Re 188		6 x 10-4
Rhodium (45)	Rh 103m		1 x 10-1
	Rh 105		1 x 10-3
Rubidium (37)	Rb 86		7 x 10-4
Ruthenium (44)	Ru 97		4 x 10-3
	Ru 103		8 x 10-4
	Ru 105		1 x 10-3

Element (atomic number)	Radionuclide	Column I Gas concentration μCi/ml*	Column II Liquid and solid concentration μCi/ml**
	Ru 106		1 x 10-4
Samarium (62)	Sm 153		8 x 10-4
Scandium (21)	Sc 46		4 x 10-4
	Sc 47		9 x 10-4
	Sc 48		3 x 10-4
Selenium (34)	Se 75		3 x 10-3
Silicon (14)	Si 31		9 x 10-3
Silver (47)	Ag 105		1 x 10-3
	Ag 110m		3 x 10-4
	Ag 111		4 x 10-4
Sodium (11)	Na 24		2 x 10-3
Strontium (38)	Sr 85		1 x 10-3
	Sr 89		1 x 10-4
	Sr 91		7 x 10-4
	Sr 92		7 x 10-4
Sulfur (16)	S 35	9 x 10-8	6 x 10-4
Tantalum (73)	Ta 182		4 x 10-4
Technetium (43)	Tc 96m		1 x 10-1
	Tc 96		1 x 10-3
Tellurium (52)	Te 125m		2 x 10-3
	Te 127m		6 x 10-4
	Te 127		3 x 10-3
	Te 129m		3 x 10-4
	Te 131m		6 x 10-4
	Te 132		3 x 10-4
Terbium (65)	Tb 160		4 x 10-4
Thallium (81)	Tl 200		4 x 10-3
	Tl 201		3 x 10-3
	Tl 202		1 x 10-3
	Tl 204		1 x 10-3
Thulium (69)	Tm 170		5 x 10-4
	Tm 171		5 x 10-3
Tin (50)	Sn 113		9 x 10-4
	Sn 125		2 x 10-4
Tungsten (74)	W 181		4 x 10-3
	W 187		7 x 10-4
Vanadium (23)	V 48		3 x 10-4
Xenon (54)	Xe 131m	4 x 10-6	
	Xe 133	3 x 10-6	
	Xe 135	1 x 10-6	
Ytterbium (70)	Yb 175		1 x 10-3
Yttrium (39)	Y 90		2 x 10-4

Element (atomic number)	Radionuclide	Column I Gas concentration μCi/ml*	Column II Liquid and solid concentration μCi/ml**
	Y 91m		3 x 10-2
	Y 91		3 x 10-4
	Y 92		6 x 10-4
	Y 93		3 x 10-4
Zinc (30)	Zn 65		1 x 10-3
	Zn 69m		7 x 10-4
	Zn 69		2 x 10-2
Zirconium (40)	Zr 95		6 x 10-4
	Zr 97		2 x 10-4
Beta and/or gamma emitting radioactive material not listed above with half-life less than 3 years.		1 x 10-10	1 x 10-6

* Values are given in Column 1 only for those materials normally used as gases.

** μCi/gm for solids.

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

NOTE 2: For purposes of Rule 65 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 A for the specific nuclide when not in combination. The sum of such ratios may not exceed "1" (i.e., unity).

EXAMPLE:

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

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5147 Schedule B - Exempt quantities.

Rule 147. See Rule 74.

Radionuclide	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
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 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 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) 9.2 h	100
Europium 152 (Eu 152) 13 yr	1
Europium 154 (Eu 154)	1
Europium 155 (Eu 155)	10

Radionuclide	Microcuries
Fluorine 18 (F 18)	1,000
Gadolinium 153 (Gd 153)	10
Gadolinium 159 (Gd 159)	100
Gallium 72 (Ga 72)	10
Germanium 71 (Ge 71)	100
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 113m (In 113m)	100
Indium 114m (In 114m)	10
Indium 115m (In 115m)	100
Indium 115 (In 115)	10
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 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

Radionuclide	Microcuries
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 (Os 191)	100
Osmium 193 (Os 193)	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
Platinum 197m (Pt 197m)	100
Platinum 197 (Pt 197)	100
Polonium 210 (Po 210)	0.1
Potassium 42 (K 42)	10
Praseodymium 142 (Pr 142)	100
Praseodymium 143 (Pr 143)	100
Promethium 147 (Pm 147)	10
Promethium 149 (Pm 149)	10
Rhenium 186 (Re 186)	100
Rhenium 188 (Re 188)	100
Rhodium 103m (Rh 103m)	100
Rhodium 105 (Rh 105)	100
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 (Si 31)	100
Silver 105 (Ag 105)	10
Silver 110m (Ag 110m)	1
Silver 111 (Ag 111)	100
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
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 175 (Yb 175)	100
Yttrium 90 (Yb 90)	10
Yttrium 91 (Yb 91)	10
Yttrium 92 (Yb 92)	100
Yttrium 93 (Yb 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

Radionuclide	Microcuries
Any radionuclide not listed above other than alpha emitting radioactive material	0.1

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5148 Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.

R 325.5149. Rescinded.

History: 1979 AACS; 2016 MR 10, Eff. May 25, 2016.