

TITLE 20 ENVIRONMENTAL PROTECTION
CHAPTER 3 RADIATION PROTECTION
PART 1 GENERAL PROVISIONS

20.3.1.1 ISSUING AGENCY: Environmental Improvement Board.
[20.3.1.1 NMAC - Rp, 20.3.1.1 NMAC, 4/30/2009]

20.3.1.2 SCOPE: Except as otherwise specifically provided, this part applies to all persons who receive, possess, use, transfer, own or acquire any source of radiation; provided, however, that nothing in this part shall apply to any person to the extent that such person is subject to regulations by the NRC. Regulation by the state of source material, byproduct material and special nuclear material in quantities not sufficient to form a critical mass is subject to the provisions of the agreement between the state and the NRC and 10 CFR Part 150.
[20.3.1.2 NMAC - Rp, 20.3.1.2 NMAC, 4/30/2009]

20.3.1.3 STATUTORY AUTHORITY: Sections 74-1-9, 74-3-5 and 74-3-9 NMSA 1978.
[20.3.1.3 NMAC - Rp, 20.3.1.3 NMAC, 4/30/2009]

20.3.1.4 DURATION: Permanent.
[20.3.1.4 NMAC - Rp, 20.3.1.4 NMAC, 4/30/2009]

20.3.1.5 EFFECTIVE DATE: April 30, 2009, unless a later date is cited at the end of a section.
[20.3.1.5 NMAC - Rp, 20.3.1.5 NMAC, 4/30/2009]

20.3.1.6 OBJECTIVES:

A. To protect the public and occupationally exposed individuals from unnecessary exposure to ionizing radiation.

B. To provide for the safe possession and use of radioactive materials and radiation machines in keeping with the ALARA principle, as defined in 20.3.4.7 NMAC.
[20.3.1.6 NMAC - Rp, 20.3.1.6 NMAC, 4/30/2009]

20.3.1.7 DEFINITIONS: As used in these regulations, these terms have the definitions as set forth below.

A. "Accelerator" (See particle accelerator).

B. "Accelerator produced material" means any material made radioactive by exposure to radiation from a particle accelerator.

C. "Act" means the Radiation Protection Act (Sections 74-3-1 through 74-3-16, NMSA 1978).

D. "Agreement state" means any state with which the United States nuclear regulatory commission (NRC) or the United States atomic energy commission (AEC) has entered into an effective agreement under Section 274b of the Atomic Energy Act, as amended (73 Stat. 689).

E. "Board" means the environmental improvement board.

F. "Byproduct material" means:

(1) any radioactive material, (except special nuclear material), yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material;

(2) the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content, including discrete surface wastes resulting from uranium or thorium solution extraction processes; underground ore bodies depleted by these solution extraction operations do not constitute byproduct material within this definition;

(3) any discrete source of radium-226 that is produced, extracted or converted after extraction, before, on, or after August 8, 2005, for use for a commercial, medical or research activity;

(4) any material that:
(a) has been made radioactive by use of a particle accelerator; and
(b) is produced, extracted or converted after extraction, before, on, or after August 8, 2005, for use for a commercial, medical or research activity; or

(5) any discrete source of naturally occurring radioactive material, other than source material, that

(a) NRC, in consultation with the administrator of the environmental protection agency (EPA), the secretary of energy, the secretary of homeland security, and the head of any other appropriate

federal agency, determines would pose a threat similar to the threat posed by a discrete source of radium-226 to the public health and safety or the common defense and security; and

(b) before, on, or after August 8, 2005, is extracted or converted after extraction for use in a commercial, medical or research activity.

G. **“Calibration”** means the quantitative evaluation and adjustment, as deemed necessary by the department, of radiation measuring instruments by a department approved laboratory. Calibration includes the determination of:

(1) the response or reading of an instrument relative to a series of known radiation values over the range of the instrument; or

(2) the strength of a source of radiation relative to a standard using national institute of standards and technology (NIST) traceable sources and approved techniques.

H. **“CFR”** means code of federal regulations.

I. **“Chelating agent”** means amine polycarboxylic acids, hydroxycarboxylic acids, gluconic acid and polycarboxylic acids.

J. **“Commercial waste disposal”** means disposal of radioactive waste as a business enterprise.

K. **“Consortium”** means an association of medical use licensees and a PET radionuclide production facility in the same geographical area that jointly own or share in the operation and maintenance cost of the PET radionuclide production facility that produces PET radionuclides for use in producing radioactive drugs within the consortium for noncommercial distributions among its associated members for medical use. The PET radionuclide production facility within the consortium must be located at an educational institution or a federal facility or a medical facility.

L. **“Council”** means the radiation technical advisory council (RTAC).

M. **“Curie”** means that amount of radioactive material which disintegrates at the rate of 37 billion atoms per second.

N. **“Cyclotron”** means a particle accelerator in which the charged particles travel in an outward spiral or circular path. A cyclotron accelerates charged particles at energies usually in excess of 10 megaelectron volts and is commonly used for production of short half-life radionuclides for medical use.

O. **“Decommission”** means to remove a facility or site safely from service and reduce residual radioactivity to a level that permits:

(1) release of the property for unrestricted use and termination of the license; or

(2) release of the property under restricted conditions and termination of the license.

P. **“Department”** means the environment department, its successors, or its predecessors, the environmental improvement agency, or the environmental protection division of the environment department.

Q. **“Depleted uranium”** means the source material uranium which the isotope uranium-235 is less than 0.711 weight percent of the total uranium present. Depleted uranium does not include special nuclear material.

R. **“Discrete source”** means a radionuclide that has been processed so that its concentration within a material has been purposely increased for use for commercial, medical or research activities.

S. **“DOE”** means the United States department of energy established by the Department of Energy Organization Act (Public Law 95-91, 91 Stat. 565, 42 U.S.C. 7101 et. seq.) to the extent that the DOE, or its duly authorized representatives, exercises functions formerly vested in the United States atomic energy commission (AEC), its chairman, members, officers and components and transferred to the United States energy research and development administration (ERDA) and to the administrator thereof pursuant to sections 104(b), (c) and (d) of the Energy Reorganization Act (Public Law 93-438, 88 Stat. 1233 at 1237, 42 U.S.C. 5814) and retransferred to the secretary of energy pursuant to section 301(a) of the Department of Energy Organization Act (Public Law 95-91, 91 Stat. 565 at 577-578, 42 U.S.C. 7151).

T. **“DOT”** means the United States department of transportation.

U. **“EPA”** means the United States environmental protection agency.

V. **“FDA”** means the United States food and drug administration.

W. **“Former U.S. atomic energy commission (AEC) or NRC licensed facilities”** means nuclear reactors, nuclear fuel reprocessing plants, uranium enrichment plants or critical mass experimental facilities where AEC or NRC licenses have been terminated.

X. **“Government agency”** means any state or federal executive department, commission, independent establishment, corporation, wholly or partly owned by any state or the United States of America which is an instrumentality of the state or United States, or any board, bureau, division, service, office, officer, authority, administration or other establishment in the executive branch of the government.

Y. **“Hazardous waste”** means those wastes designated as hazardous by EPA regulations in 40 CFR

Part 261.

Z. “Healing arts” means those professional disciplines authorized by the laws of this state to use x-rays or radioactive material in the diagnosis or treatment of human or animal disease.

AA. “Human use” means the internal or external administration of radiation or radioactive material to human beings for the purpose of medical diagnosis or therapy.

BB. “Individual” means any human being.

CC. “Inspection” means an official examination or observation including, but not limited to, tests, surveys and monitoring to determine compliance with rules, regulations, orders, requirements and license or registration conditions of the department.

DD. “License” means a license issued by the department in accordance with 20.3 NMAC.

EE. “Licensed material” means radioactive material received, possessed, used, transferred or disposed of under a general or specific license issued by the department.

FF. “Licensee” means the holder of a license.

GG. “Licensing state” means any state with regulations equivalent to the suggested state regulations for control of radiation (SSRCR) relating to, and an effective program for, the regulatory control of NARM (as defined in 20.3.1.7 NMAC) and which has been granted final designation by the conference of radiation control program directors, incorporated (CRCPD).

HH. “Lost or missing licensed material” means licensed material whose location is unknown. This definition includes, but is not limited to, material that has been shipped but has not reached its planned destination and whose location cannot be readily traced in the transportation system.

II. “Major processor” means a user processing, handling or manufacturing radioactive material exceeding type A quantities as unsealed sources or material, or exceeding four times type B quantities as sealed sources, but does not include nuclear medicine programs, universities, industrial radiographers or small industrial programs. Type A and B quantities are defined in 10 CFR Part 71.4.

JJ. “Mixed waste” contains both hazardous waste (as defined by Resource Conservation and Recovery Act (RCRA) and its amendments) and radioactive waste (as defined by Atomic Energy Act (AEA) and its amendments). It is jointly regulated by NRC or NRC's agreement states and EPA or EPA's RCRA authorized states. The fundamental and most comprehensive statutory definition is found in the Federal Facilities Compliance Act (FFCA) where Section 1004(41) was added to RCRA: “The term 'mixed waste' means waste that contains both hazardous waste and source, special nuclear, or byproduct material subject to the Atomic Energy Act.”

KK. “NARM” means any naturally occurring or accelerator-produced radioactive material. It does not include source or special nuclear material.

LL. “Natural radioactivity” means radioactivity of naturally occurring nuclides.

MM. “NRC” means the United States nuclear regulatory commission or its duly authorized representatives.

NN. “Ore refineries” means all processors of a radioactive material ore including uranium mills or other source material extraction facilities.

OO. “Particle accelerator” (accelerator) means any machine capable of accelerating electrons, protons, deuterons or other charged particles in a vacuum and of discharging the resultant particulate or other radiation into a medium at energies usually in excess of 1 megaelectron volt. For purposes of this definition, “accelerator” is an equivalent term. Particle accelerators which intentionally produce radioactive materials or produce radioactive materials incidental to the operation of an accelerator shall be subject to the licensing requirements in 20.3.3 NMAC. Particle accelerators which produce radiation for research, diagnostic or therapeutic purposes shall be subject to the registration requirements in 20.3.2 and 20.3.9 NMAC.

PP. “Person” means:

(1) any individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, government agency other than NRC or DOE, any state or any political subdivision of or any political entity within a state, any foreign government or nation or any political subdivision of any such government or nation, or other entity; and

(2) any legal successor, representative, agent or agency of the foregoing.

QQ. “PET” means positron emission tomography.

RR. “Qualified expert” means an individual having the knowledge and training to measure ionizing radiation, to evaluate safety techniques, and to advise regarding radiation protection needs; for example, individuals certified in the appropriate field by the American board of radiology (ABR), or the American board of health physics (ABHP), or the American board of medical physics (ABMP) or those having equivalent qualifications. With reference to the calibration of radiation therapy equipment, an individual having, in addition to the above

1 qualifications, training and experience in the clinical applications of radiation physics to radiation therapy; for
2 example, individuals certified in therapeutic radiological physics or x-ray and radium physics by the ABR, or those
3 having equivalent qualifications. With reference to providing medical physics services to certified mammographic
4 facilities, such individuals must meet the requirements as defined by the FDA.

5 **SS. “Radiation”** (ionizing radiation), as used in this chapter, means alpha particles, beta particles,
6 gamma rays, x-rays, neutrons, high-speed electrons, high-speed protons and other particles capable of producing
7 ions. Radiation, as used in this chapter, does not include non-ionizing radiation, such as radiowaves or microwaves,
8 visible, infrared or ultraviolet light.

9 **TT. “Radiation machine”** means any device capable of producing radiation except those devices with
10 radioactive material as the only source of radiation.

11 **UU. “Radiation safety officer”** means one who has the knowledge and responsibility to apply
12 appropriate radiation protection regulations.

13 **VV. “Radioactive material”** means any material in any physical or chemical form which emits
14 radiation spontaneously.

15 **WW. “Radioactivity”** means the transformation of unstable atomic nuclei by the emission of radiation.

16 **XX. “Radioisotope”** (see radioactive material).

17 **YY. “Radionuclide”** (see radioactive material).

18 **ZZ. “Registrant”** means a holder of a registration and any person who is registered or legally
19 obligated to register with the department pursuant to 20.3.2 NMAC or 20.3.9 NMAC.

20 **AAA. “Registration”** (certificate of registration) means a registration issued by the department pursuant
21 to 20.3.2 NMAC or 20.3.9 NMAC.

22 **BBB. “Regulation”** means any rule adopted pursuant to the act.

23 **CCC. “Regulations of the U.S. department of transportation” (DOT)** means the regulations in 49
24 CFR Parts 100-185.

25 **DDD. “Research and development”** means:

26 (1) theoretical analysis, exploration or experimentation; or
27 (2) the extension of investigative findings and theories of a scientific or technical nature into
28 practical application for experimental and demonstration purposes, including the experimental production and
29 testing of models, devices, equipment, materials and processes. Research and development does not include the
30 internal or external administration of radiation or radioactive material to human beings.

31 **EEE. “Sealed source”** means any radioactive material that is encased in a capsule designed to prevent
32 leakage or escape of the radioactive material.

33 **FFF. “Sealed source and device registry”** means the national registry that contains all the registration
34 certificates, generated by both NRC and the agreement states that summarize the radiation safety information for the
35 sealed sources and devices and describe the licensing and use conditions approved for the product.

36 **GGG. “Secretary”** means the secretary of the New Mexico environment department.

37 **HHH. “SI”** means the international system of units.

38 **III. “Site boundary”** means that line beyond which the land or property is not owned, leased or
39 otherwise controlled by the licensee or registrant.

40 **JJJ. “Source material”** means:

41 (1) uranium or thorium, or any combination thereof, in any physical or chemical form; or
42 (2) ores that contain by weight one-twentieth of one percent (0.05 percent) or more of
43 uranium, thorium or any combination thereof; source material does not include special nuclear material.

44 **KKK. “Source material milling”** means any activity which results in the production of byproduct as
45 defined in Paragraph (2) of Subsection F of this section.

46 **LLL. “Source of radiation”** means any radioactive material, device or equipment emitting or capable
47 of producing radiation.

48 **MMM. “Special form radioactive material”** means radioactive material that satisfies the conditions in
49 10 CFR 71.75

50 **NNN. “Special nuclear material”** means:

51 (1) plutonium, uranium-233, uranium enriched in the isotope 233 or in the isotope 235, and
52 any other material which the NRC, pursuant to the provisions of Section 51 of the Atomic Energy Act determines to
53 be special nuclear material, but does not include source material; or

54 (2) any material artificially enriched by any of the foregoing but does not include source
55 material.

56 **OOO. “Special nuclear material in quantities not sufficient to form a critical mass”** means uranium

enriched in the isotope U-235 in quantities not exceeding 350 grams of contained U-235; uranium-233 in quantities not exceeding 200 grams; plutonium in quantities not exceeding 200 grams or any combination of them in accordance with the following formula: for each kind of special nuclear material, determine the ratio between the quantity of that special nuclear material and the quantity specified above for the same kind of special nuclear material. The sum of such ratios for all of the kinds of special nuclear material in combination shall not exceed 1 (i.e. unity). For example, the following quantities in combination would not exceed the limitation and are within the formula: $175 \text{ (grams contained U-235)} / 350 + 50 \text{ (grams U-233)} / 200 + 50 \text{ (grams Pu)} / 200 = 1$.

PPP. "Test" means a method for determining the characteristics of conditions of sources of radiation or components thereof.

QQQ. "These regulations" means all parts of 20.3 NMAC.

RRR. "Unrefined and unprocessed ore" means ore in its natural form prior to any processing such as grinding, roasting, beneficiating or refining.

SSS. "Waste" (radioactive waste) means those low-level radioactive wastes containing radioactive material which is acceptable for disposal in a land disposal facility. For the purposes of this chapter, excluded from the definition of "waste" are:

(1) high-level radioactive waste or spent nuclear fuel as defined in section 2 of the Nuclear Waste Policy Act;

(2) transuranic waste as defined in section 11.(ee) of the Atomic Energy Act; or

(3) byproduct material as defined in Paragraphs (2), (3), (4) and (5) of the definition of byproduct material set forth in this section.

[20.3.1.7 NMAC - Rp, 20.3.1.7 NMAC, 4/30/2009; A, 6/13/2017; A, 8/10/2021]

20.3.1.8 PROHIBITED ACTIVITY AND CREDIBLE EVIDENCE

A. Failure to comply with the radiation protection standards, monitoring, recordkeeping, reporting or other requirements of Title 20, Chapter 3 within the timeframes specified shall constitute a violation subject to enforcement action under the Radiation Protection Act, Chapter 74, Article 3, NMSA 1978, Sections 74-3-1 to -16 .

B. If credible evidence or information obtained by the department or provided to the department by a third party indicates that a source of radiation is not in compliance with the provisions of Title 20, Chapter 3, that evidence or information may be used by the department for purposes of establishing whether a person has violated or is in violation of Title 20, Chapter 3.

[20.3.1.8 NMAC – N XX,XX,XXXX]

20.3.1.9 through 20.3.1.106 NMAC [RESERVED]

20.3.1.107 EXEMPTIONS FROM THE REGULATORY REQUIREMENTS:

A. General Provisions. The department may, upon application of any interested person or upon its own initiative, grant such exemptions from the requirements of this chapter as it determines are authorized by law, will not endanger public health and safety or property and are otherwise in the public interest.

B. DOE contractors and NRC contractors. Any DOE contractor or subcontractor and any NRC contractor or subcontractor of the following categories operating within this state is exempt from these regulations to the extent that such contractor or subcontractor under his contract receives, possesses, uses, transfers or acquires sources of radiation:

(1) prime contractors performing work for the DOE at United States government-owned or controlled sites, including the transportation of sources of radiation to or from such sites and the performance of contract services during temporary interruptions of such transportation;

(2) prime contractors of the DOE performing research in, or development, manufacture, storage, testing or transportation of atomic weapons or components thereof;

(3) prime contractors of the DOE using or operating nuclear reactors or other nuclear devices in a United States government-owned vehicle or vessel; and

(4) any other prime contractor or subcontractor of the DOE or NRC when the state and the NRC jointly determine:

(a) that the exemption of the prime contractor or subcontractor is authorized by law; and

(b) that, under the terms of the contract or subcontract, there is adequate assurance that the work thereunder can be accomplished without undue risk to the public health and safety.

C. Common and contract carriers, freight forwarders, warehousemen and United States postal service

are exempt from the regulations in 10 CFR parts 31 through 37 and 39 as well as the requirements for a license set forth in section 81 of the Atomic Energy Act to the extent that they transport or store byproduct material in the regular course of carriage for another or storage incident thereto.

D. Mining, extracting, processing, storage or transportation of radioactive ores or uranium concentrates that are regulated by the mine safety and health administration (MSHA), United States department of labor (DOL), or any other federal or state agency having authority are exempt unless the authority is ceded by such agency to the board.

[20.3.1.107 NMAC - Rp, 20.3.1.107 NMAC, 4/30/2009; A, 6/13/2017]

20.3.1.108 RECORDS: Each licensee and registrant shall maintain records showing the receipt, transfer and disposal of all sources of radiation. Additional record requirements are specified elsewhere in these regulations.

[20.3.1.108 NMAC - Rp, 20.3.1.108 NMAC, 4/30/2009]

20.3.1.109 INSPECTIONS:

A. Each licensee and registrant shall afford the department at all reasonable times, opportunity to inspect sources of radiation and the premises and facilities wherein such sources of radiation are used or stored.

B. Each licensee and registrant shall make available to the department for inspection upon reasonable notice, records maintained pursuant to the requirements in this chapter.

[20.3.1.109 NMAC - Rp, 20.3.1.109 NMAC, 4/30/2009]

20.3.1.110 TESTS: Each licensee and registrant shall perform, or permit the department to perform such tests as the department deems appropriate or necessary for the administration of the requirements in this chapter, including, but not limited to, tests of:

A. sources of radiation;

B. facilities wherein sources of radiation are used or stored;

C. radiation detection and monitoring instruments; and

D. other equipment and devices used in connection with utilization or storage of sources of radiation.

[20.3.1.110 NMAC - Rp, 20.3.1.110 NMAC, 4/30/2009]

20.3.1.111 ADDITIONAL REQUIREMENTS: The department may impose upon a licensee or registrant such requirements in addition to those established in this chapter as it deems appropriate or necessary to minimize danger to public health and safety or property.

[20.3.1.111 NMAC - Rp, 20.3.1.111 NMAC, 4/30/2009]

20.3.1.112 VIOLATIONS:

A. Violation of any requirement of the act, this chapter or a license or registration condition may result in enforcement proceedings under Section 74-3-11.1, NMSA 1978, including, but not limited to, the following:

(1) issuing a compliance order or assessing a civil penalty of up to \$ 15,000 per day for each violation or both; or

(2) commencing a civil action in district court for appropriate relief, including injunctive relief.

B. A person who knowingly commits a violation of any provision of the act, this chapter or order issued thereunder may be guilty of a misdemeanor under Section 74-3-12.1, NMSA 1978. A person who knowingly makes a false statement, representation or certification in an application, record, report, plan or other document filed or required to be maintained pursuant to the act or this chapter may be guilty of a petty misdemeanor under Section 74-3-12.1, NMSA 1978.

[20.3.1.112 NMAC - Rp, 20.3.1.112 NMAC, 4/30/2009]

20.3.1.113 IMPOUNDING: Sources of radiation shall be subject to impounding pursuant to the act.

[20.3.1.113 NMAC - Rp, 20.3.1.113 NMAC, 4/30/2009]

20.3.1.114 PROHIBITED USES:

A. A hand-held fluoroscopic screen shall not be used with x-ray equipment unless it has been listed in the *registry of sealed sources and devices* or accepted for certification by the FDA, or the center for devices and radiological health (CDRH).

1 **B.** A shoe-fitting fluoroscopic device shall not be used.

2 **C.** The use of a source of radiation for the purpose of screening or inspecting individuals for

3 concealed weapons, hazardous materials, stolen property, illegal goods or contraband, is prohibited without prior

4 written approval from the department.

5 **D.** The exposure of any individual to the primary beam of a radiation machine for training or

6 demonstration purposes is prohibited.

7 [20.3.1.114 NMAC - Rp, 20.3.1.114 NMAC, 4/30/2009]

8

9 **20.3.1.115 INTERPRETATIONS:** Except as specifically authorized by the department in writing, no

10 interpretation of these regulations by an officer or employee of the department other than a written interpretation by

11 the legal counsel will be recognized to be binding upon the department.

12 [20.3.1.115 NMAC - Rp, 20.3.1.115 NMAC, 4/30/2009]

13

14 **20.3.1.116 COMMUNICATIONS:** All communications and reports concerning these regulations and

15 applications filed thereunder should be addressed to the department at its office as follows: New Mexico

16 environment department, radiation control bureau, P.O. Box 5469, Santa Fe, NM 87502-5469.

17 [20.3.1.116 NMAC - Rp, 20.3.1.116 NMAC, 4/30/2009; A, 7/20/2021]

18

19 **20.3.1.117 through 20.3.1.120 [RESERVED]**

20

21 **20.3.1.121 DOCUMENTS AND FORMS:**

22 **A.** All documents referenced in these regulations are available for review at the offices of the

23 department's radiation control bureau.

24 **B.** All forms referenced in these regulations may be obtained for review at the offices of the

25 department's radiation control bureau.

26 [20.3.1.121 NMAC - Rp, 20.3.1. 121 NMAC, 4/30/2009]

27

28 **20.3.1.122 DELIBERATE MISCONDUCT:**

29 **A.** Any licensee, registrant, applicant for a license or registration, employee of a licensee, employee

30 of a registrant or registration applicant; or any contractor (including a supplier or consultant), subcontractor,

31 employee of a contractor or subcontractor of any licensee or registrant or applicant for a license or registration, who

32 knowingly provides to any licensee, registrant, applicant, contractor, or subcontractor, any components, equipment,

33 materials, or other goods or services that relate to a licensee's, registrant's or applicant's activities in 20.3 NMAC,

34 may not:

35 (1) engage in deliberate misconduct that causes or would have caused, if not detected, a

36 licensee, registrant, or applicant to be in violation of any rule, regulation, or order; or any term, condition, or

37 limitation of any license or registration issued by the department; or

38 (2) deliberately submit to the department, a licensee, registrant, an applicant, or a licensee's,

39 registrant's or applicant's, contractor or subcontractor, information that the person submitting the information knows

40 to be incomplete or inaccurate in some respect material to the department.

41 **B.** A person who violates Paragraphs (1) or (2) of Subsection A of this section may be subject to

42 enforcement action in accordance with all applicable provisions of the act and 20.3 NMAC.

43 **C.** For the purposes of Paragraph (1) of Subsection A of this section, deliberate misconduct by a

44 person means an intentional act or omission that the person knows:

45 (1) would cause a licensee, registrant or applicant to be in violation of any rule, regulation, or

46 order; or any term, condition, or limitation, of any license or registration issued by the department; or

47 (2) constitutes a violation of a requirement, procedure, instruction, contract, purchase order

48 or policy of a licensee, registrant, applicant, contractor or subcontractor.

49 [20.3.1.122 NMAC - Rp, 20.3.1.122 NMAC, 4/30/2009]

50

51 **20.3.1.123 COMPLETENESS AND ACCURACY OF INFORMATION:**

52 **A.** Information provided to the department by an applicant for a license or registration, or by a

53 licensee or registrant or information required by statute or by the department's regulations, orders, or license or

54 registration conditions to be maintained by the applicant or the licensee or registrant shall be complete and accurate

55 in all material respects.

56 **B.** Each applicant, licensee or registrant shall notify the department of information identified by the

1 applicant, licensee or registrant as having for the regulated activity a significant implication for public health and
2 safety. An applicant, licensee or registrant violates this paragraph only if the applicant, licensee or registrant fails to
3 notify the department of information that the applicant, licensee or registrant has identified as having a significant
4 implication for public health and safety. Notification shall be provided to the department within two working days
5 of identifying the information. This requirement is not applicable to information which is already required to be
6 provided to the department by other reporting or updating requirements.

7 [20.3.1.123 NMAC - N, 4/30/2009]
8

9 **20.3.1.124 SAVING CLAUSE:** Amendment and supersession of this chapter shall not affect any
10 administrative or judicial enforcement action pending on the effective date of such amendment nor the validity of
11 any license or registration issued pursuant to this chapter.

12 [20.3.1.124 NMAC - N, 4/30/2009]
13

14 **HISTORY of 20.3.1 NMAC:**

15 **Pre-NMAC History:** The material in this part was derived from that previously filed as follows:

16 EIB 73-2, Regulations for Governing the Health and Environmental Aspects of Radiation filed on 7/9/1973;

17 EIB 73-2, Amendment 1, Regulations for Governing the Health and Environmental Aspects of Radiation filed on
18 4/17/1978;

19 EIB RPR-1, Radiation Protection Regulations filed on 4/21/1980;

20 EIB RPR-1, Amendment 1, Radiation Protection Regulations filed on 10/13/1981;

21 EIB RPR-1, Amendment 2, Radiation Protection Regulations filed on 12/15/1982; and

22 EIB RPR-1, Radiation Protection Regulations filed on 3/10/1989.
23

24 **History of Repealed Material:** 20.3.1 NMAC, General Provisions (filed 3/15/2004) repealed 4/30/2009.
25

26 **Other History:** EIB RPR 1, Radiation Protection Regulations (filed 3/10/1989) renumbered and reformatted to 20
27 NMAC 3.1, Radioactive Materials and Radiation Machines, effective 5/3/1995;

28 20 NMAC 3.1, Radioactive Materials and Radiation Machines (filed 4/3/1995) internally renumbered, reformatted
29 and replaced by 20 NMAC 3.1, Radioactive Materials and Radiation Machines, effective 7/30/1999.

30 20 NMAC 3.1.Subpart 1, General (filed 6/17/1999) reformatted, amended and replaced by 20.3.1 NMAC, General
31 Provisions, effective 4/15/2004.

32 20.3.1 NMAC, General Provisions (filed 3/15/2004) replaced by 20.3.1 NMAC, General Provisions, effective
33 4/30/2009.

TITLE 20 ENVIRONMENTAL PROTECTION
CHAPTER 3 RADIATION PROTECTION
PART 2 REGISTRATION OF RADIATION MACHINES AND SERVICES

20.3.2.1 ISSUING AGENCY: Environmental Improvement Board.
[5/3/95; Recompiled 11/27/01]

20.3.2.2 SCOPE: This ~~[subpart] Part~~ ~~[[now 20.3.2 NMAC]]~~ provides for the registration of ~~[:]~~
~~[A.] ionizing radiation machine[s] facilities, persons providing radiation machine installation,~~
~~servicing, services and healthcare professionals. [; and]~~
~~[B.] persons providing radiation machine installation, servicing, or services as stipulated in Section~~
~~204.]~~

~~[C.]~~ In addition to the requirements of this ~~[subpart]~~ ~~[[now part]]~~ Part, all registrants are subject to the
applicable provisions of ~~[other subparts of these regulations]~~ 20.3.1 NMAC, 20.3.4 NMAC, and 20.3.10 NMAC. In
addition, some registrants that are licensees are subject to provisions of 20.3.5 NMAC, 20.3.6 NMAC, 20.3.8
NMAC, and 20.3.9 NMAC.
[[5/3/95; Recompiled 11/27/01] 20.3.2.1 NMAC – Rp 20.3.2.1 NMAC, xx/xx/2026]

20.3.2.3 STATUTORY AUTHORITY: Sections 74-1-8(A)(5), 74-1-9, 74-3-5 and 74-3-9 NMSA 1978.
[[5/3/95; Recompiled 11/27/01] 20.3.2.1 NMAC – Rp 20.3.2.1 NMAC, xx/xx/2026]

20.3.2.4 DURATION: Permanent.
[[5/3/95; Recompiled 11/27/01] 20.3.2.1 NMAC – Rp 20.3.2.1 NMAC, xx/xx/2026]

20.3.2.5 EFFECTIVE DATE: Effective ~~[[May 3, 1995]]~~ , 2026, unless a later date is cited at
the end of a section or paragraph. ~~[, this part, less Subpart 14 [now 20.3.14 NMAC], superseded EIB RPR 1,~~
~~Radiation Protection Regulations, filed March 10, 1989. Any reference to EIB RPR 1 on any other regulations shall~~
~~be construed to mean these regulations. Effective July 30, 1999, this part has been internally renumbered and history~~
~~notes have been added for inclusion into the New Mexico Administrative Code.~~

~~A. Subpart 14 [now 20.3.14 NMAC] is effective August 2, 1995.~~

~~B. Supersession of EIB RPR 1 shall not affect any administrative or judicial enforcement action~~
~~pending on the effective date of these regulations, nor the validity of any license issued pursuant to EIB RPR 1.]~~

[[5/3/95; Recompiled 11/27/01] 20.3.2.1 NMAC – Rp 20.3.2.1 NMAC, xx/xx/2026]

[[Compiler's note: The words *or paragraph*, above, are no longer applicable. Later dates are now cited only at the
end of sections, in the history notes appearing in brackets.]

20.3.2.6 OBJECTIVE:

A. To protect the public and occupationally exposed individuals from unnecessary exposure to
ionizing radiation.

B. To provide for the safe possession and use of radioactive materials and radiation machines in
keeping with the ALARA principle.

[[5/3/95; Recompiled 11/27/01] 20.3.2.1 NMAC – Rp 20.3.2.1 NMAC, xx/xx/2026]

20.3.2.7 DEFINITIONS: [[RESERVED]]

A. "Facility" means the location, building, vehicle, or complex under one administrative control at
which one or more radiation machines are installed, located, or used.

B. "Storage" means a condition in which a device or source is not being used for an extended period
and has been made inoperable.

[20.3.2.1 NMAC – Rp 20.3.2.1 NMAC, xx/xx/2026]

20.3.2.8 - 20.3.2.199 [RESERVED]

20.3.2.200 PROHIBITION: All registrants shall prohibit any person from providing radiation machine
servicing or services as described in Subsection D of 20.3.2.204 NMAC; to their radiation machine facility until
such person provides evidence of registration with the Department as a provider of services in accordance with
20.3.2.204 NMAC

1 ~~[[5/3/95; Recompiled 11/27/01]] 20.3.2.1 NMAC – Rp 20.3.2.1 NMAC, xx/xx/2026]~~
2

3 **20.3.2.201 EXEMPTIONS:**

4 **A.** Electronic equipment that produces radiation incidental to its operation for other purposes is
5 exempt from the registration and notification requirements of this ~~[subpart [now part]]~~ Part, provided that the dose
6 equivalent rate averaged over an area of 10 sq. cm does not exceed 0.5 mrem (5 µSv) per hour at 5 cm from an
7 accessible surface of such equipment. The production, testing or factory servicing of such equipment shall not be
8 exempt.

9 **B.** Radiation machines while in transit or storage incident thereto are exempt from the requirements
10 of this ~~[subpart [now part]]~~ Part.

11 **C.** Domestic television receivers are exempt from the requirements of this subpart ~~[subpart [now~~
12 ~~part]]~~ Part.

13 **D.** Microwave ovens in private homes are exempt from the requirements of this ~~[subpart [now part]]~~
14 Part.

15 ~~[[5/3/95; Recompiled 11/27/01]] 20.3.2.1 NMAC – Rp 20.3.2.1 NMAC, xx/xx/2026]~~
16

17 **20.3.2.202 APPLICATION FOR REGISTRATION OF RADIATION MACHINES:**

18 **A.** Each person having a radiation machine shall:

19 **(1).** apply for registration of such ~~[machine]~~ facility with the department ~~[within 30 days~~
20 ~~following the effective date of these regulations or thereafter]~~ prior to the operation of a radiation machine on forms
21 furnished by the department and shall contain all the information required by the form and accompanying
22 instructions; and

23 **(2).** designate on the application form an individual to be responsible for radiation protection.
24 **B.** A practitioner, licensed by the respective state board of examiners (i.e. state medical board, state
25 dental board, state chiropractic board, state podiatric board), responsible for directing the operation of radiation
26 machines shall be designated on each healing arts application. The signature of the administrator, president, or chief
27 executive officer will be accepted in lieu of a licensed practitioner's signature if the facility has more than one
28 licensed practitioner (for example, hospitals, large clinics, or multi-practitioner practices).

29 **C.** Mobile facilities with radiation producing machines shall maintain documentation required by this
30 Part on site.

31 ~~[[5/3/95; Recompiled 11/27/01]] 20.3.2.1 NMAC – Rp 20.3.2.1 NMAC, xx/xx/2026]~~
32

33 **20.3.2.203 [PROHIBITED SERVICING OF RADIATION MACHINES:** Each registrant shall prohibit
34 any person from furnishing radiation machine servicing or services as described in Section 204.D ~~[now Subsection~~
35 ~~D of 20.3.2.204 NMAC]~~ to their radiation machine facility until the person provides evidence that they have been
36 registered with the department as a provider of services in accordance with Section 204.]

37 **SHIELDING PLAN REVIEW:**

38 **A.** Before construction, the department may require the submittal of the floor plans, shielding
39 specifications, and equipment arrangement of all new installations or modifications of existing installations utilizing
40 ionizing radiation machines for review and approval. The required information is in Appendices A and B of this
41 Part.

42 **B.** The department may require the applicant to utilize the services of a qualified health physicist or a
43 qualified medical physicist to determine the shielding requirements before the department's plan review and
44 approval.

45 **C.** The department's approval of such plans shall not preclude the requirement of additional
46 modifications should a subsequent analysis of operating conditions indicate the possibility of an individual receiving
47 a dose above the limits prescribed in Part 4 of 20.3.4.405, and 20.3.4.410 thru 20.3.4.414 NMAC, of these
48 regulations.

49 **D.** After installation of a radiation machine, the registrant shall maintain the following for inspection
50 by the department:

51 **(1)** The maximum rated technique factors of each machine; and

52 **(2)** A scale drawing of the room in which a stationary radiation machine system is located
53 with such drawing indicating the use of areas adjacent to the room and an estimation of the extent of occupancy by
54 an individual in such areas. In addition, the drawing shall include:

55 **(a)** The results of a survey for radiation levels present at the operator's position and
56 at pertinent points outside the room at specified test conditions; or

1 (b) The type and thickness of materials, or lead equivalency, of each protective
2 barrier.
3 ~~[[5/3/95; Recompile 11/27/01]~~ 20.3.2.1 NMAC – Rp 20.3.2.1 NMAC, xx/xx/2026]

4
5 **20.3.2.204 APPLICATION FOR REGISTRATION OF SERVICING AND SERVICES:**

6 A. Each person who is engaged in the business of installing or offering to install radiation machines
7 or is engaged in the business of furnishing or offering to furnish radiation machine servicing or radiation safety
8 related services in this state, shall apply for registration of such services with the department prior to furnishing or
9 offering to furnish any such services.

10 B. Application for registration shall be completed on a form furnished by the department and shall
11 contain all information required by the department as indicated on the forms and accompanying instructions.

12 C. Each person applying for registration under this ~~[subpart [now part]]~~ Part shall specify:
13 (1) that they have read and understand the requirements of these regulations; ~~[and]~~
14 (2) the services for which they are applying for registration; and
15 (3) the training and experience that qualifies them to discharge the services for which they
16 are applying for registration.

17 D. For the purpose of this Section [204], services may include, but shall not be limited to:

- 18 (1) installation or servicing of radiation machines and associated radiation machine
19 components;
20 (2) calibration of radiation machines or radiation measurement instruments or devices;
21 (3) radiation protection or health physics consultations or surveys; and
22 (4) personnel dosimetry services.

23 E. Personnel dosimetry services shall obligate themselves to report to the department all exposures
24 greater than 400 millirems (4000 µSv) in any one month within 10 days of the determination.

25 F. No individual shall perform services which are not specifically indicated by that individual on his
26 application for registration.

27 ~~[[5/3/95; Recompile 11/27/01]~~ 20.3.2.1 NMAC – Rp 20.3.2.1 NMAC, xx/xx/2026]

28
29
30 **20.3.2.205 ISSUANCE OF REGISTRATION CERTIFICATES:**

31 A. Upon a determination that an applicant meets the requirements of these regulations, the
32 department shall issue a registration certificate.

33 B. The department may incorporate in the registration certificate at the time of issuance or thereafter
34 by appropriate rule or order, such additional requirements and conditions with respect to the registrant's receipt,
35 possession, use and transfer of radiation machines as it deems appropriate or necessary to protect the health of the
36 people of this state.

37 ~~[[5/3/95; Recompile 11/27/01]~~ 20.3.2.1 NMAC – Rp 20.3.2.1 NMAC, xx/xx/2026]

38
39 **20.3.2.206 EXPIRATION OF REGISTRATION CERTIFICATES:** Except as provided by Section 207,
40 of this Part each registration certificate shall expire at the end of the day on the date stated therein.

41 [5/3/95; Recompile 11/27/01]

42
43 **20.3.2.207 RENEWAL OF NOTICE OF REGISTRATION:**

44 A. Application for renewal of registration shall be filed at least 30 calendar days before the current
45 certificate expires and in accordance with Sections 202 or 204 of this Part.

46 B. ~~[In any case in which a registrant not less than 30 days prior to the expiration of [his] their existing~~
47 ~~registration certificate has filed an application in proper form for renewal, such existing registration certificate shall~~
48 ~~not expire until the application status has been finally determined by the department.]~~ Registrations expire the
49 following business day after the date noted on the registration.

50 ~~[[5/3/95; Recompile 11/27/01]~~ 20.3.2.1 NMAC – Rp 20.3.2.1 NMAC, xx/xx/2026]

51
52 **20.3.2.208 REPORT OF CHANGES:** The registrant shall notify the department, in writing, before making
53 any change which would render the information contained in the application for registration or the registration
54 certificate no longer accurate.

55 ~~[[5/3/95; Recompile 11/27/01]~~ 20.3.2.1 NMAC – Rp 20.3.2.1 NMAC, xx/xx/2026]

20.3.2.209 APPROVAL NOT IMPLIED: No person, in any advertisement, shall refer to the fact that they or their facility is registered with the department pursuant to the provisions of Sections 202 or 204 of this Part and no person shall state or imply that any activity under such registration has been approved by the department.
[[5/3/95; Recompiled 11/27/01] 20.3.2.1 NMAC – Rp 20.3.2.1 NMAC, xx/xx/2026]

20.3.2.210 ASSEMBLER OR TRANSFER OBLIGATION:

A. Any person who sells, leases, transfers, lends, disposes, assembles or installs radiation machines in this state shall notify the department within 15 calendar days of:

- (1) the name and address of persons who have received these machines;
- (2) the manufacturer, model and serial number of each radiation machine transferred; and
- (3) the date of transfer of each radiation machine.

B. No person shall make, sell, lease, transfer, lend, assemble or install radiation machines or the supplies used in connection with such machines unless such supplies and equipment, when properly placed in operation and used, shall meet the requirements of these regulations.

[[5/3/95; Recompiled 11/27/01] 20.3.2.1 NMAC – Rp 20.3.2.1 NMAC, xx/xx/2026]

20.3.2.211 OUT-OF-STATE RADIATION MACHINES:

A. Whenever any radiation machine is to be brought into the state, for any temporary use, the person proposing to bring such machine into the state shall give written notice to the department at least two working days before such machine is to be used in the state. The notice shall include: ~~[the type of radiation machines; the nature, duration and scope of use; and the exact location(s) where the radiation machine is to be used. If for a specific case, the two working day period would impose an undue hardship on the person, they may, upon application to the department, obtain permission to proceed sooner.]~~

- (1) the type of radiation machines
- (2) the nature, duration, and scope of use;
- (3) the exact location(s) where the radiation, machine is to be used; and
- (4) the State in which this machine is registered.

B. In addition, the out-of-state person shall:
(1) comply with all applicable regulations;
(2) supply the department with such other information as the department may reasonably request; and
(3) not operate within this state on a temporary basis, in excess of 180 calendar days per year.

[[5/3/95; Recompiled 11/27/01] 20.3.2.1 NMAC – Rp 20.3.2.1 NMAC, xx/xx/2026]

20.3.2.212 QUALIFICATION OF HEALTH PHYSICISTS AND MEDICAL PHYSICISTS FOR REGISTRATION:

A. All persons registered or licensed to provide health physics services shall be:
(1) certified by the American Board of Health Physics in the appropriate fields or specialties in which services are provided; or

(2) hold a masters or doctorate degree in physics, medical physics, other physical science, engineering, or applied mathematics from an accredited college or university; and

(3) have forty (40) hours practical training and/or supervised experience in x-ray physics.

B. All persons registered or licensed to provide medical physics services shall be certified by at least one of the following organizations in the appropriate fields or specialties in which services are provided:

(1) the American Board of Medical Physics;

(2) the American Board of Radiology;

(3) the American Board of Science in Nuclear Medicine; or

(4) similar board accredited by the Commission on Accreditation of Medical Physics Education Programs.

C. Medical physicists for mammography shall meet the requirements specified by the Mammography Quality Standards Act of 1992, Public Law 102-539, 42 U.S.C. 263b, and 21 C.F.R. Part 900.

D. Medical physicists involved with facilities using radioactive materials on humans shall meet the requirements of Part 7 of 20.3 NMAC for registration or licensure.

E. All surveys, audits, reports, or other work performed by a health physicist or medical physicist as required by 20.3 NMAC shall be reviewed and signed by a health physicist or medical physicist holding registration or licensure specified by this Part.
[NMAC – Rp 20.3.2.1 NMAC, xx/xx/2026]

20.3.2.213 APPENDIX A. INFORMATION ON RADIATION SHIELDING REQUIRED FOR PLAN REVIEWS:

A. In order for the department to provide evaluation, technical advice and official approval on shielding requirements for a radiation installation, the following information is needed:

(1) normal location of the radiation producing equipment's radiation port; port's travel and traverse limits; general direction(s) of the radiation beam; locations of all windows; locations of the operator's booth; location of the equipment's control console; distance from x-ray tube to nearest primary barrier;

(2) structural composition and thickness of all walls, doors, partitions, floor(s) and ceiling(s) of room(s) concerned;

(3) height, floor-to-floor, of room(s) concerned;

(4) type of occupancy of all adjacent areas, inclusive of space above and below the room(s) concerned; for exterior walls, distance to the closest existing occupied area(s);

(5) kVp (kilovolt peak potential) and maximum mA (milliamperage) for each radiation machine; and

(6) type of examination(s) or treatment(s) performed with equipment (e.g., dental, orthodontal, chest, gastrointestinal, fluoroscopic, podiatry, fixed therapy, rotational therapy, etc.).

B. Information on anticipated workload used in shielding calculations must be provided. This must include exposures per week and average duration of each exposure for each radiation machine number.

C. If services of a qualified radiation expert have been utilized, a copy of his report shall be submitted with plans. This report must show all basic assumptions (i.e., workload, occupancy and use factors, distance, etc.) used to determine the shielding requirements.

[[5/3/95; Recompiled 11/27/01]-20.3.2.1 NMAC – Rp 20.3.2.1 NMAC, xx/xx/2026]

20.3.2.214 APPENDIX B: MINIMUM DESIGN REQUIREMENTS FOR AN X-RAY MACHINE OPERATOR'S BOOTH:

A. Space requirements:

(1) The operator shall be allotted not less than 0.7 square m (7.5 square feet) of unobstructed floor space in the booth;

(2) The minimum space as indicated in Paragraph (1) of Subsection (A) of this Section may be any geometric configuration with no dimension of less than 61 cm (2 feet);

(3) The space shall be allotted excluding any encumbrance by the console, such as overhang or cables, or other similar encroachments;

(4) The booth shall be located or constructed such that unattenuated direct scatter radiation originating on the examination table or at the wall cassette not reach the operator's station in the booth;

(5) The booth walls shall be at least 2.1 m (7 feet) high, and shall be permanently fixed to the floor or other structure as may be necessary; and

(6) When a door or movable panel is used as an integral part of the booth structure, it must have a permissive device which will prevent an exposure when the door or panel is not closed (this type of booth structure is not recommended).

B. Switch placement:

(1) The operator's switch for the radiographic machine shall be fixed within the booth;

(2) The switch shall be at least 1 m (40 inches) from any edge of the booth wall which is proximal to the examining table; and

(3) The switch shall allow the operator to use the majority of the available viewing windows.

C. Viewing system requirements:

(1) Each booth shall have at least one viewing device which will:

(a) be placed so the operator can view the patient during any exposure; and

(b) be placed so the operator can have full view of any occupant of the room and should be placed so the operator can view any entry into the room and if any door, which allows access to the room cannot be seen from the booth, then that door must have a permissive device controlling the exposure which will prevent the exposure if the door is not closed.

(2) When the viewing system is a window:
(a) it shall have a visible area of at least 930 square cm (1.5 square feet);
(b) the distance between the proximal edge of the window and the open edge of the booth shall not be less than 45.7 cm (18 inches); and
(c) the glass shall have the same lead equivalence as that required in the booths' wall in which it is to be mounted.
(3) When the viewing system is by mirrors, the mirror(s) shall be so located as to accomplish the general requirements Paragraph C of this Section
(4) When the viewing system is by electronic means (e.g., TV, etc.):
(a) the camera shall be so located as to accomplish the general requirements of Paragraph C of this Section; and
(b) there shall be an alternative viewing system as a backup for electronic failure.
[[5/3/95; Recompiled 11/27/01]-20.3.2.1 NMAC – Rp 20.3.2.1 NMAC, xx/xx/2026]

20.3.2.215 APPENDIX C. RADIATION SAFETY OFFICER (RSO) REQUIREMENTS

A. All RSOs shall meet the following general requirements in addition to requirements in specific categories, except for industrial radiography RSOs:

(1) Knowledge of potential radiation hazards and emergency precautions; and
(2) Completed educational courses related to ionizing radiation safety or a radiation safety officer course; or
(3) Experience in the use and familiarity of the type of equipment used.
B. Specific requirements for RSOs by facility are as follows.

(1) Healing arts facilities shall have:
(a) Licensed practitioner RSOs with documentation of licensing board number; or
(b) Non-practitioner RSOs with the following:
(i) Evidence of a state license in medical radiologic technology and at least two years of supervised use of radiation machines; or
(ii) Evidence of registry by the American Registry of Radiologic Technologists (ARRT) and at least two years of supervised use of radiation machines; or
(iii) Evidence of associate degree in radiologic technology, health physics, or nuclear technology, and at least two years of supervised use of radiation machines; or
(iv) Evidence of:
(1) At least four years of supervised use of radiation machines in the respective practitioners' specialty; or
(2) A bachelor's (or higher) degree in a natural or physical science, health physics, radiological science, nuclear medicine, or nuclear engineering; or
(3) A current state license in medical physics or board certification in health or medical physics and in accordance with 20.3.2.212 NMAC, as applicable, for radiotherapy facilities.

(2) Academic institutions and/or research and development facilities shall have RSOs who are faculty or staff members in radiation protection, radiation engineering, or related disciplines. (This individual may also serve as the RSO over the healing arts section of the facility.)
[20.3.2.1 NMAC – Rp 20.3.2.1 NMAC, xx/xx/2026]

20.3.2.216 APPENDIX D. RESPONSIBILITIES OF RADIATION SAFETY OFFICERS (RSO):

Specific duties of the RSO include, but are not limited to, the following:

A. Establishing and overseeing operating and safety procedures that maintain radiation exposures as low as reasonably achievable (ALARA), and to review them regularly to ensure that the procedures are current and conform with this chapter;

B. Ensuring that individual monitoring devices are properly used by occupationally-exposed personnel, that records are kept of the monitoring results, and that timely notifications are made as required by Part 4;

C. Investigating and reporting to the Department each known or suspected case of radiation exposure to an individual or radiation level detected in excess of limits established by this chapter and each theft or loss of source(s) of radiation, determining the cause, and taking steps to prevent its recurrence;

- 1 **D.** Having a thorough knowledge of management policies and administrative procedures of the
2 registrant and keeping management informed on a periodic basis of the performance of the registrant's radiation
3 protection program, if applicable;
4 **E.** Assuming control and having the authority to institute corrective actions including shut-down of
5 operations when necessary in emergency situations or unsafe conditions;
6 **F.** Maintaining records as required by this chapter; and
7 **G.** Ensuring that personnel are adequately trained and complying with this chapter, the conditions of
8 the certificate of registration, and the operating and safety procedures of the registrant.
9 [20.3.2.1 NMAC – Rp 20.3.2.1 NMAC, xx/xx/2026]

10
11 **20.3.2.217 - 20.3.2.200 [RESERVED]**

12
13 **HISTORY OF 20.3.2 NMAC:**

14 Pre-NMAC History: The material in this part was derived from that previously filed as follows: EIB 73-2,
15 Regulations for Governing the Health and Environmental Aspects of Radiation filed on 7/9/73; EIB 73-2,
16 Amendment 1, Regulations for Governing the Health and Environmental Aspects of Radiation filed on 4/17/78; EIB
17 RPR-1, Radiation Protection Regulations filed on 4/21/80; EIB RPR-1, Amendment 1, Radiation Protection
18 Regulations filed on 10/13/81; EIB RPR-1, Amendment 2, Radiation Protection Regulations filed on 12/15/82; and
19 EIB RPR-1, Radiation Protection Regulations filed on 3/10/89.

20
21 History of Repealed Material: **[RESERVED]**

22
23 Other History: EIB RPR 1, Radiation Protection Regulations, filed 3/10/89 renumbered and reformatted to 20
24 NMAC 3.1, Radiation Materials and Radiation Machines, filed 4/3/95. 20 NMAC 3.1, Radiation Materials and
25 Radiation Machines, filed 6/17/99 internally renumbered and reformatted replaced 20 NMAC 3.1, filed 4/3/95. The
26 material in this part was derived from that previously filed as: 20 NMAC 3.1.Subpart 2, Registration of Radiation
27 Machines and Services, filed 6/17/99 recompiled as 20.3.2 NMAC, effective 11/27/01.
28

TITLE 20 ENVIRONMENTAL PROTECTION
CHAPTER 3 RADIATION PROTECTION
PART 3 LICENSING OF RADIOACTIVE MATERIAL

20.3.3.1 ISSUING AGENCY: Environmental Improvement Board.
[20.3.3.1 NMAC - Rp, 20.3.3.1 NMAC, 4/30/2009]

20.3.3.2 SCOPE:

A. This part provides for the licensing of radioactive material. Except for persons exempt as provided in this part, no person shall manufacture, produce, receive, possess, use, own, transfer or acquire radioactive material except as authorized in a specific or general license issued pursuant to the requirements in this part.

B. In addition to the requirements of this part, all licensees are subject to the requirements of 20.3.1 NMAC, 20.3.4 NMAC, 20.3.10 NMAC and 20.3.16 NMAC.

C. The requirements of this part are in addition to, and not in substitution for, other requirements of this chapter. In any conflict between a requirement in this part and a specific requirement in another part of this chapter, the specific requirement governs.
[20.3.3.2 NMAC - Rp, 20.3.3.2 NMAC, 4/30/2009]

20.3.3.3 STATUTORY AUTHORITY: Sections 74-1-8(A)(5), 74-1-9, 74-3-5 and 74-3-9 NMSA 1978.
[20.3.3.3 NMAC - Rp, 20.3.3.3 NMAC, 4/30/2009 ; A, XX/XX/2026]

20.3.3.4 DURATION: Permanent.

[20.3.3.4 NMAC - Rp, 20.3.3.4 NMAC, 4/30/2009]

20.3.3.5 EFFECTIVE DATE: ~~April 30, 2009~~ XX/XX/2026, unless a later date is cited at the end of a section.

[20.3.3.5 NMAC - Rp, 20.3.3.5 NMAC, 4/30/2009; A, XX/XX/2026]

20.3.3.6 OBJECTIVE: This part sets forth rules applicable to all persons in the state of New Mexico governing licensing of radioactive material under the act, and exemptions from the licensing requirements.
[20.3.3.6 NMAC - Rp, 20.3.3.6 NMAC, 4/30/2009]

20.3.3.7 DEFINITIONS:

A. “Alert” means events that may occur, are in progress, or have occurred that could lead to a release of radioactive material but that the release is not expected to require a response by offsite response organizations to protect persons offsite.

B. “Principal activities” means activities authorized by the license which are essential to achieving the purpose(s) for which the license was issued or amended. Storage during which no licensed material is accessed for use or disposal and activities incidental to decontamination or decommissioning are not principal activities.

C. “Site area emergency” means events that may occur, are in progress, or have occurred that could lead to a significant release of radioactive material and that could require a response by offsite response organizations to protect persons offsite.

D. “Indian Tribe” means an Indian or Alaska native Tribe, band, nation, pueblo, village, or community that the secretary of the interior acknowledges to exist as an Indian Tribe pursuant to the Federally Recognized Indian Tribe List Act of 1994, 25 U.S.C. 479a.

E. “Tribal official” means the highest ranking individual that represents Tribe leadership, such as the chief, president, or Tribal council leadership.

F. “Unrefined and unprocessed ore” means ore in its natural form prior to any processing, such as grinding, roasting or beneficiating, or refining. Processing does not include sieving or encapsulation of ore or preparation of samples for laboratory analysis.

[20.3.3.7 NMAC - N, 04/30/2009; A, 06/13/2017; A, 8/10/2021]

20.3.3.8 to 20.3.3.300 [RESERVED]

20.3.3.301 EXEMPTIONS - UNIMPORTANT QUANTITIES OF SOURCE MATERIAL:

1 **A.** Any person is exempt from the requirements in this part to the extent that such person receives,
2 possesses, uses, transfers or delivers source material in any chemical mixture, compound, solution or alloy in which
3 the source material is by weight less than one twentieth of one percent of the mixture, compound, solution or alloy.
4 The exemption contained in this subsection does not include *byproduct material* as defined in Paragraph (2) of
5 Subsection F of 20.3.1.7 NMAC.

6 **B.** Any person is exempt from the requirements in this part to the extent that such person receives,
7 possesses, uses or transfers unrefined and unprocessed ore containing source material; provided that, except as
8 authorized in a specific license, such person shall not refine or process such ore.

9 **C.** Any person is exempt from the requirements for a license set forth in the Radiation Protection Act,
10 NMSA 1978, Sections 74-3-1 through 16 and from the regulations in this part and in 10 CFR Parts 19, 20, and 21 to
11 the extent that such person receives, possesses, uses or transfers:

- 12 (1) any quantities of thorium contained in:
 - 13 (a) incandescent gas mantles;
 - 14 (b) vacuum tubes;
 - 15 (c) welding rods;
 - 16 (d) electric lamps for illuminating purposes; provided, that each lamp does not
17 contain more than 50 milligrams of thorium;
 - 18 (e) germicidal lamps, sunlamps, and lamps for outdoor or industrial lighting;
19 provided, that each lamp does not contain more than two grams of thorium;
 - 20 (f) rare earth metals and compounds, mixtures and products containing not more
21 than one fourth of one percent by weight, thorium, uranium or any combination of these; or
 - 22 (g) personnel neutron dosimeters; provided, that each dosimeter does not contain
23 more than 50 milligrams of thorium;
- 24 (2) source material contained in the following products:
 - 25 (a) glazed ceramic tableware manufactured before August 27, 2013, provided that
26 the glaze does not contain more than twenty percent by weight source material;
 - 27 (b) glassware, containing not more than two percent by weight source material or,
28 for glassware manufactured before August 27, 2013, ten percent by weight source material; but not including
29 commercially manufactured glass brick, pane glass, ceramic tile or other glass, glass enamel or ceramic used in
30 construction;
 - 31 (c) glass enamel or glass enamel frit containing not more than ten percent by weight
32 source material imported or ordered for importation into the United States, or initially distributed by manufacturers
33 in the United States, before July 25, 1983 (On July 25, 1983, the exemption of glass enamel frit was suspended. The
34 exemption was eliminated on September 11, 1984); or
 - 35 (d) piezoelectric ceramic containing not more than two percent by weight source
36 material;
- 37 (3) photographic film, negatives and prints containing uranium or thorium;
- 38 (4) any finished product or part fabricated of, or containing, tungsten or magnesium-thorium
39 alloys, provided that the thorium content of the alloy does not exceed four percent by weight and that this exemption
40 shall not be deemed to authorize the chemical, physical or metallurgical treatment or processing of any such product
41 or part;
- 42 (5) uranium contained in counterweights installed in aircraft, rockets, projectiles and
43 missiles, or stored or handled in connection with installation or removal of such counterweights; provided, that:
 - 44 (a) each counterweight has been impressed with the following legend clearly legible
45 through any plating or other covering: "depleted uranium." (the requirements specified in Subparagraphs (a) and (b)
46 of this paragraph need not be met by counterweights manufactured prior to December 31, 1969; provided, that such
47 counterweights are impressed with the legend, "caution - radioactive material - uranium");
 - 48 (b) each counterweight is durably and legibly labeled or marked with the
49 identification of the manufacturer and the statement: "unauthorized alterations prohibited"; (the requirements
50 specified in Subparagraphs (a) and (b) of this paragraph need not be met by counterweights manufactured prior to
51 December 31, 1969; provided, that such counterweights are impressed with the legend, "caution - radioactive
52 material - uranium");
 - 53 (c) the exemption contained in this paragraph shall not be deemed to authorize the
54 chemical, physical or metallurgical treatment or processing of such counterweights other than repair or restoration of
55 any plating or other covering; and
 - 56 (d) consistent with 10 CFR 40.56, the counterweights are not manufactured for

1 military purpose using Australian-obligated source material;

2 (6) natural or depleted uranium metal used as shielding constituting part of any shipping
3 container which is conspicuously and legibly impressed with the legend, "caution - radioactive shielding - uranium"
4 and the uranium metal is encased in mild steel or equally fire resistant metal of minimum wall thickness of one-
5 eighth of an inch (3.2 millimeters);

6 (7) thorium or uranium contained in or on finished optical lenses and mirrors, provided that
7 each lens or mirror does not contain more than ten percent by weight of thorium or uranium or, for lenses
8 manufactured before August 27, 2013, thirty percent by weight of thorium; and that the exemption contained in this
9 paragraph does not authorize either:

10 (a) the shaping, grinding or polishing of such lens or mirror or manufacturing
11 processes other than the assembly of such lens or mirror into optical systems and devices without any alternation of
12 the lens; or

13 (b) the receipt, possession, use or transfer of uranium or thorium contained in
14 contact lenses, spectacles, eyepieces in binoculars or other optical instruments;

15 (8) uranium contained in detector heads for use in fire detection units, provided that each
16 detector head contains not more than 0.005 microcurie of uranium; or

17 (9) thorium contained in any finished aircraft engine part containing nickel-thoria alloy,
18 provided, that:

19 (a) the thorium is dispersed in the nickel-thoria alloy in the form of finely divided
20 thoria (thorium-dioxide); and

21 (b) the thorium content in the nickel-thoria alloy does not exceed four percent by
22 weight.

23 **D.** No person may initially transfer for sale or distribution a product containing source material to
24 persons exempt in accordance with 10 CFR 40.13(c), or equivalent regulations of an agreement state, unless
25 authorized by a license issued pursuant to 10 CFR 40.52 to initially transfer such products for sale or distribution.

26 (1) Persons initially distributing source material in products covered by the exemptions in
27 this paragraph 10 CFR 40.13(c) before August 27, 2013, without specific authorization may continue such
28 distribution for 1 year beyond this date. Initial distribution may also be continued until the NRC commission takes
29 final action on a pending application for license or license amendment to specifically authorize distribution
30 submitted no later than 1 year beyond this date.

31 (2) Persons authorized to manufacture, process, or produce these materials or products
32 containing source material by an agreement state, and persons who import finished products of parts, for sale or
33 distribution must be authorized by a license issued pursuant to 10 CFR 40.52 for distribution only and are exempt
34 from the requirements of 10 CFR 19 and 10 CFR 20, and 10 CFR 40.32(b) and (c).

35 **E.** The exemptions in Subsection C of this section do not authorize the manufacture of any of the
36 products described.

37 [20.3.3.301 NMAC - Rp, 20.3.3.301 NMAC, 4/30/2009; A, 8/10/2021]

38 [Editorial Note:

39 ¹On July 25, 1983, the exemption of glass enamel or glass enamel frit was suspended. The exemption was
40 eliminated on September 11, 1984.

41 ²The requirements specified in Subsection C(5)(a) and (b) of this section need not be met by counterweights
42 manufactured prior to Dec. 31, 1969, provided that such counterweights were manufactured under a specific license
43 issued by the atomic energy commission and were impressed with the legend required by 10 CFR 40.13(c)(5)(ii) in
44 effect on June 30, 1969.]

46 **20.3.3.302 EXEMPTIONS - RADIOACTIVE MATERIAL OTHER THAN SOURCE MATERIAL:**

47 **A. Exempt concentrations.**

48 (1) Except as provided in Paragraphs (3) and (4) of this subsection, any person is exempt
49 from the license requirements in this part to the extent that such person receives, possesses, uses, transfers, owns or
50 acquires products or materials containing radioactive material in concentrations not in excess of those listed in
51 20.3.3.329 NMAC.

52 (2) This subsection shall not be deemed to authorize the import of radioactive material or
53 products containing radioactive material.

54 (3) A manufacturer, processor or producer of a product or material is exempt from the
55 license requirements in this part to the extent that they transfer radioactive material contained in a product or
56 material in concentrations not in excess of those specified in 20.3.3.329 NMAC and introduced into the product or

material by a licensee holding a specific license issued by the NRC expressly authorizing such introduction. This exemption does not apply to the transfer of radioactive material contained in any food, beverage, cosmetic, drug or other commodity or product designed for ingestion or inhalation by, or application to, a human being.

(4) 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 subsection or equivalent regulations of the NRC or an agreement state, except in accordance with a specific license issued pursuant to Paragraph (1) of Subsection A of 20.3.3.315 NMAC.

B. Exempt quantities.

(1) Except as provided in Paragraphs (3) through (5) of this subsection, any person is exempt from the license requirements in this part to the extent that such person receives, possesses, uses, transfers, owns or acquires radioactive material in individual quantities each of which does not exceed the applicable quantity set forth in 20.3.3.330 NMAC.

(2) Any person who possesses byproduct material received or acquired prior to September 25, 1971 under the general license then provided in 10 CFR 31.4 or similar general license of an agreement state, is exempt from the requirements for a license set forth in this part to the extent that such person possesses, uses, transfers or owns byproduct material.

(3) This subsection does not authorize for the purposes of commercial distribution the production, packaging, repackaging or transfer of radioactive material or the incorporation of radioactive material into products intended for commercial distribution.

(4) No person may, for purposes of commercial distribution, transfer radioactive material in the individual quantities set forth in 20.3.3.330 NMAC, knowing or having reason to believe that such quantities of radioactive material will be transferred to persons exempt under this subsection or equivalent regulations of the NRC or an agreement state, except in accordance with a specific license issued by the NRC pursuant to 10 CFR 32.18 which license states that the radioactive material may be transferred by the licensee to persons exempt under this subsection or the equivalent regulations of the NRC or an agreement state.

(5) No person may, for purposes of producing an increased radiation level, combine quantities of radioactive material covered by this exemption so that the aggregate quantity exceed the limits set forth in 20.3.3.330 NMAC, except for radioactive material combined within a device placed in use before May 3, 1999, or as otherwise permitted by the rules in this chapter.

C. Exempt items.

(1) **Certain items containing radioactive material.** Any person who desires to apply byproduct material to, or to incorporate byproduct material into, the products exempted in this paragraph, or who desires to initially transfer for sale or distribution such products containing byproduct material, shall apply for a specific license to NRC pursuant to 10 CFR 32.14, which license states that the product may be distributed by the licensee to persons exempt from the regulations pursuant to this paragraph or equivalent NRC or agreement state regulations. Except for persons who apply radioactive material to, or persons who incorporate radioactive material into, the following products, or persons who initially transfer for sale or distribution (specifically licensed by NRC pursuant to 10 CFR 32.14) the following products containing radioactive material, any person is exempt from the license requirements in this part to the extent that such person receives, possesses, uses, transfers, owns or acquires the following products:

(a) timepieces or 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 (925 megabecquerels) of tritium per timepiece;

(ii) 5 millicuries (185 megabecquerels) of tritium per hand;

(iii) 15 millicuries (555 megabecquerels) of tritium per dial (bezels when used shall be considered as part of the dial);

(iv) 100 microcuries (3.7 megabecquerels) of promethium-147 per watch hand or 200 microcuries (7.4 megabecquerels) of promethium-147 per any other timepiece;

(v) 20 microcuries (0.74 megabecquerel) of promethium-147 per watch hand or 40 microcuries (1.48 megabecquerels) of promethium-147 per other timepiece hand;

(vi) 60 microcuries (2.22 megabecquerels) of promethium-147 per watch dial or 120 microcuries (4.44 megabecquerels) 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 shall not exceed, when measured through 50 milligrams per square centimeter of absorber: 1) for wrist watches, 0.1 millirad (1 milligray) per hour at 10 centimeters from any surface; 2) for pocket watches, 0.1 millirad (1 milligray)

per hour at 1 centimeter from any surface; or 3) for any other timepiece, 0.2 millirad (2 milligray) per hour at 10 centimeters from any surface; or

(viii) 1 microcurie (37 kilobecquerels) of radium-226 per timepiece in intact timepieces manufactured prior to November 30, 2007;

(b) Static elimination device. Devices designed for use as static eliminators which contain, as a sealed source or sources, byproduct material consisting of a total of not more than 500 microcuries (18.5 megabecquerels) of polonium-210 per device.

(c) Ion generating tube. Devices designed for ionization of air which contain, as a sealed source or sources, byproduct material consisting of a total of not more than 500 microcuries (18.5 megabecquerels) of polonium-210 per device or a total of not more than 50 millicuries (1.85 gigabecquerels) of hydrogen-3 (tritium) per device.

(d) precision balances containing not more than 1 millicurie (37 megabecquerels) of tritium per balance or not more than 0.5 millicurie (18.5 megabecquerels) of tritium per balance part manufactured before December 17, 2007;

(e) [RESERVED];

(f) marine compasses containing not more than 750 millicuries (27.8 gigabecquerels) of tritium gas and other marine navigational instruments containing not more than 250 millicuries (9.25 gigabecquerels) of tritium gas manufactured before December 17, 2007;

(g) ionization chamber smoke detectors containing not more than 1 microcurie (37 kilobecquerels) of americium-241 per detector in the form of a foil and designed to protect life and property from fires;

(h) electron tubes; provided, that each tube does not contain more than one of the following specified quantities of radioactive material (for purposes of this exemption, "electron tubes" include spark gap tubes, power tubes, gas tubes including glow lamps, receiving tubes, microwaves tubes, indicator tubes, pick-up tubes, radiation detection tubes and any other completely sealed tube that is designed to conduct or control electrical currents):

(i) 150 millicuries (5.55 gigabecquerels) of tritium per microwave receiver protector tube or 10 millicuries (370 megabecquerels) of tritium per any other electron tube;

(ii) 1 microcurie (37 kilobecquerels) of cobalt-60;

(iii) 5 microcuries (185 kilobecquerels) of nickel-63;

(iv) 30 microcuries (1.11 megabecquerels) of krypton-85;

(v) 5 microcuries (185 kilobecquerels) of cesium-137;

(vi) 30 microcuries (1.11 megabecquerels) of promethium-147; and

provided further, that the levels of radiation from each electron tube containing radioactive materials do not exceed 1 millirad (10 milligray) per hour at 1 centimeter from any surface when measured through 7 milligrams per square centimeter of absorber; and

(i) ionizing radiation measuring instruments containing, for purposes of internal calibration or standardization, one or more sources of radioactive material; provided, that:

(i) each source contains no more than one exempt quantity set forth in 20.3.3.330 NMAC;

(ii) each instrument contains no more than ten exempt quantities; for this requirement, an instrument's source(s) may contain either one type or different types of radionuclides and an individual exempt quantity may be composed of fractional parts of one or more of the exempt quantities in 20.3.3.330 NMAC provided that the sum of such fractions shall not exceed unity; and

(iii) for purposes of this subparagraph, 0.05 microcurie (1.85 kilobecquerels) of americium-241 is considered an exempt quantity under 20.3.3.330 NMAC.

(2) Self-luminous products containing tritium, krypton-85, promethium-147 or radium-226.

(a) Except for persons who manufacture, process, produce, or initially transfer for sale or distribution self-luminous products containing tritium, krypton-85, promethium-147 or radium-226, and except as provided in Subparagraph (c) of this paragraph, any person is exempt from the license requirements in this part to the extent that such person receives, possesses, uses, transfers, owns or acquires tritium, krypton-85, promethium-147 or radium-226 in self-luminous products manufactured, processed, produced or initially transferred in accordance with a specific license issued by the NRC pursuant to 10 CFR 32.22 which license authorizes the initial transfer of the product for use under this paragraph.

(b) Any person who desires to manufacture, process or produce, or initially transfer

for sale or distribution self-luminous products containing tritium, krypton-85 or promethium-147 for use pursuant to Subparagraph (a) of this paragraph, shall apply to NRC for a license pursuant to 10 CFR 32.22, and for a certificate of registration in accordance with 10 CFR 32.210.

(c) The exemption in this paragraph does not apply to tritium, krypton-85, promethium-147 or radium-226 used in products primarily for frivolous purposes or in toys or adornments.

(3) **Radium-226 acquired previously.** Any person is exempt from the licensing requirements in this part to the extent that such person possesses, uses or transfers, articles containing less than 0.1 microcurie (3.7 kilobecquerels) of radium-226 which were acquired prior to May 3, 1995 (the date when these rules were codified).

(4) **Gas and aerosol detectors containing radioactive material.**

(a) Except for persons who manufacture, process, produce or initially transfer for sale or distribution gas and aerosol detectors containing byproduct material, any person is exempt from the licensing requirements in this part to the extent that such person receives, possesses, uses, transfers, owns or acquires byproduct material, in gas and aerosol detectors designed to protect life or property, and manufactured, processed, produced or initially transferred in accordance with a specific license issued by the NRC, pursuant to 10 CFR 32.26, which license authorizes the initial transfer of the product for use under this paragraph. This exemption also covers gas and aerosol detectors manufactured or distributed before November 30, 2007 in accordance with a specific license issued by the department, agreement state or non-agreement state under comparable provisions to 10 CFR 32.26 authorizing distribution to persons exempt from regulatory requirements.

(b) Any person who desires to manufacture, process or produce gas and aerosol detectors containing byproduct material, or to initially transfer such products for use pursuant to Subparagraph (a) of this paragraph, shall apply for a license to the NRC pursuant to 10 CFR 32.26 and for a certificate of registration in accordance with 10 CFR 32.210.

(5) **Certain industrial devices.**

(a) Except for persons who manufacture, process, produce, or initially transfer for sale or distribution industrial devices containing byproduct 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 set forth in section 81 of the Atomic Energy Act of 1954, as amended and from the regulations in 10 CFR parts 19, 20, 21, 30 through 36, and 39 to the extent that such person receives, possesses, uses, transfers, owns, or acquires byproduct 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 issued under 10 CFR 32.30 of this chapter, which license authorizes the initial transfer of the device for use under this section. This exemption does not cover sources not incorporated into a device, such as calibration and reference sources.

(b) Any person who desires to manufacture, process, produce, or initially transfer for sale or distribution industrial devices containing byproduct material for use under subparagraph (a) of this paragraph, should apply for a license under 10 CFR 32.30 and for a certificate of registration in accordance with 10 CFR 32.210.

D. Radioactive drug - capsules containing carbon-14 urea for “in vivo” diagnostic use for humans.

(1) Except as provided in Paragraphs (2) and (3) of this subsection, any person is exempt from the requirements for a license set forth in this part and 20.3.7 NMAC provided that such person receives, possesses, uses, transfers, owns or acquires capsules containing 1microcurie (37 kilobecquerels) carbon-14 urea (allowing for nominal variation that may occur during the manufacturing process) each, for “in vivo” diagnostic use for humans.

(2) Any person who desires to use the capsules for research involving human subjects shall apply for and receive a specific license pursuant to 20.3.7 NMAC.

(3) Any person who desires to manufacture, prepare, process, produce, package, repackage or transfer for commercial distribution such capsules shall apply for and receive a specific license by NRC pursuant to 10 CFR 32.21.

(4) Nothing in this section relieves persons from complying with applicable FDA, other federal and state requirements governing receipt, administration and use of drugs.
[20.3.3.302 NMAC - Rp, 20.3.3.302 NMAC, 4/30/2009; A, 6/30/2011; A, 8/10/2021]

20.3.3.303 TYPES OF LICENSES: Licenses for radioactive materials are of two types: general and

specific.

A. General License. A general license is provided by regulation, grants authority to a person for certain activities involving radioactive material, and is effective without the filing of an application with the department or the issuance of a licensing document to a particular person. However, registration with the department may be required by the particular general license.

B. Specific License. A specific license is issued by the department to a named person who has filed an application for the license under the specific licensing provisions of 20.3.3 NMAC, 20.3.5 NMAC, 20.3.7 NMAC, 20.3.12 NMAC, 20.3.13 NMAC, 20.3.14 NMAC and 20.3.15 NMAC.
[20.3.3.303 NMAC - Rp, 20.3.3.303 NMAC, 4/30/2009]

20.3.3.304 GENERAL LICENSES - SOURCE MATERIAL:

A. General license to receive title to source material or byproduct material (as defined in Paragraph (2) of Subsection F of 20.3.1.7 NMAC). A general license is hereby issued authorizing the receipt of title to source material or byproduct material (as defined in Paragraph (2) of Subsection F of 20.3.1.7 NMAC) without regard to quantity. This general license does not authorize any person to receive, possess, deliver, use or transfer source material or byproduct material (as defined in Paragraph (2) of Subsection F of 20.3.1.7 NMAC).

B. Small quantities of source material.
A general license is hereby issued authorizing commercial and industrial firms; research, educational, and medical institutions; and federal, state, and local government agencies to receive, possess, use, and transfer uranium and thorium, in their natural isotopic concentrations and in the form of depleted uranium, for research, development, educational, commercial, or operational purposes in the following forms and quantities:

(1) No more than 1.5 kg (3.3 lb) of uranium and thorium in dispersible forms (e.g., gaseous, liquid, powder, etc.) at any one time. Any material processed by the general licensee that alters the chemical or physical form of the material containing source material must be accounted for as a dispersible form. A person authorized to possess, use, and transfer source material under Subsection B of this section may not receive more than a total of 7 kg (15.4 lb) of uranium and thorium in any one calendar year. Persons possessing source material in excess of these limits as of August 27, 2013, may continue to possess up to 7 kg (15.4 lb) of uranium and thorium at any one time for one year beyond this date, or until the department takes final action on a pending application submitted on or before August 27, 2014, for a specific license for such material and receive up to 70 kg (154 lb) of uranium or thorium in any one calendar year until December 31, 2014, or until the department takes final action on a pending application submitted on or before August 27, 2014, for a specific license for such material; and

(2) No more than a total of 7 kg (15.4 lb) of uranium and thorium at any one time. A person authorized to possess, use, and transfer source material under Subsection B of this section may not receive more than a total of 70 kg (154 lb) of uranium and thorium in any one calendar year. A person may not alter the chemical or physical form of the source material possessed under this paragraph unless it is accounted for under the limits of Subsection B(1) of this section; or

(3) No more than 7 kg (15.4 lb) of uranium, removed during the treatment of drinking water, at any one time. A person may not remove more than 70 kg (154 lb) of uranium from drinking water during a calendar year under Subsection B of this section; or

(4) No more than 7 kg (15.4 lb) of uranium and thorium at laboratories for the purpose of determining the concentration of uranium and thorium contained within the material being analyzed at any one time. A person authorized to possess, use, and transfer source material under Subsection B of this section may not receive more than a total of 70 kg (154 lb) of source material in any one calendar year.

C. Any person who receives, possess, uses, or transfers source material pursuant to the general license in Subsection B of this section:

(1) is prohibited from administering source material, or the radiation therefrom, either externally or internally, to human beings except as may be authorized by the department in a specific license;

(2) shall not abandon such source material. Source material may be disposed of as follows:
(a) A cumulative total of 0.5 kg (1.1 lb) of source material in a solid, non-dispersible form may be transferred each calendar year, by a person authorized to receive, possess, use, and transfer source material under a general license to persons receiving the material for permanent disposal.

(b) The recipient of source material transferred under the provisions of this section is exempt from the requirements to obtain a license under this part to the extent the source material is permanently disposed. This provision does not apply to any person who is in possession of source material under a specific license issued under this chapter or in accordance with 20.3.4.433 NMAC.

(3) is subject to the provisions in accordance with 10 CFR 40.1 through 40.10, 10 CFR 40.41(a) through (e), 10 CFR 40.46, 10 CFR 40.51, 10 CFR 40.56, 10 CFR 40.60 through 40.63, 10 CFR 40.71, 10 CFR 40.81, and the equivalent regulations in 20.3.3 NMAC; and

(4) shall not export such source material except in accordance with 10 CFR 110.

D. Any person who receives, possesses, uses, or transfers source material in accordance with subsection B of this section shall conduct activities so as to minimize contamination of the facility and the environment. When activities involving such source material are permanently ceased at any site, if evidence of significant contamination is identified, the general licensee shall notify the department by an appropriate method listed in 20.3.1.116 NMAC about such contamination and may consult with the department as to the appropriateness of sampling and restoration activities to ensure that any contamination or residual source material remaining at the site where source material was used under this general license is not likely to result in exposures that exceed the limits in 20.3.4.426.B NMAC.

E. Any person who receives, possesses, uses, or transfers source material in accordance with the general license granted in Subsection B of this section is exempt from the provisions of 20.3.10 NMAC, and 20.3.4 NMAC to the extent that such receipt, possession, use, and transfer are within the terms of this general license, except that such person shall comply with the provisions of 20.3.4.426.A NMAC and 20.3.4.433 NMAC to the extent necessary to meet the provisions of 20.3.3.304.B NMAC. However, this exemption does not apply to any person who also holds a specific license issued under 20.3.3 NMAC.

F. No person may initially transfer or distribute source material to persons generally licensed under Paragraph (1) and (2) Subsection B of this section, or equivalent regulations of an agreement state, unless authorized by a specific license in accordance with 10 CFR 40.54 or equivalent provisions of an agreement state. This prohibition does not apply to analytical laboratories returning processed samples to the client who initially provided the sample. Initial distribution of source material to persons generally licensed by Subsection A of this section before August 27, 2013, without specific authorization may continue for 1 year beyond this date. Distribution may also be continued until the NRC takes final action on a pending application for a license or license amendment to specifically authorize distribution submitted on or before August 27, 2014.

G. Depleted uranium in industrial products and devices.

(1) A general license is hereby issued to receive, acquire, possess, use or transfer, in accordance with the provisions in Paragraphs (2), (3), (5) and (6) of this subsection, depleted uranium contained in industrial products or devices for the purpose of providing a concentrated mass in a small volume of the product or device.

(2) The general license in Paragraph (1) of this subsection applies only to industrial products or devices which have been manufactured or initially transferred either in accordance with a specific license issued to the manufacturer of the products or devices pursuant to Subsection L of 20.3.3.315 NMAC or in accordance with a specific license issued by the NRC or an agreement state which authorizes manufacture of the products or devices for distribution to persons generally licensed by the NRC or an agreement state.

(3) Persons who receive, acquire, possess or use depleted uranium pursuant to the general license established by Paragraph (1) of this subsection shall file a form, *registration certificate - use of depleted uranium under general license*, with the department. The form shall be submitted within 30 days after the first receipt or acquisition of such depleted uranium. The general licensee shall furnish on the registration form the following information and such other information as may be required by that form:

(a) name and address of the general licensee;

(b) a statement that the general licensee has developed and will maintain procedures designed to establish physical control over the depleted uranium described in Paragraph (1) of this subsection and designed to prevent transfer of such depleted uranium in any form, including metal scrap, to persons not authorized to receive the depleted uranium; and

(c) name and title, address and telephone number of the individual duly authorized to act for and on behalf of the general licensee in supervising the procedures identified in Subparagraph (b) of this paragraph.

(4) The general licensee possessing or using depleted uranium under the general license established by Paragraph (1) of this subsection shall report in writing to the department any changes in information furnished by them in the form *registration certificate-use of depleted uranium under general license*. The report shall be submitted within 30 days after the effective date of such change.

(5) A person, who receives, acquires, possesses or uses depleted uranium pursuant to the general license established by Paragraph (1) of this subsection:

(a) shall not introduce such depleted uranium, in any form, into a chemical, physical

or metallurgical treatment or process, except a treatment or process for repair or restoration of any plating or other covering of the depleted uranium;

(b) shall not abandon such depleted uranium;

(c) shall transfer or dispose of such depleted uranium only by transfer in accordance with the provisions of 20.3.3.323 NMAC; in the case where the transferee receives the depleted uranium pursuant to the general license established by Paragraph (1) of this subsection, the transferor shall furnish the transferee a copy of this subsection and a copy of the registration form; in cases where the transferee receives the depleted uranium pursuant to a general license contained in the NRC or agreement state's regulation equivalent to this subsection, Subsection C of 20.3.3.304 NMAC, the transferor shall furnish the transferee a copy of this subsection and a copy of the registration form accompanied by a note explaining that use of the product or device is regulated by the NRC or agreement state under requirements substantially the same as those in this subsection;

(d) shall report in writing, within 30 days of any transfer, to the department the name and address of the person receiving the depleted uranium pursuant to such transfer; and

(e) shall not export such depleted uranium except in accordance with a license issued by the NRC pursuant to 10 CFR 110.

(6) Any person receiving, acquiring, possessing, using or transferring depleted uranium pursuant to the general license established by Paragraph (1) of this subsection is exempt from the requirements of 20.3.4 NMAC and 20.3.10 NMAC with respect to the depleted uranium covered by that general license.

[20.3.3.304 NMAC - Rp, 20.3.3.304 NMAC, 4/30/2009; A, 8/10/2021]

20.3.3.305 GENERAL LICENSES - RADIOACTIVE MATERIAL OTHER THAN SOURCE MATERIAL:

A. [Reserved]

B. Certain detecting, measuring, gauging or controlling devices and certain devices for producing light or an ionized atmosphere.

(1) A general license is hereby issued as required by Subparagraph (m) of Paragraph (3) of this subsection to commercial and industrial firms and research, educational and medical institutions, individuals in the conduct of their business, and federal, state or local government agencies to receive, acquire, possess, use or transfer, in accordance with the provisions of Paragraphs (2), (3), and (4) of this subsection, byproduct material contained in devices 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 light or an ionized atmosphere, and the device has been registered in the sealed source and device registry.

(2) The general license in Paragraph (1) of this subsection applies only to byproduct material contained in devices which have been manufactured or initially transferred and labeled in accordance with the specifications contained in:

(a) a specific license issued by the department pursuant to Subsection E of 20.3.3.315 NMAC; or

(b) an equivalent specific license issued by the NRC or an agreement state; or

(c) an equivalent specific license issued by a state with provisions comparable to Subsection E of 20.3.3.315 NMAC. The devices must have been received from one of the specific licensees described in this paragraph, or through a transfer made under Subparagraph (h) of Paragraph (3) of this subsection.

(3) Any person who receives, acquires, possesses, uses or transfers byproduct material in a device pursuant to the general license in Paragraph (1) of this subsection shall comply with the following.

(a) The general licensee shall assure that all labels affixed to the device at the time of receipt and bearing a statement that removal of the label is prohibited are maintained thereon and shall comply with all instructions and precautions provided by such labels.

(b) The general licensee shall assure that the device is tested for leakage of radioactive material and proper operation of the on-off mechanism and indicator, if any, at no longer than six month intervals or at such other intervals as are specified in the label; however:

(i) devices containing only krypton need not be tested for leakage of radioactive material; and

(ii) devices containing only tritium or not more than 100 microcuries (3.7 megabecquerels) of other beta or gamma emitting material or 10 microcuries (0.37 megabecquerel) of alpha emitting material and devices held in storage in the original shipping container prior to initial installation need not be tested for any purpose.

1 (c) The general licensee shall assure that the test required by Subparagraph (b) of
2 Paragraph (3) of this subsection and other testing, installation, servicing and removal from installation involving the
3 radioactive materials, its shielding or containment are performed:

4 (i) in accordance with the instructions provided by the labels; or

5 (ii) by a person holding a specific license pursuant to this part from the
6 department, the NRC, or an agreement state to perform such activities.

7 (d) The general licensee shall maintain records showing compliance with the
8 requirements of Subparagraphs (b) and (c) of Paragraph (3) of this subsection. The records must show the results of
9 tests. The records must also show the dates of performance of, and the names of persons performing, testing,
10 installing, servicing and removing from the installation radioactive material and its shielding or containment. The
11 licensee shall retain these records as follows:

12 (i) each record of a test for leakage or radioactive material required by
13 Subparagraph (b) of Paragraph (3) of this subsection shall be retained for three years after the next required leak test
14 is performed or until the sealed source is transferred or disposed of;

15 (ii) each record of a test of the on-off mechanism and indicator required by
16 Subparagraph (b) of Paragraph (3) of this subsection shall be retained for three years after the next required test of
17 the on-off mechanism and indicator is performed or until the sealed source is transferred or disposed of; and

18 (iii) each record that is required by Subparagraph (c) of Paragraph (3) of
19 this subsection shall be retained for 3 years from the date of the recorded event or until the device is transferred or
20 disposed of.

21 (e) The general licensee shall immediately suspend operation of the device if there
22 is a failure of, or damage to, or any indication of a possible failure of or damage to, the shielding of the radioactive
23 material or the on-off mechanism or indicator, or upon the detection of 0.005 microcuries (185 becquerels) or more
24 removable radioactive material. The device may not be operated until it has been repaired by the manufacturer or
25 other person holding a specific license to repair such devices that was issued pursuant to this part by the department,
26 the NRC or an agreement state. The device and any radioactive material from the device, shall only be disposed of
27 by transfer to a person authorized by a specific license to receive the radioactive material in the device, or as
28 otherwise approved by the department. A report shall be furnished to the department within 30 days containing a
29 brief description of the event and the remedial action taken. In the case of detection of 0.005 microcurie or more
30 removable radioactive material or failure of, or damage to, a source likely to result in contamination of the premises
31 or the environs, the report shall include a plan for ensuring that the premises and environs are acceptable for
32 unrestricted use. Under these circumstances, the criteria set out in Subsection B of 20.3.4.426 NMAC, *radiological*
33 *criteria for unrestricted use*, shall be applicable, as determined by the department on a case-by-case basis.

34 (f) The general licensee shall not abandon the device containing radioactive
35 material.

36 (g) The general licensee shall not export the device containing radioactive material
37 except in accordance with 10 CFR 110.

38 (h) **Device transfer requirements.**

39 (i) The general licensee shall transfer or dispose of the device containing
40 radioactive material only by export as provided by Subparagraph (g) of this paragraph, by transfer to another general
41 licensee as authorized in Subparagraph (i) of this paragraph, or to a person authorized to receive the device by a
42 specific license issued by the department pursuant to this part, or by a specific license issued by the department
43 authorizing waste collection pursuant to this part, or equivalent provisions of the NRC or an agreement state, or as
44 otherwise approved under Item (iii) of this subparagraph.

45 (ii) The general licensee shall within 30 days after the transfer of a device
46 to a specific licensee or export, furnish a report to the department at the address indicated in 20.3.1.116 NMAC. The
47 report shall contain the identification of the device by manufacturer's (or initial transferor's) name, model number
48 and serial number; the name, address and license number of the person receiving the device (license number not
49 applicable if exported); and the date of the transfer.

50 (iii) The general licensee shall obtain written department approval before
51 transferring the device to any other specific licensee not specifically identified in Item (i) of this subparagraph.
52 However, a holder of a specific license may transfer a device for possession and use under its own specific license
53 without prior approval, if, the holder: verifies that the specific license authorizes the possession and use, or applies
54 for and obtains amendment to the license authorizing the possession and use; removes, alters, covers, or clearly and
55 unambiguously augments the existing label (otherwise required by Subparagraph (a) of this paragraph) so that the
56 device is labeled in compliance with 20.3.4.430 NMAC, however, the manufacturer, model number, and serial

number must be retained; obtains the manufacturer's or initial transferor's information concerning maintenance that would be applicable under the specific license (such as leak testing procedures); and reports the transfer under Item (ii) of this subparagraph.

(i) The general licensee shall transfer the device to another general licensee only if:

(i) the device remains in use at a particular location, in which case: 1) the transferor shall give the transferee a copy of this subsection (Subsection B of 20.3.3.305 NMAC), a copy of Subsection F of 20.3.3.317 NMAC, a copy of 20.3.3.326 NMAC, a copy of 20.3.4.451 NMAC, a copy of 20.3.4.452 NMAC and any safety documents identified in the label of the device; 2) within 30 days of the transfer, the transferor shall report to the department at the address indicated in 20.3.1.116 NMAC, stating the manufacturer's (or initial transferor's) name, the model number and the serial number of the device transferred, the transferee's name and mailing address for the location of use, and the name, title and phone number of the responsible individual identified by the transferee in accordance with Subparagraph (l) of this paragraph to have knowledge of and authority to take actions to ensure compliance with the appropriate regulations and requirements; or

(ii) the device is held in storage by an intermediate person in the original shipping container at its intended location of use prior to initial use by a general licensee.

(j) The general licensee shall comply with the provisions of 20.3.4.451 NMAC and 20.3.4.452 NMAC for reporting radiation incidents, theft or loss of licensed material, but shall be exempt from the other requirements of 20.3.4 NMAC and 20.3.10 NMAC.

(k) The general licensee shall respond to written requests from the department to provide information relating to the general license within 30 calendar days of the date of the request, or other time specified in the request. If the general licensee cannot provide the requested information within the allotted time, it shall, within that same time period, request a longer period to supply the information by providing the department with a written justification for the request.

(l) The general licensee shall appoint an individual responsible for having knowledge of the appropriate regulations and requirements and the authority for taking required actions to comply with appropriate regulations and requirements. The general licensee, through this individual, shall ensure the day-to-day compliance with appropriate regulations and requirements. This appointment does not relieve the general licensee of any of its responsibility in this regard.

(m) Registration requirements.

(i) The general licensee shall register on a department registration form, in accordance with Items (ii) and (iii) of this subparagraph, devices containing at least 10 millicuries (370 megabecquerels) of cesium-137, 0.1 millicuries (3.7 megabecquerels) of strontium-90, 1 millicurie (37 megabecquerels) of cobalt-60, 0.1 millicurie (3.7 megabecquerels) of radium-226, 1 millicurie (37 megabecquerels) of americium-241 or any other transuranic (i.e., element with atomic number greater than uranium (92)), based on the activity indicated on the label. Each address of a location of use, as described under Item (iii) of this subparagraph, represents a separate general licensee and requires a separate registration.

(ii) If in possession of a device meeting the criteria of Item (i) of this subparagraph, the general licensee shall register these devices annually with the department. Registration shall be done by verifying, correcting or adding to the information provided in a request for registration received from the department. The registration information shall be submitted to the department within 30 days of the date of the request for registration or as otherwise indicated in the request. In addition, a general licensee holding devices meeting the criteria of Item (i) of this subparagraph is subject to the bankruptcy notification requirement in Subsection E of 20.3.3.317 NMAC.

(iii) In registering devices, the general licensee shall furnish the following information and any other information specifically requested by the department: 1) name and mailing address of the general licensee; 2) information about each device: the manufacturer (or initial transferor), model number, serial number, the radioisotope and activity (as indicated on the label); 3) name, title and telephone number of the responsible person designated as a representative of the general licensee under Subparagraph (l) of this paragraph; 4) address or location at which the device(s) are used or stored; for portable devices, the address of the primary place of storage; 5) certification by the responsible representative of the general licensee that the information concerning the device(s) has been verified through a physical inventory and checking of label information; and 6) certification by the responsible representative of the general licensee that they are aware of the requirements of the general license.

(iv) Persons generally licensed by the NRC and an agreement state with respect to devices meeting the criteria in Item (i) of this subparagraph are not subject to registration requirements if the devices are used in areas subject to department jurisdiction for a period less than 180 days in any calendar year. The department will not request registration information from such licensees.

1 (n) The general licensee shall report changes to the mailing address for the location
2 of use (including change in name of general licensee) to the department at the address indicated in 20.3.1.116
3 NMAC, within 30 days of the effective date of the change. For a portable device, a report of address change is only
4 required for a change in the device's primary place of storage.

5 (o) The general licensee shall not hold devices that are not in use for longer than 2
6 years. If devices with shutters are not being used, the shutter shall be locked in the closed position. The testing
7 required by Subparagraph (b) of Paragraph (3) of this subsection need not be performed during the period of storage
8 only. However, when devices are put back into service or transferred to another person, and have not been tested
9 within the required test interval, they shall be tested for leakage before use or transfer and the shutter tested before
10 use. Devices kept in standby for future use are excluded from the two-year time limit if the general licensee
11 performs quarterly physical inventories of these devices while they are in standby.

12 (4) The general license in Paragraph (1) of this subsection does not authorize the
13 manufacture or import of devices containing radioactive material.

14 **C. Luminous safety devices for use in aircraft.**

15 (1) A general license is hereby issued to own, receive, acquire, possess and use tritium or
16 promethium-147 contained in luminous safety devices for use in aircraft, provided:

17 (a) each device contains not more than 10 curies (370 gigabecquerels) of tritium or
18 300 millicuries (11.1 gigabecquerels) of promethium-147;

19 (b) each device has been manufactured, assembled or initially transferred in
20 accordance with a license issued under the provisions 10 CFR 32.53 or manufactured or assembled in accordance
21 with a specific license issued by the NRC];

22 (c) quality assurance procedures are in place that are sufficient to ensure
23 compliance with 10 CFR 32.55; and

24 (d) prototypes of the device have been subjected to and have satisfactorily passed
25 the tests required in 10 CFR 32.53(e) and outlined in Subsection C(2) of this section.

26 (2) The applicant shall subject at least five prototypes of the device to tests as follows:

27 (a) the devices are subjected to tests that adequately take into account the
28 individual, aggregate, and cumulative effects of environmental conditions expected in service that could adversely
29 affect the effective containment of tritium or promethium-147, such as temperature, moisture, absolute pressure,
30 water immersion, vibration, shock, and weathering;

31 (b) the devices are inspected for evidence of physical damage and for loss of tritium
32 or promethium-147, after each stage of testing, using methods of inspection adequate for determining compliance
33 with the criteria in subparagraph C(2) of this section; and

34 (c) the device designs are rejected for which the following has been detected for any
35 unit; a leak resulting in a loss of one tenth of one percent or more of the original amount of tritium or promethium-
36 147 from the device; or surface contamination of tritium or promethium-147 on the device of more than 2,200
37 disintegrations per minute per 100 square centimeters of surface area; or any other evidence of physical damage.

38 (3) Each person licensed under 10 CFR 32.55 or Subsection C of 20.3.3.305 NMAC shall
39 visually inspect each device and shall reject any that has an observable physical defect that could adversely affect
40 containment of the tritium or promethium-147.

41 (4) Each person licensed under 10 CFR 32.53 or Subsection C of 20.3.3.305 shall:

42 (a) maintain quality assurance systems in the manufacture of the luminous safety
43 device in a manner sufficient to provide reasonable assurance that the safety-related components of the distributed
44 devices are capable of performing their intended functions; and

45 (b) subject inspection lots to acceptance sampling procedures, by procedures
46 specified in Subparagraph C(2) of this section and in the license issued under 10 CFR 32.53 or Subsection C of
47 20.3.3.305 NMAC to provide at least ninety-five percent confidence that the lot tolerance percent defective of five
48 percent will not be exceeded.

49 (5) The licensee shall subject each inspection lot to:

50 (a) tests that adequately take into account the individual, aggregate, and cumulative
51 effects of environmental conditions expected in service that could adversely affect the effective containment of
52 tritium or promethium-147, such as absolute pressure and water immersion; and

53 (b) inspection for evidence of physical damage, containment failure, or loss of
54 tritium or promethium-147 after each stage of testing, using methods of inspection adequate for applying the
55 following criteria for defective:

56 (i) a leak resulting in a loss of one tenth of one percent or more of the

original amount of tritium or promethium-147 from the device;

(ii) levels of radiation in excess of 5 microgray (0.5 millirad) per hour at 10 centimeters from any surface when measured through 50 milligrams per square centimeter of absorber, if the device contains promethium-147; and

(iii) any other criteria specified in the license issued under 10 CFR 32.53 or Subsection C of 20.3.3.305 NMAC.

(6) No person licensed under 10 CFR 32.53 or Subsection C of 20.3.3.305 NMAC shall transfer to persons generally licensed pursuant to 10 CFR 31.7 or under an equivalent general license of an agreement state:

(a) any luminous safety device tested and found defective under any condition of a license issued under Subsection C of this section, unless the defective luminous safety device has been repaired or reworked, retested, and determined by an independent inspector to meet the applicable acceptance criteria; or

(b) any luminous safety device contained within any lot that has been sampled and rejected as a result of the procedures in Subsection C(4)(b) of this section, unless a procedure for defining sub-lot size, independence, and additional testing procedures is contained in the license issued under 10 CFR 32.53 or Subsection C of 20.3.3.305 NMAC and each individual sub-lot is sampled, tested, and accepted in accordance with Subsection C(2) of this section and any other criteria that may be required as a condition of the license issued under 10 CFR 32.53 or Subsection C of 20.3.3.305 NMAC.

(7) Persons who own, receive, acquire, possess or use luminous safety devices pursuant to this general license are exempt from the requirements of 20.3.4 NMAC and 20.3.10 NMAC except that they shall comply with the reporting and notification provisions of 20.3.4.451 NMAC and 20.3.4.452 NMAC.

(8) This general license does not authorize the manufacture, assembly, repair or import of luminous safety containing tritium or promethium-147.

(9) This general license does not authorize the export of luminous safety devices containing tritium or promethium-147.

(10) This general license does not authorize the ownership, receipt, acquisition, possession or use of promethium-147 contained in instrument dials.

D. Calibration and reference sources.

(1) A general license is hereby issued to those persons listed in this paragraph to own, receive, acquire, possess, use and transfer, in accordance with the provisions of Paragraphs (4) and (5) of this subsection americium-241 in the form of calibration or reference sources.

(a) Any person who holds a specific license issued by the department which authorizes them to receive, possess, use and transfer radioactive material.

(b) Any government agency, as defined in 20.3.1.7 NMAC, which holds a specific license issued pursuant to this chapter which authorizes it to receive, possess, use and transfer radioactive material.

(2) A general license is hereby issued to those persons listed below to receive title to, own, acquire, deliver, receive, possess, use and transfer in accordance with the provisions of Paragraph (4) and (5) plutonium in the form of calibration or reference sources.

(a) Any person who holds a specific license issued by the department which authorizes them to receive, possess, use and transfer radioactive material.

(b) Any government agency, as defined in 20.3.1.7 NMAC, which holds a specific license issued pursuant to 20.3 NMAC which authorizes it to receive, possess, use and transfer radioactive material.

(c) Any person who holds a specific license issued by the NRC or an agreement state which authorizes them to receive, possess, use and transfer special nuclear material.

(3) A general license is hereby issued to receive, possess, use and transfer radium-226 in the form of calibration or reference sources in accordance with Paragraphs (4) and (5) of this subsection to any person who holds a specific license issued by the department which authorizes them to receive, possess, use and transfer radioactive material.

(4) The general licenses in Paragraphs (1), (2) and (3) of this subsection apply only to calibration or reference sources which have been manufactured or initially transferred in accordance with the specifications contained in a specific license issued the department pursuant to Subsection G of 20.3.3.315 NMAC or in accordance with the specifications contained in a specific license issued by the NRC or an agreement state pursuant to equivalent licensing requirements which authorizes the manufacturer of the sources for distribution to persons generally licensed by the NRC or an agreement state.

(5) The general licenses provided in Paragraphs (1), (2) and (3) of this subsection are subject to the provisions of Subsection F of 20.3.3.317 NMAC. In addition, persons who receive, acquire, possess, use or

transfer one or more calibration or reference sources pursuant to these general licenses:

(a) shall not possess at any one time, at any one location of storage or use, more than 5 microcuries (185 kilobecquerels) of americium-241, 5 microcuries (185 kilobecquerels) of plutonium and 5 microcuries (185 kilobecquerels) of radium-226 in such sources;

(b) shall not receive, possess, use or transfer such source unless the source, or the storage container, bears a label which includes the following statement or a substantially similar statement which contains the information called for in the following statement:

The receipt, possession, use and transfer of this source, model _____, serial number _____, are subject to a general license and the regulations of the United States nuclear regulatory commission or of a state with which the commission has entered into an agreement for the exercise of regulatory authority. Do not remove this label.

Caution - radioactive material - this source contains [describe one of the following radioactive materials americium-241, plutonium or radium-226 as appropriate]. Do not touch radioactive portion of this source.

(name of manufacturer or initial transferor)

(c) shall not transfer, abandon or dispose of such source except by transfer to a person authorized by a license issued by the department, the NRC or an agreement state to receive the source;

(d) shall store such source, except when the source is being used, in a closed container adequately designated and constructed to contain americium-241, plutonium or radium-226 which might otherwise escape during storage; and

(e) shall not use such source for any purpose other than the calibration of radiation detectors or the standardization of other sources.

(6) These general licenses do not authorize the manufacture or import of calibration or reference sources containing americium-241, plutonium or radium-226.

E. General license to install devices generally licensed in Subsection B of 20.3.3.305 NMAC.

Any person who holds a specific license issued by the NRC or an agreement state authorizing the holder to manufacture, install or service a device described in Subsection B of this section within such agreement state issuing the specific license or within a location subject to NRC jurisdiction, is hereby granted a general license to install and service such device in this state; provided, that:

(1) the device has been manufactured, labeled, installed and serviced in accordance with applicable provisions of the specific license issued to such person by the NRC or an agreement state; and

(2) such person assures that any labels required to be affixed to the device under regulations of the NRC or agreement state which licensed manufacture of the device bear a statement that removal of the label is prohibited.

F. General license for use of radioactive material for certain in-vitro clinical or laboratory testing.

(1) A general license is hereby issued to any physician, veterinarian in the practice of veterinary medicine, clinical laboratory or hospital to receive, acquire, possess, transfer or use, for any of the following stated tests, in accordance with the provisions of Paragraphs (2) through (6) of this subsection, the following radioactive materials in prepackaged units, each for use for in-vitro clinical or laboratory tests not involving internal or external administration of radioactive material, or the radiation therefrom, to human beings or animals:

(a) iodine-125, in units not exceeding 10 microcuries (370 kilobecquerels) each;

(b) iodine-131, in units not exceeding 10 microcuries (370 kilobecquerels) each;

(c) carbon-14, in units not exceeding 10 microcuries (370 kilobecquerels) each;

(d) hydrogen-3, in units not exceeding 50 microcuries (1.85 megabecquerels) each;

(e) iron-59, in units not exceeding 20 microcuries (740 kilobecquerels) each;

(f) cobalt-57, in units not exceeding 10 microcuries (370 kilobecquerels) each;

(g) selenium-75, in units not exceeding 10 microcuries (370 kilobecquerels) each;

and

(h) mock iodine-125 for use as reference or calibration sources not to exceed 0.05 microcurie (1.85 kilobecquerels) of iodine-129 and 0.005 microcurie (1.85 becquerels) of americium-241 each.

(2) No person shall receive, acquire, possess, use or transfer radioactive material pursuant to the general license established by Paragraph (1) of this subsection unless that person

(a) has filed a form, *registration certificate-in vitro testing with radioactive material under general license*, with the department and received from the department a validated copy of the registration certificate with a registration number assigned. The physician, clinical laboratory or hospital shall

furnish on the registration certificate the following information and such other information as may be required by the form:

(i) name and address of the physician, clinical laboratory or hospital;
(ii) the location of use; and
(iii) a statement that the physician, veterinarian, clinical laboratory or hospital has appropriate radiation measuring instruments to carry out in vitro clinical or laboratory tests with radioactive material as authorized under the general license in Paragraph (1) of this subsection and that such tests will be performed only by personnel competent in the use of such instruments and in the handling of the radioactive material; or

(b) has a license that authorizes the medical use of radioactive material that was issued under 20.3.7 NMAC.

(3) A person who receives, acquires, possesses or uses radioactive material pursuant to the general license established by Paragraph (1) of this subsection shall comply with the following:

(a) the general licensee shall not possess at any one time, pursuant to the general license in Paragraph (1) of this subsection at any one location of storage or use, a total amount of iodine-125, iodine-131, iron-59, cobalt-57 or selenium-75 in excess of 200 microcuries (7.4 megabecquerels);

(b) the general licensee shall store the radioactive material, until used, in the original shipping container or in a container providing equivalent radiation protection;

(c) the general licensee shall use the radioactive material only for the uses authorized by Paragraph (1) of this subsection;

(d) the general licensee shall neither transfer the radioactive material except by transfer to a person authorized to receive it pursuant to a license issued by the department, the NRC or an agreement state, nor transfer the radioactive material in any manner other than in the unopened, labeled shipping container as received from the supplier; and

(e) the general licensee shall dispose of mock iodine reference or calibration sources in accordance with 20.3.4.433 NMAC.

(4) The general licensee shall not receive, acquire, possess or use radioactive material pursuant to Paragraph (1) of this subsection:

(a) except as prepackaged units which are labeled in accordance with the provisions of a specific license issued under Subsection H of 20.3.3.315 NMAC, or in accordance with the provisions of a specific license issued by the NRC or an agreement state, or labeled before November 30, 2007 in accordance with the provisions of a specific license issued by a state with comparable provisions to Subsection H of 20.3.3.315 NMAC, which authorizes the manufacture and distribution of iodine-125, iodine-131, carbon-14, hydrogen-3 (tritium), iron-59, cobalt-57, selenium-75, or mock iodine-125 for distribution to persons generally licensed by the NRC, the agreement state or the state with comparable provisions to Subsection H of 20.3.3.315 NMAC; and

(b) unless the following statement, or a substantially similar statement, which contains the information called for in the following statement appears on a label affixed to each prepackaged unit or appears in a leaflet or brochure which accompanies the package:

This radioactive material shall be received, acquired, possessed and used only by physicians, veterinarians in the practice of veterinary medicine, clinical laboratories or hospitals and only for in-vitro clinical or laboratory tests not involving internal or external administration of the material, or the radiation therefrom, to human beings or animals. Its receipt, acquisition, possession, use and transfer are subject to the regulations and a general license of the U.S. nuclear regulatory commission or of a State with which the commission has entered into an agreement for the exercise of regulatory authority.

(name of manufacturer)

(5) The general licensee possessing or using radioactive material under the general license of Paragraph (1) of this subsection shall report in writing to the department, any changes in the information furnished by them in the *certificate-in-vitro testing with radioactive material under general license* form. The report shall be furnished within 30 days after the effective date of such change.

(6) Any person using radioactive material pursuant to the general license of Paragraph (1) of this subsection is exempt from the requirements of 20.3.4 NMAC and 20.3.10 NMAC with respect to radioactive material covered by that general license except that such person using a mock iodine-125 shall comply with the provisions of 20.3.4.433 NMAC, 20.3.4.451 NMAC and 20.3.4.452 NMAC.

G. General license for strontium 90 in ice detection devices.

(1) A general license is hereby issued to own, receive, acquire, possess, use and transfer

1 strontium-90 contained in ice detection devices, provided each device contains not more than 50 microcuries (1.85
2 megabecquerels) of strontium-90 and each device has been manufactured or initially transferred in accordance with
3 a specific license issued by the department, the NRC or an agreement state, which authorizes manufacture of the ice
4 detection devices for distribution to persons generally licensed by the department, NRC or an agreement state.

5 (2) Persons who own, receive, acquire, possess, use or transfer strontium-90 contained in ice
6 detection devices pursuant to the general license in Paragraph (1) of this subsection:

7 (a) shall, upon occurrence of visually observable damage, such as a bend or crack or
8 discoloration from overheating, to the device, discontinue use of the device until it has been inspected, tested for
9 leakage and repaired by a person holding a specific license from the department, the NRC or an agreement state to
10 manufacture or service such devices; or shall dispose of the device pursuant to the provisions of 20.3.4.433 NMAC;

11 (b) shall assure that all labels affixed to the device at the time of receipt, and which
12 bear a statement which prohibits removal of the labels, are maintained thereof; and

13 (c) are exempt from the requirement of 20.3.4 NMAC and 20.3.10 NMAC except
14 that such persons shall comply with the provisions of 20.3.4.433 NMAC, 20.3.4.451 NMAC and 20.3.4.452 NMAC.

15 (3) This general license does not authorize the manufacture, assembly, disassembly, repair or
16 import of strontium-90 in ice detection devices.

17 **H. General license for certain items and self-luminous products containing radium-226.**

18 (1) A general license is hereby issued to any person to acquire, receive, possess, use or
19 transfer, in accordance with the provisions of Paragraphs (2), (3) and (4) of this subsection, radium-226 contained in
20 the following products manufactured prior to November 30, 2007.

21 (a) Antiquities originally intended for use by the general public. For the purposes
22 of this paragraph, antiquities mean products originally intended for use by the general public and distributed in the
23 late 19th and early 20th centuries, such as radium emanator jars, revigators, radium water jars, radon generators,
24 refrigerator cards, radium bath salts and healing pads.

25 (b) Intact timepieces containing greater than 0.037 megabecquerel (1 microcurie),
26 non-intact timepieces, and timepiece hands and dials no longer installed in timepieces.

27 (c) Luminous items installed in air, marine or land vehicles.

28 (d) All other luminous products, provided that no more than 100 items are used or
29 stored at the same location at any one time.

30 (e) Small radium sources containing no more than 1 microcurie (0.037
31 megabecquerel) of radium-226. For the purposes of this paragraph, "small radium sources" means discrete survey
32 instrument check sources, sources contained in radiation measuring instruments, sources used in educational
33 demonstrations (such as cloud chambers and spinthariscopes), electron tubes, lightning rods, ionization sources,
34 static eliminators or as designated by the department or NRC.

35 (2) Persons who acquire, receive, possess, use or transfer byproduct material under the
36 general license issued in Paragraph (1) of this subsection are exempt from the provisions of 20.3.3.325 NMAC,
37 20.3.3.326 NMAC, 20.3.4 NMAC and 20.3.10 NMAC to the extent that the receipt, possession, use or transfer of
38 radioactive material is within the terms of the general license; provided, however, that this exemption shall not be
39 deemed to apply to any such person specifically licensed under this chapter.

40 (3) Any person who acquires, receives, possesses, uses or transfers radioactive material in
41 accordance with the general license in Paragraph (1) of this section shall:

42 (a) notify the department should there be any indication of possible damage to the
43 product so that it appears it could result in a loss of the radioactive material. A report containing a brief description
44 of the event, and the remedial action taken, must be furnished to the department at the address specified in
45 20.3.1.116 NMAC within 30 days of the event;

46 (b) not abandon products containing radium-226; the product, and any radioactive
47 material from the product, may only be disposed of according to 20.3.4.437 NMAC or by transfer to a person
48 authorized by a specific license to receive the radium-226 in the product or as otherwise approved by the
49 department;

50 (c) not export products containing radium-226 except in accordance with 10 CFR
51 110;

52 (d) dispose of products containing radium-226 at a disposal facility authorized to
53 dispose of radioactive material in accordance with any federal or state solid or hazardous waste law, including the
54 Solid Waste Disposal Act, as authorized under the Energy Policy Act, by transfer to a person authorized to receive
55 radium-226 by a specific license issued under this part, or equivalent regulations of the NRC, an agreement state or
56 as otherwise approved by the department or NRC;

(e) respond to written requests from the department to provide information relating to the general license within 30 calendar days of the date of the request, or other time specified in the request. If the general licensee cannot provide the requested information within the allotted time, it shall, within that same time period, request a longer period to supply the information by providing the department a written justification for the request.

(4) The general license in Paragraph (1) of this section does not authorize the manufacture, assembly, disassembly, repair or import of products containing radium-226, except when timepieces may be disassembled and repaired.

I. General license to own radioactive material. A general license is hereby issued to receive title to and own radioactive material without regard to quantity. Notwithstanding any other provision of this chapter, a general licensee under this subsection is not authorized to acquire, deliver, manufacture, produce, transfer, receive, possess, use, import or export radioactive material, except as authorized in a specific license.
[20.3.3.305 NMAC - Rp, 20.3.3.305 NMAC, 04/30/2009; A, 8/10/2021]

20.3.3.306 TRANSPORTATION OF RADIOACTIVE MATERIAL:

A. Except as specified in Subsection D of this section, the regulations of the United States NRC set forth in 10 CFR 71 are hereby incorporated by reference.

B. Shipment and transport of radioactive material shall be in accordance with the provisions of Subsection A of this section.

C. The following modifications are made to the incorporated federal regulations in this section:

(1) “**commission**” means the NRC except a specified in subsection (4) below;

(2) “**act**” means the Radiation Protection Act, Sections 74-3-1 through 74-3-16 NMSA 1978;
and

(3) “**byproduct material**” means radioactive material as defined in 20.3.1.7 NMAC.

(4) all reference in 10 CFR 71 to “commission” are changed to department as follows:
71.17(a), 71.17(b), 71.21, 71.91(b), 71.91(c), 71.91(d), 71.101(c)(1), 71.106(a), 71.106(a)(1), 71.106(b) and 71.106(b)(1).

(5) all reference in 10 CFR 71 to “certificate holder”, “applicant” and “applicant for a certificate of compliance (COC)” apply to the NRC as follows 71.91(c), 71.91(d), 71.101(a), 71.101(b), 71.103(a) and 71.135.

D. The following provisions contained in 10 CFR 71 are applicable to the NRC and not incorporated in this section: 71.11, 71.14(b), 71.19, 71.31, 71.33, 71.35, 71.37, 71.38, 71.39, 71.41, 71.43, 71.45, 71.51, 71.55, 71.59, 71.61, 71.63, 71.64, 71.65, 71.70, 71.71, 71.73, 71.74, 71.75, 71.77, 71.85(a)-(c), 71.91(b), 71.101(c)(2), (d), and (e), 71.107, 71.109, 71.111, 71.113, 71.115, 71.117, 71.119, 71.121, 71.123, and 71.125.

[20.3.3.306 NMAC - Rp, 20.3.3.306 NMAC & 20.3.3.325 NMAC, 04/30/2009; A, 6/30/2011; A, 8/10/2021]

20.3.3.307 FILING APPLICATION FOR SPECIFIC LICENSES:

A. Except where otherwise determined by the department, applications for specific licenses shall be filed in duplicate on a form prescribed by the department (*application for a radioactive material license*) in accordance with the instructions to the form. Additional copies of the application may be required by the department. Information contained in previous application, statements or reports filed with the department may be incorporated by reference, provided that the reference is clear and specific.

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

C. Each application shall be signed by the applicant or licensee or a person duly authorized to act for and on their behalf.

D. An application for a license may include a request for a license authorizing more than one activity, provided that the application specifies the additional activities for which licenses are requested and complies with the requirements in this chapter as to applications for such licenses. In such cases, annual fees for all types of activities authorized by the license may be charged as determined by 20.3.16 NMAC.

E. An application for a specific license of category 1 and category 2 quantities of radioactive material shall comply with 10 CFR 37. The licensee shall comply with 10 CFR 37 except as follows:

(1) any reference to the commission or NRC shall be deemed a reference to the department;

(2) 10 CFR 37.5 definitions of agreement state, byproduct material, commission and person shall not be applicable;

1 (3) 10 CFR 37.7, 10 CFR 37.9, 10 CFR 37.11(a) and (b), 10 CFR 37.13, 10 CFR 37.27(c),
2 10 CFR 37.105, and 10 CFR 37.107 shall not be applicable; and

3 (4) the license required report of events or notification in 10 CFR 37.45, 10 CFR 37.57, 10
4 CFR 71, 10 CFR 37.77(a) through (d), and 10 CFR 37.81 shall use the following address when applicable: New
5 Mexico Environment Department/RCB, P.O. Box 5469, Santa Fe, NM 87502-5469.

6 **F.** An application for a specific license to use radioactive material in the form of a sealed source or in
7 a device that contains the sealed source must identify the source and (or) the device by manufacturer name and
8 model number as registered with the *sealed source and device registry*.

9 (1) Except as provided in Paragraph (2), (3) and (4) of this Subsection, an application for a
10 specific license to use byproduct material in the form of a sealed source or in a device that contains the sealed source
11 must either:

12 (a) identify the source or device by manufacturer and model number registered with
13 the NRC pursuant to 10 CFR 32.210, with an agreement state, or for a source or a device containing radium-226 or
14 accelerator-produced radioactive material with a state under provisions comparable to 10 CFR 32.210; or

15 (b) contain the information identified in 10 CFR 32.210(c).

16 (2) For sources or devices manufactured before October 23, 2012 that are not registered with
17 the NRC under 10 CFR 32.210 or with an agreement state, and for which the applicant is unable to provide all
18 categories of information specified in 10 CFR 32.210(c), the application must include:

19 (a) all available information identified in 10 CFR 32.210(c) concerning the source,
20 and, if applicable, the device; and

21 (b) sufficient additional information to demonstrate that there is reasonable
22 assurance that the radiation safety properties of the source or device are adequate to protect health and minimize
23 danger to life and property. Such information must include a description of the source or device, a description of
24 radiation safety features, the intended use and associated operating experience, and the results of a recent leak test.

25 (3) For sealed sources and devices allowed to be distributed without registration of safety
26 information in accordance with 10 CFR 32.210(g)(1), the applicant may supply only the manufacturer, model
27 number, and radionuclide and quantity.

28 (4) If it is not feasible to identify each sealed source and device individually, the applicant
29 may propose constraints on the number and type of sealed sources and devices to be used and the conditions under
30 which they will be used, in lieu of identifying each sealed source and device.

31 **G.** As provided by 20.3.3.311 NMAC, certain applications for a new or renewal specific license must
32 contain a proposed decommissioning funding plan or a certification of financial assurance for decommissioning.

33 **H.** An application for a license to receive and possess radioactive material for the conduct of any
34 activity which the department has determined pursuant to Subpart A of 10 CFR 51 will significantly affect the
35 quality of the environment shall be filed at least nine months prior to commencement of construction of the plant or
36 facility in which the activity will be conducted and shall be accompanied by an environmental impact report
37 required pursuant to Subpart A of 10 CFR 51.

38 **I.** None of the following applications shall be accepted for review unless it is accompanied by an
39 environmental impact report, submitted by the applicant, that specifically addresses the short-term and long-term
40 environmental, radiological and public health and safety aspects of the applications and alternatives to the proposed
41 action:

42 (1) an initial application for a radioactive material license for a commercial radioactive waste
43 disposal site license;

44 (2) the first renewal of any such license not previously accompanied by an environmental
45 impact report;

46 (3) an application for an amendment to an existing license that may result in additional
47 significant impacts from radiation on the environment or public health or safety beyond those impacts addressed in
48 the existing license and accompanying documents; and

49 (4) any other application that the secretary determines may have significant impacts from
50 radiation on the environment or public health or safety.

51 **J.** The application for a radioactive material license for a commercial radioactive waste disposal site,
52 or for any renewal thereof, or for an amendment thereto as described in Paragraph (3) of Subsection H of this
53 section, shall demonstrate that the activity for which such license is requested will comply with all laws and
54 regulations enforceable by the department.

55 **K.** An application from a medical facility or educational institution to produce PET radioactive drugs
56 for noncommercial transfer to licensees in its consortium authorized for medical use under 20.3.7 NMAC shall

1 include:

2 (1) a request for authorization for the production of PET radionuclides or evidence of an
3 existing license issued under 20.3.3 NMAC or under equivalent NRC or agreement state requirements for a PET
4 radionuclide production facility within its consortium from which it receives PET radionuclides;

5 (2) evidence that the applicant is qualified to produce radioactive drugs for medical use by
6 meeting one of the criteria in Subparagraph (b) of Paragraph (1) of Subsection J of 20.3.3.315 NMAC;

7 (3) identification of individual(s) authorized to prepare the PET radioactive drugs if the
8 applicant is a pharmacy, and documentation that each individual meets the requirements of an authorized nuclear
9 pharmacist as specified in Subparagraph (b) of Paragraph (2) of Subsection J of 20.3.3.315 NMAC; and

10 (4) information identified in Subparagraph (c) of Paragraph (1) of Subsection J of 20.3.3.315
11 NMAC on the PET drugs to be non-commercially transferred to members of its consortium.

12 **L.** An application for a specific license to transfer source material under this section.

13 (1) An application for a specific license to initially transfer source material for use under
14 20.3.3.307 NMAC, will be approved if:

15 (a) the applicant satisfies the general requirements specified in this section; and

16 (b) the applicant submits adequate information on, and the department approves the
17 methods to be used for quality control, labeling, and providing safety instructions to recipients.

18 (2) Each person licensed under this section shall label the immediate container of each
19 quantity of source material with the type of source material and quantity of material and the words, "radioactive
20 material."

21 (3) Each person licensed under this section shall ensure that the quantities and concentrations
22 of source material are as labeled and indicated in any transfer records.

23 (4) Each person licensed under this section shall provide the information specified in this
24 paragraph to each person to whom source material is transferred for use under this section. This information must
25 be transferred before the source material is transferred for the first time in each calendar year to the particular
26 recipient. The required information includes:

27 (a) a copy of Subsection B of 20.3.3.304.B NMAC and 10 CFR 40.51 or equivalent
28 regulations under Subsection L of 20.3.3.307 NMAC; and

29 (b) appropriate radiation safety precautions and instructions relating to handling,
30 use, storage, and disposal of the material.

31 (5) Each person licensed under this section shall report transfers as follows:

32 (a) File a report with the department under 20.3.1.116 NMAC. The report shall
33 include the following information:

34 (i) The name, address, and license number of the person who transferred
35 the source material; and

36 (ii) For each general licensee under 10 CFR 40.22 or 20.3.3.304 NMAC to
37 whom greater than 50 grams (0.11 lb) of source material has been transferred in a single calendar quarter, the name
38 and address of the general licensee to whom source material is distributed; a responsible agent, by name and/or
39 position and phone number, of the general licensee to whom the material was sent; and the type, physical form, and
40 quantity of source material transferred; and

41 (iii) The total quantity of each type and physical form of source material
42 transferred in the reporting period to all such generally licensed recipients.

43 (b) File a report with each responsible agreement state agency that identifies all
44 persons, operating under the provisions equivalent to 10 CFR 40.22, to whom greater than 50 grams (0.11 lb) of
45 source material has been transferred within a single calendar quarter. The report shall include the following
46 information specific to those transfers made to the agreement state:

47 (i) The name, address, and license number of the person who transferred
48 the source material;

49 (ii) The name and address of the general licensee to whom source material
50 was distributed; a responsible agent, by name and/or position and phone number, of the general licensee to whom
51 the material was sent; and the type, physical form, and quantity of source material transferred; and

52 (iii) The total quantity of each type and physical form of source material
53 transferred in the reporting period to all such generally licensed recipients within the Agreement State.

54 (c) Submit each report by January 31 of each year covering all transfers for the
55 previous calendar year. If no transfers were made to persons generally licensed under 10 CFR 40.22 or equivalent
56 agreement state provisions during the current period, a report shall be submitted to the NRC indicating so. If no

transfers have been made to general licensees in a particular agreement state during the reporting period, this information shall be reported to the responsible agreement state agency upon request of the agency.

(d) Each person licensed under 20.3.3.304 NMAC shall maintain all information that supports the reports required by this section concerning each transfer to a general licensee for a period of one year after the event is included in a report to the NRC or to an agreement state agency.
[20.3.3.307 NMAC - Rp, 20.3.3.307 NMAC, 04/30/2009; A, 02/14/2023]

20.3.3.308 GENERAL REQUIREMENTS FOR THE ISSUANCE OF SPECIFIC LICENSES:

A. An application for a specific license shall be approved if all of the following requirements are met.

(1) The application is for a purpose authorized by the act.

(2) The applicant is qualified by training and experience to use the material for the purpose requested in accordance with the provisions in this chapter and in such a manner as to minimize the danger to public health and safety or property.

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

(4) The applicant satisfies the requirements in this section, and any special requirements in 20.3.3.307 NMAC and 20.3.3.309 NMAC, 20.3.3.313 NMAC, 20.3.3.314 NMAC or 20.3.3.315 NMAC.

B. Upon a determination that an application meets the requirements of the act and the 20.3 NMAC, the department will issue a specific license authorizing the possession and use of radioactive material.

C. The secretary may deny an application if an applicant:

(1) fails to demonstrate that the requirements of the act and 20.3 NMAC have been addressed;

(2) fails to meet the requirements for completeness and accuracy of information in 20.3.1.123 NMAC;

(3) has demonstrated deliberate misconduct as described in 20.3.1.122 NMAC; and

(4) fails to respond to a request for additional information within 30 days from the date of the request, or within such other time as may be specified in the request for information.

[20.3.3.308 NMAC - Rp, 20.3.3.308 NMAC, 4/30/2009; A, 6/13/2017]

20.3.3.309 REQUIREMENTS FOR EMERGENCY RESPONSE PLANS FOR CERTAIN LICENSEES:

A. Each application to possess radioactive materials in unsealed forms, on foils or plated sources, or sealed in glass in excess of the quantities in 20.3.3.333 NMAC (Schedule E - Quantities of Radioactive Materials Requiring Consideration of the Need for an Emergency Plan for Responding to a Release), must contain either:

(1) an evaluation showing that the maximum dose to a person offsite due to a release of radioactive materials would not exceed 1 rem effective dose equivalent or 5 rems (50 millisieverts) to the thyroid; or

(2) an emergency plan for responding to a release of radioactive material.

B. One or more of the following factors may be used to support an evaluation submitted under Paragraph (1) of Subsection A of this section:

(1) the radioactive material is physically separated so that only a portion could be involved in an accident;

(2) all or part of the radioactive material is not subject to release during an accident because of the way it is stored or packaged;

(3) the release fraction in the respirable size range would be lower than the release fraction shown in 20.3.3.333 NMAC of this part due to the chemical or physical form of the material;

(4) the solubility of the radioactive material would reduce the dose received;

(5) facility design or engineered safety features in the facility would cause the release fraction to be lower than shown in 20.3.3.333 NMAC;

(6) other factors appropriate for the specific facility; or

(7) operating restrictions or procedures would prevent a release fraction as large as that shown in 20.3.3.333 NMAC.

C. An emergency plan for responding to a release of radioactive material submitted under Paragraph (2) of Subsection A of this section must include the following information.

(1) **Facility description:** a brief description of the licensee's facility and area near the site.

(2) **Types of accidents:** an identification of each type of radioactive materials accident for which protective actions may be needed.

(3) **Classification of accidents:** a system for classifying each accident as “alert” or “site area emergencies”.

(4) **Detection of accidents:** identification of the means of detecting each type of accident in a timely manner.

(5) **Mitigation of consequences:** a brief description of the means and equipment for mitigating the consequences of each type of accident, including those provided to protect workers onsite, and a description of the program for maintaining the equipment.

(6) **Assessment of releases:** a brief description of the methods and equipment to assess releases of radioactive materials.

(7) **Responsibilities:** a brief description of the responsibilities of licensee personnel should an accident occur, including identification of personnel responsible for promptly notifying offsite response organizations and the secretary; also responsibilities for developing, maintaining, and updating the plan.

(8) **Notification and coordination:** a commitment to and a brief description of the means to promptly notify offsite response organizations and request offsite assistance, including medical assistance for the treatment of contaminated injured onsite workers when appropriate. A control point must be established. The notification and coordination must be planned so that unavailability of some personnel, parts of the facility, and some equipment will not prevent the notification and coordination. The licensee shall also commit to notify the secretary immediately and ensure notification of other appropriate offsite response organizations “and not later than one hour after the licensee declares an emergency”.

(9) **Information to be communicated:** a brief description of the types of information regarding facility status, radioactive releases and, if necessary, recommended protective actions.

(10) **Training:** a brief description of the frequency, performance objectives and plans for the training that the licensee will provide workers on how to respond to an emergency including any special instructions and orientation tours the licensee would offer to fire, police, medical and other emergency personnel. The training shall familiarize personnel with site-specific emergency procedures. Also, the training shall thoroughly prepare site personnel for their responsibilities in the event of accident scenarios postulated as most probable for the specific site, including the use of team training for such scenarios.

(11) **Safe shutdown:** a brief description of the means of restoring the facility to a safe condition after an accident.

(12) **Exercises:** provisions for conducting quarterly communications checks with offsite response organizations and biennial onsite exercises to test response to simulated emergencies. Quarterly communications checks with offsite response organizations must include the check and update of all necessary telephone numbers. The licensee shall invite offsite response organizations to participate in the biennial exercises. Participation of offsite response organizations in biennial exercises, although recommended, is not required. Exercises must use accident scenarios postulated as most probable for the specific site and the scenarios shall not be known to most exercise participants. The licensee shall critique each exercise using individuals not having direct implementation responsibility for the plan. Critiques of exercises must evaluate the appropriateness of the plan, emergency procedures, facilities, equipment and training of personnel and overall effectiveness of the response. Deficiencies found by the critiques must be corrected.

(13) **Hazardous chemicals:** a certification that the applicant has met its responsibilities under the Emergency Planning and Community Right-to-Know Act (title III, pub. l. 99-499), if applicable to the applicant's activities at the proposed place of use of the radioactive material.

D. The licensee shall allow the offsite response organizations expected to respond in case of an accident 60 days to comment on the licensee's emergency plan before submitting it in final form to the department. The licensee shall provide any comments received within the 60 days to the department with the emergency plan. [20.3.3.309 NMAC - Rp, 20.3.3.309 NMAC, 4/30/2009]

20.3.3.310 PUBLIC NOTICE, PARTICIPATION AND HEARING:

A. Within 60 days following:

(1) initial receipt of a new license application, or each additional submission of information by the applicant, the secretary will either accept the application for a new license for a review and give notice pursuant to Subsection B of this section, or notify the applicant in writing of any deficiencies in the application that must be corrected in order for the application to be accepted for review;

(2) a license amendment or license renewal application requesting a change of the location where radioactive material will be stored or used, the secretary will issue notices pursuant to Subsection B of this section;

(3) a license amendment or license renewal application requesting a change of principal activity, the secretary will issue notices pursuant to Subsection B of this section.

B. Notices. The secretary shall give a notice of acceptance of a new application, license amendment or renewal license application described in Subsection A of this section:

(1) to the applicant, by certified mail; and

(2) to the public, by the publication of a notice in at least one newspaper of general circulation in the area of the proposed activity in the license application, and in other newspapers as deemed appropriate by the secretary;

(3) the secretary shall make a good faith effort to notify of acceptance of a new application, license amendment or renewal license application described in of Subsection A of this section by first-class mail:

(a) any local, state, Indian Tribal government or federal government agency that the secretary determines may be significantly affected or interested; and

(b) any other person who, prior to such notice, has requested in writing such notices.

C. The notice specified in Paragraph (2) of Subsection B of this section shall include:

(1) the name and address of the applicant;

(2) the location of the proposed activity;

(3) a brief description of the procedures to be followed by the secretary in making a final determination;

(4) a brief description of the proposed activity;

(5) the time within which written comments and requests for public hearings will be accepted; and

(6) the means by which interested persons may obtain further information;

(7) the following sample notice satisfies the requirements of this section:

PUBLIC NOTICE

The New Mexico Environment Department (the Department) has received an application for a Radioactive Material License from _____ (company name and address) for

_____ (proposed activity) to be located at _____ (location).

During the early part of the evaluation period, the Department will review and comment upon the application. The NMED may, at its discretion, retain consultants to assist it in its evaluation of the application. Relevant comments and questions received by the NMED from various agencies and interested parties will be forwarded to the applicant for its response. Correspondence associated with the application will be on file with the Radiation Control Bureau and will be available for inspection by the applicant and any other interested parties.

The Department has required the applicant to provide complete plans and other materials addressing, among other things, the public health, safety and environmental aspects of the proposed activity.

The Department will analyze the license application carefully. During this analysis, the application will be reviewed to ensure that there are no deficiencies, that the application meets all applicable requirements and that there is no reason to believe that the operation will violate any laws or regulations. If the Department is so satisfied, it will issue a Radioactive Material License, to expire in five years.

The activities of all licensees are inspected periodically to assure compliance with regulations and license conditions.

The application is available for review at NMED's offices of the Radiation Control Bureau in Santa Fe, New Mexico.

It is anticipated that the review period will require about _____ months. Written comments and requests for public hearing will be accepted for _____ days after publication of this notice.

Written comments regarding this license application should be directed to Radiation Control Bureau, Environment Department, P.O. Box 5469, Santa Fe, New Mexico 87502-5469.

D. The department shall maintain all licensees' administrative record, which shall be available for public inspection at the department office in Santa Fe.

E. Public comment period.

(1) Following the notice pursuant to Subsections B and C of this section and prior to ruling on any new application, or amendment request or renewal license application of the type described in Subsection A of this section, the secretary shall allow for a period of at least 30 days during which written comments or questions about the license application may be submitted by any interested person. If the secretary determines that the

questions are relevant to the requirements in 20.3.3.307 NMAC, 20.3.3.308 NMAC and any specific requirements for the type of license requested, the secretary shall require the applicant to answer them.

(2) Following the notice of acceptance of the license application pursuant to Subsections A through C of this section and prior to ruling on any application required to be accompanied by an environmental report pursuant to Subsection H of 20.3.3.307 NMAC, the secretary shall allow a period of at least 60 days during which written comments or questions may be submitted by any interested person. If the secretary determines that the questions are relevant to the considerations enumerated in Subsection H of 20.3.3.307 NMAC or 20.3.3.308 NMAC, the secretary shall require the applicant to answer them.

The secretary may allow an additional written comment period upon submission of additional information to the license application, amendment request or renewal license application described by Subsection A of this section by the applicant, or upon request by members of the public. A written request for a hearing may be made by the members of the public within the time period specified in the public notice described in Subsection C of this section.

F. If the secretary determines that there is significant public interest, or that there is a need to resolve issues not resolvable in writing, the secretary shall order a public hearing be held to provide guidance on any issue relevant to the license proceeding. Notice of the public hearing shall be given at least 30 days prior to the hearing to the persons and in the manner specified in Subsection C of 20.1.4.200 NMAC. Any such public hearing shall be conducted pursuant to the hearing procedures in 20.1.4 NMAC.

[20.3.3.310 NMAC - Rp, 20.3.3.310 NMAC, 4/30/2009; A, 6/13/2017; A, 8/10/2021]

20.3.3.311 FINANCIAL ASSURANCE AND RECORD KEEPING FOR DECOMMISSIONING:

A. Decommissioning funding plan required.

(1) Each applicant for a specific license authorizing the possession and use of unsealed radioactive material (except source material which is subject to Paragraph (3) of this subsection) of half-life greater than 120 days in quantities exceeding 100,000 (1E+5) times the applicable quantities set forth in 20.3.3.338 NMAC, shall submit a decommissioning funding plan as described in Subsection E of this section. The decommissioning funding plan must also be submitted when a combination of radioisotopes is involved if R divided by 100,000 (1E+5) is greater than 1 (unity rule), where R is defined here as the sum of the ratios of the quantity of each radioisotope to the applicable value in 20.3.3.338 NMAC.

(2) Each applicant for a specific license authorizing the possession and use of sealed sources or plated foils of half-life greater than 120 days and in quantities exceeding 10^{12} (1E+12) times the applicable quantities set forth in 20.3.3.338 NMAC (or when a combination of radioisotopes is involved if R, as defined in Paragraph (1) of this subsection, divided by 10^{12} is greater than 1), shall submit a decommissioning funding plan as described in Subsection E of this section.

(3) Each applicant for a specific license authorizing the possession and use of more than 100 (1E+2) millicuries of source material in a readily dispersible form shall submit a decommissioning funding plan as described in Subsection E of this section.

B. Each applicant for a specific license authorizing possession and use of radioactive material of half-life greater than 120 days and in quantities specified in Subsection D of this section shall either:

(1) submit a decommissioning funding plan as described in Subsection E of this section; or

(2) submit a certification that financial assurance for decommissioning has been provided in the amount prescribed by Subsection D of this section using one of the methods described in Subsection F of this section; for an applicant, this certification may state that the appropriate assurance will be obtained after the application has been approved and the license issued but prior to the receipt of licensed material; if the applicant defers execution of the financial instrument until after the license has been issued, a signed original of the financial instrument obtained to satisfy the requirements of Subsection F of this section must be submitted to the department before receipt of licensed material; if the applicant does not defer execution of the financial instrument, the applicant shall submit to the department, as part of the certification, a signed original of the financial instrument obtained to satisfy the requirements of Subsection F of this section.

C. **Financial assurance for holders of specific license.** Each holder of a specific license issued before the effective date of these regulations which is of a type described in Subsection A or B of this section shall provide financial assurance for decommissioning in accordance with the criteria set forth in this section.

(1) Each holder of a specific license issued before the effective date of these regulations, and of a type described in Subsection A of this section shall submit a decommissioning funding plan as described in Subsection E of this section.

(2) Each holder of a specific license issued before the effective date of these regulations, and of a type described in Subsection B of this section shall submit a decommissioning funding plan as described in

Subsection E of this section, or a certification of financial assurance for decommissioning in accordance with the criteria set forth in Subsection D of this section.

(3) Any licensee who has submitted an application before the effective date of these regulations for renewal of license in accordance with 20.3.3.319 NMAC shall provide financial assurance for decommissioning in accordance with Subsections A and B of this section.

(4) Waste collectors and waste processors, as defined in 20.3.4.466 NMAC, must provide financial assurance in an amount based on a decommissioning funding plan as described in Subsection E of this section. The decommissioning funding plan must include the cost of disposal of the maximum amount (in curies) of radioactive material permitted by license, and the cost of disposal of the maximum quantity, by volume, of radioactive material which could be present at the licensee's facility at any time, in addition to the cost to remediate the licensee's site to meet the license termination criteria of 20.3.4.426 NMAC.

D. Required amounts of financial assurance for decommissioning by quantity of material.

Licensees exceeding the upper bounds of this subsection must base financial assurance on a decommissioning funding plan as described in Subsection E of this section.

(1) Greater than 10,000 (1E+4) but less than or equal to 100,000 (1E+5) times the applicable quantities of 20.3.3.338 NMAC, in unsealed form. (For a combination of radioisotopes, if R as defined in Subsection A of this section, divided by 10,000 (1E+4) is greater than 1 but R divided by 100,000 (1E+5) is less than or equal to 1): at least equal to \$1,125,000.

(2) Greater than 1,000 (1E+3) but less than or equal to 10,000 (1E+4) times the applicable quantities of 20.3.3.338 NMAC, in unsealed form. (For a combination of radioisotopes, if R, as defined in Subsection A of this section, divided by 1,000 (1E+3) is greater than 1 but R divided by 10,000 (1E+4) is less than or equal to 1): at least equal to \$225,000.

(3) Greater than 10^{10} (1E+10) but less than or equal to 10^{12} (1E+12) times the applicable quantities of 20.3.3.338 NMAC, in sealed sources or plated foils. (For a combination of radioisotopes, if R, as defined in Subsection A of this section, divided by 10^{10} is greater than 1, but R divided by 10^{12} is less than or equal to 1): at least equal to \$113,000.

(4) For source material, greater than 10 millicuries but less than or equal to 100 millicuries: at least equal to \$225,000.

E. Decommissioning funding plan.

(1) Each decommissioning funding plan must be submitted for review and approval and must contain a detailed cost estimate for decommissioning in an amount reflecting:

(a) the cost of an independent contractor to perform all decommissioning activities;
(b) the cost of meeting the 20.3.4.426.B NMAC criteria for unrestricted use,
provided that, if the applicant or licensee can demonstrate its ability to meet the provisions of 20.3.4.426.C NMAC, the cost estimate may be based on meeting the 20.3.4.426.C NMAC department approved criteria;

(c) the volume of onsite subsurface material containing residual radioactivity that will require remediation to meet the criteria for license termination;

(d) an adequate contingency factor with identification of and justification for using the key assumptions contained in the decommissioning cost estimate;

(e) a description of the method of assuring funds for decommissioning from 20.3.3.311.F NMAC including means for adjusting cost estimates and associated funding levels periodically over the life of the facility;

(f) a certification by the licensee that financial assurance for decommissioning has been provided in the amount of the cost estimate for decommissioning; and

(g) a signed original of the financial instrument obtained to satisfy the requirement of Subsection F of this section (unless a previously submitted and accepted financial instrument continues to cover the cost estimate for decommissioning).

(2) At the time of license renewal and at intervals not to exceed three years, the decommissioning funding plan must be resubmitted with adjustments as necessary to account for changes in costs and the extent of contamination. If the amount of financial assurance will be adjusted downward, this cannot be done until the updated decommissioning funding plan is approved. The decommissioning funding plan must update the information submitted with the original or prior approved plan, and must specifically consider the effect of the following events on decommissioning costs:

(a) spills of radioactive material producing additional residual radioactivity in onsite subsurface material;

(b) waste inventory increasing above the amount previously estimated;

- (c) waste disposal costs increasing above the amount previously estimated;
- (d) facility modifications;
- (e) changes in authorized possession limits;
- (f) actual remediation costs that exceed the previous cost estimate;
- (g) onsite disposal; and
- (h) use of a settling pond.

F. Methods of financial assurance. Financial assurance for decommissioning must be provided by one or more of the following methods.

(1) **Prepayment.** Prepayment is the deposit prior to the start of operation into an account segregated from licensee assets and outside the licensee's administrative control of cash or liquid assets such that the amount of funds would be sufficient to pay decommissioning costs. Prepayment may be in the form of a trust, escrow account, government fund, certificate of deposit or deposit of government securities.

(2) **A surety method, insurance or other guarantee method.** These methods guarantee that decommissioning costs will be paid. A surety method may be in the form of a surety bond, letter of credit or line of credit. A parent company guarantee of funds for decommissioning costs based on a financial test may be used if the guarantee and test are as contained in 20.3.3.334 NMAC. A parent company guarantee may not be used in combination with other financial methods to satisfy the requirements of this section. For commercial corporations that issue bonds, a guarantee of funds by the applicant or licensee for decommissioning costs based on a financial test may be used if the guarantee and test are as contained in 20.3.3.335 NMAC. For commercial companies that do not issue bonds, a guarantee of funds by the applicant or licensee for decommissioning costs may be used if the guarantee and test are as contained in 20.3.3.336 NMAC. For nonprofit entities, such as colleges, universities and nonprofit hospitals, a guarantee of funds by the applicant or licensee may be used if the guarantee and test are as contained in 20.3.3.337 NMAC. A guarantee by the applicant or licensee may not be used in combination with any other financial methods to satisfy the requirements of this section or in any situation where the applicant or licensee has a parent company holding majority control of the voting stock of the company. Any surety method or insurance used to provide financial assurance for decommissioning must contain the following conditions.

(a) The surety method or insurance must be open-ended or, if written for a specified term, such as five years, must be renewed automatically unless 90 days or more prior to the renewal date, the issuer notifies the department, the beneficiary, and the licensee of its intention not to renew. The surety method or insurance must also provide that the full face amount be paid to the beneficiary automatically prior to the expiration without proof of forfeiture if the licensee fails to provide a replacement acceptable to the department within 30 days after receipt of notification of cancellation.

(b) The surety method or insurance must be payable to a trust established for decommissioning costs. The trustee and trust must be acceptable to the department. An acceptable trustee includes an appropriate state or federal government agency or an entity which has the authority to act as a trustee and whose trust operations are regulated and examined by a federal or state agency.

(c) The surety method or insurance must remain in effect until the department has terminated the license.

(3) **An external sinking fund in which deposits are made at least annually, coupled with a surety method or insurance, the value of which may decrease by the amount being accumulated in the sinking fund.** An external sinking fund is a fund established and maintained by setting aside funds periodically in an account segregated from licensee assets and outside the licensee's administrative control in which the total amount of funds would be sufficient to pay decommissioning costs at the time termination of operation is expected. An external sinking fund may be in the form of a trust, escrow account, government fund, certificate of deposit, or deposit of government securities. The surety or insurance provisions must be as stated in Paragraph (2) of this subsection.

(4) In the case of federal, state or local government licensees, a statement of intent containing a cost estimate for decommissioning or an amount based on Subsection D of this section, and indicating that funds for decommissioning will be obtained when necessary.

(5) When a governmental entity is assuming custody and ownership of a site, an arrangement that is deemed acceptable by such governmental entity.

G. Record keeping requirements. Each person licensed under this part or Parts 5, 7, 12, 13 and 15 of this chapter shall keep records of information important to the decommissioning of the facility in an identified location until the site is released for unrestricted use. Before licensed activities are transferred or assigned in accordance with 20.3.3.317 NMAC, licensees shall transfer all records described in this paragraph to the new licensee. In this case, the new licensee will be responsible for maintaining these records until the license is

terminated. If records important to the decommissioning of a facility are kept for other purposes, reference to these records and their locations may be used. Information the department considers important to decommissioning consists of:

- (1) records of spills or other unusual occurrences involving the spread of contamination in and around the facility, equipment or site; these records may be limited to instances when contamination remains after any cleanup procedures or when there is reasonable likelihood that contaminants may have spread to inaccessible areas as in the case of possible seepage into porous materials such as concrete; these records must include any known information on identification of involved nuclides, quantities, forms and concentrations;
 - (2) as-built drawings and modifications of structures and equipment in restricted areas where radioactive materials are used or stored, and of locations of possible inaccessible contamination such as buried pipes which may be subject to contamination; if required drawings are referenced, each relevant document need not be indexed individually; if drawings are not available, the licensee shall substitute appropriate records of available information concerning these areas and locations;
 - (3) except for areas containing only sealed sources (provided the sources have not leaked or no contamination remains after any leak) or radioactive materials having only half-lives of less than 65 days, a list contained in a single document and updated every two years, of the following:
 - (a) all areas designated and formerly designated restricted areas as defined in 20.3.4.7 NMAC;
 - (b) all areas outside of restricted areas that require documentation under Paragraph (1) of this subsection;
 - (c) all areas outside of restricted areas where current and previous wastes have been buried as documented under 20.3.4.448 NMAC; and
 - (d) all areas outside of restricted areas that contain material such that, if the license expired, the licensee would be required to either decontaminate the area to meet the criteria for decommissioning in 20.3.4.426 NMAC, or apply for approval for disposal under 20.3.4.434 NMAC; and
 - (4) records of the cost estimate performed for the decommissioning funding plan or of the amount certified for decommissioning, and records of the funding method used for assuring funds if either a funding plan or certification is used.
- [20.3.3.311 NMAC - Rp, 20.3.3.311 NMAC, 4/30/2009; A, 6/13/2017]

20.3.3.312 [RESERVED]

20.3.3.313 SPECIAL REQUIREMENTS FOR ISSUANCE OF CERTAIN SPECIFIC LICENSES FOR RADIOACTIVE MATERIAL:

- A. Industrial radiographic operations.** In addition to the requirements set forth in 20.3.3.307 NMAC and 20.3.3.308 NMAC, a specific license for use of sealed sources in industrial radiography will be issued if the applicant or licensee meets the specific requirements in 20.3.5 NMAC.
 - B. Medical use of radioactive materials.** In addition to the requirements set forth in 20.3.3.307 NMAC and 20.3.3.308 NMAC, a specific license for use of sealed sources and unsealed radioactive materials for medical use will be issued if the applicant or licensee meets the specific requirements in 20.3.7 NMAC.
 - C. Well logging operations and subsurface tracer studies.** In addition to the requirements set forth in 20.3.3.307 NMAC and 20.3.3.308 NMAC, a specific license for use of sealed sources in wireline service operations, including mineral-logging, radioactive markers or subsurface tracer studies will be issued if the applicant or licensee meets the specific requirements in 20.3.12 NMAC.
 - D. Land disposal of radioactive waste.** In addition to the requirements set forth in 20.3.3.308 NMAC, a specific license for any method of land disposal of low-level radioactive waste will be issued if the applicant or licensee meets the specific requirements in 20.3.13 NMAC.
 - E. Naturally occurring radioactive materials in the oil and gas industry.** In addition to the requirements set forth in 20.3.3.308 NMAC, a specific license for use of naturally occurring radioactive materials (NORM) in the gas and oil industry will be issued if the applicant or licensee meets the specific requirements in 20.3.14 NMAC.
 - F. Irradiators.** In addition to the requirements set forth in 20.3.3.307 NMAC and 20.3.3.308 NMAC, a specific license for use of sealed sources in irradiators will be issued if the applicant or licensee meets the specific requirements in 20.3.15 NMAC.
- [20.3.3.313 NMAC - Rp, 20.3.3.313 NMAC, 4/30/2009; A, 6/13/2017]

20.3.3.314 SPECIAL REQUIREMENTS FOR SPECIFIC LICENSES OF BROAD SCOPE: This section prescribes requirements for the issuance of specific licenses of broad scope for radioactive material ("broad licenses") and certain regulations governing holders of such licenses.

A. Types of specific licenses of broad scope.

(1) A "type A specific license of broad scope" is a specific license authorizing receipt, acquisition, ownership, possession, use and transfer of any chemical or physical form of the radioactive material specified in the license, but not exceeding quantities specified in the license, for purposes authorized by the act. The quantities specified are usually in the multicurie range.

(2) A "type B specific license of broad scope" is a specific license authorizing receipt, acquisition, ownership, possession, use and transfer of any chemical or physical form of radioactive material specified in 20.3.3.332 NMAC, for purposes authorized by the act. The possession limit for a type B broad license, if only one radionuclide is possessed thereunder, is the quantity specified for that radionuclide in column I of 20.3.3.332 NMAC. If two or more radionuclides are possessed thereunder, the possession limit for each is determined as follows: for each radionuclide determine the ratio of the quantity possessed to the applicable quantity specified in column I of 20.3.3.332 NMAC, for that radionuclide. The sum of the ratios for all radionuclides possessed under the license shall not exceed unity.

(3) A "type C specific license of broad scope" is a specific license authorizing receipt, acquisition, ownership, possession, use and transfer of any chemical or physical form of radioactive material specified in 20.3.3.332 NMAC, for any purposes authorized by the act. The possession limit for a type C broad license, if only one radionuclide is possessed thereunder, is the quantity specified for that radionuclide in column II of 20.3.3.332 NMAC. If two or more radionuclides are possessed thereunder, the possession limit is determined for each as follows:

(a) for each radionuclide determine the ratio of the quantity possessed to the applicable quantity specified in Column II of 20.3.3.332 NMAC, for the radionuclide; and

(b) the sum of the ratios for all radionuclides possessed under the license shall not exceed unity.

B. Requirements for the issuance of a type A specific license of broad scope. An application for a type A specific license of broad scope will be approved if the following requirements are met.

(1) The applicant satisfies the general requirements specified in 20.3.3.307 NMAC and 20.3.3.308 NMAC.

(2) The applicant has engaged in a reasonable number of activities involving the use of radioactive materials.

(3) The applicant has established administrative controls and provisions relating to organization and management, procedures, record keeping, material control, material accounting and management review that are necessary to assure safe operations, including:

(a) the establishment of a radiation safety committee composed of such persons as a radiation safety officer, a representative of management, and persons trained and experienced in the safe use of radioactive material;

(b) the appointment of a radiation safety officer who is qualified by training and experience in radiation protection and who is available for advice and assistance on radiation safety matters; and

(c) the establishment of appropriate administrative procedures to assure:

(i) control of procurement and use of radioactive material;

(ii) completion of safety evaluations of proposed uses of radioactive material which take into consideration such matters as the adequacy of facilities and equipment, training and experience of the user and the operating or handling procedures; and

(iii) review, approval and recording by the radiation safety committee of safety evaluation of proposed uses prepared in accordance with Item (ii) of this subparagraph prior to use of the radioactive material.

C. Requirements for the issuance of a type B specific license of broad scope. An application for a type B specific license of broad scope will be approved if the following requirements are met.

(1) The applicant satisfies the general requirements specified in 20.3.3.307 NMAC and 20.3.3.308 NMAC.

(2) The applicant has established administrative controls and provisions relating to organization and management, procedures, record keeping, material control, material accounting and management review that are necessary to assure safe operations, including:

(a) the appointment of a radiation safety officer who is qualified by training and

experience in radiation protection and who is available for advice and assistance on radiation safety matters; and

(b) the establishment of appropriate administrative procedures to assure:

(i) control of procurement and use of radioactive material;

(ii) completion of safety evaluations of proposed uses of radioactive materials which take into consideration such matters as the adequacy of facilities and equipment, training and experience of the user, and the operating or handling procedures; and

(iii) review, approval and recording by the radiation safety officer of safety evaluations of proposed uses prepared in accordance with Item (ii) of this subparagraph.

D. Requirements for the issuance of a type C specific license of broad scope. An application for a type C specific license of broad scope will be approved if the following requirements are met.

(1) The applicant satisfies the general requirements specified in 20.3.3.307 NMAC and 20.3.3.308 NMAC.

(2) The applicant submits a statement that radioactive material will be used only by, or under the direct supervision of, individuals who have received:

(a) a college degree at the bachelor level, or equivalent training and experience, in the physical or biological sciences or in engineering; and

(b) at least 40 hours of training and experience in the safe handling of radioactive materials, and in the characteristics of ionizing radiation, units of radiation dose and quantities, radiation detection instrumentation and biological hazards of exposure to radiation appropriate to the type and forms of radioactive material to be used.

(3) The applicant has established administrative controls and provisions relating to procurement of radioactive material, procedures, record keeping, material control, material accounting and management review necessary to assure safe operations.

E. Conditions of specific licenses of broad scope.

(1) Unless specifically authorized pursuant to other parts of this chapter, persons licensed under this section shall not:

(a) conduct tracer studies in the environment involving direct release of radioactive material;

(b) receive, acquire, own, possess, use, transfer or import devices containing 100,000 curies or more of radioactive material in sealed sources used for irradiation of material;

(c) conduct activities for which a specific license issued by the department under 20.3.5 NMAC, 20.3.7 NMAC or 20.3.3.315 NMAC is required; or

(d) add or cause the addition of radioactive material to any food, beverage, cosmetic, drug or other product designed for ingestion or inhalation by, or application to, a human being.

(2) Each type A specific license of broad scope issued under this section shall be subject to the condition that radioactive material possessed under the license shall only be used by, or under the direct supervision of, individuals approved by the licensee's radiation safety committee.

(3) Each type B specific license of broad scope issued under this section shall be subject to the condition that radioactive material possessed under the license shall only be used by, or under the direct supervision of, individuals approved by the licensee's radiation safety officer.

(4) Each type C specific license of broad scope issued under this section shall be subject to the condition that radioactive material possessed under the license shall only be used by, or under the direct supervision of, individuals who satisfy the requirements of Paragraph (2) of Subsection D of this section. [20.3.3.314 NMAC - Rp, 20.3.3.314 NMAC, 4/30/2009; A, 6/13/2017]

20.3.3.315 SPECIAL REQUIREMENTS FOR A SPECIFIC LICENSE TO MANUFACTURE, ASSEMBLE, REPAIR OR DISTRIBUTE COMMODITIES, PRODUCTS OR DEVICES WHICH CONTAIN RADIOACTIVE MATERIAL:

A. Introduction of radioactive material in exempt concentrations into products or materials.

(1) **Licensing.** A specific license authorizing the introduction of radioactive material into a product or material owned by or in the possession of the licensee or another and the transfer of ownership or possession of the product or material containing the radioactive material to be transferred to persons exempt under Paragraph (1) of Subsection A of 20.3.3.302 NMAC will be issued by NRC pursuant to 10 CFR 32.11.

(2) **Prohibition of introduction.** 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 Subsection A of 20.3.3.302 NMAC or equivalent regulations of the NRC or an agreement state, except in

accordance with a license issued by NRC pursuant to 10 CFR 32.11.

B. Radioactive material in exempt quantities or in certain items.

(1) Manufacture, distribution and transfer of exempt quantities of byproduct material.

An application for a specific license to manufacture, process, produce, package, repack or transfer exempt quantities of byproduct material for commercial distribution to persons exempt pursuant to Subsection B of 20.3.3.302 NMAC or the equivalent regulations of the NRC or an agreement state shall be issued by NRC pursuant to 10 CFR 32.18.

(2) Certain items containing byproduct material. An application for a specific license to apply byproduct material to, or to incorporate byproduct material into, the products specified in Paragraph (1) of Subsection C of 20.3.3.302 NMAC or to initially transfer for sale or distribution such products containing byproduct material for use pursuant to Paragraph (1) of Subsection C of 20.3.3.302 NMAC to persons exempt from 20.3 NMAC shall be submitted to NRC pursuant to 10 CFR 32.14.

(3) Except as specified in Paragraphs (1) and (2) of this subsection, in addition to the requirements set forth in 20.3.3.308 NMAC, an application for a specific license to manufacture, process, produce, package, repack or initially transfer naturally occurring or accelerator produced radioactive material (NARM) in exempt quantities as specified in 20.3.3.330 NMAC of this part to persons exempt from licensing pursuant to Subsection B of 20.3.3.302 NMAC will be approved if:

(a) the radioactive material is not contained in any food, beverage, cosmetic, drug or other commodity designed for ingestion or inhalation by, or application to, a human being;

(b) the radioactive material is in the form of processed chemical elements, compounds, mixtures, tissue samples, bioassay samples, counting standards, plated or encapsulated sources, or similar substances, identified as radioactive and to be used for its radioactive properties, but is not incorporated into any manufactured or assembled commodity, product or device intended for commercial distribution; and

(c) the applicant submits copies of prototype labels and brochures and the department approves such labels and brochures.

(4) The license issued under Paragraph (3) of Subsection B of this subsection is subject to the following conditions:

(a) no more than 10 exempt quantities shall be sold or transferred in any single transaction; however, an exempt quantity may be composed of fractional parts of one or more of the exempt quantity provided the sum of the fractions shall not exceed unity;

(b) each exempt quantity shall be separately and individually packaged; no more than 10 such packaged exempt quantities shall be contained in any outer package for transfer to persons exempt pursuant to Subsection B of 20.3.3.302 NMAC; the outer package shall be such that the dose rate at the external surface of the package does not exceed 0.5 millirem per hour;

(c) the immediate container of each quantity or separately packaged fractional quantity of radioactive material shall bear a durable and legible label which:

(i) identifies the radionuclide and the quantity of radioactivity; and

(ii) bears the words “radioactive material”; and

(d) in addition to the labeling information required by Subparagraph (c) of this paragraph, the label affixed to the immediate container, or an accompanying brochure shall

(i) state that the contents are exempt from these regulations;

(ii) bear the words “radioactive material - not for human use - introduction into foods, beverages, cosmetics, drugs or medicinal product, or into products manufactured for commercial distribution is prohibited - exempt quantities shall not be combined”; and

(iii) set forth appropriate additional radiation safety precautions and instructions relating to the handling, use, storage and disposal of the radioactive material.

(5) Each person licensed under Subsection B of 20.3.3.315 NMAC shall maintain records identifying, by name and address, each person to whom radioactive material is transferred for use under Subsection B of 20.3.3.302 NMAC and stating the kinds and quantities of radioactive material transferred. An annual summary report stating the total quantity of each radionuclide transferred under the specific license shall be filed with the department. Each report shall cover the year ending June 30 and shall be filed within 30 days thereafter. If no transfers of radioactive material have been made pursuant to Subsection B of 20.3.3.315 NMAC, during the report period, the report shall so indicate.

C. Licensing of byproduct material by NRC.

(1) Gas and aerosol detectors. An application for a specific license to manufacture, process or produce gas and aerosol detectors containing byproduct material and designed to protect life or property from

fires and airborne hazards, or to initially transfer such products for use pursuant to Paragraph (4) of Subsection C of 20.3.3.302 NMAC or equivalent regulations of the NRC or an agreement state, shall be submitted to NRC pursuant to 10 CFR 32.26.

(2) **Self-luminous products.** An application for a specific license to manufacture, process or produce self-luminous products containing tritium, krypton-85, promethium-147 or radium-226, or to initially transfer such products for use pursuant to Paragraph (2) of Subsection C of 20.3.3.302 NMAC or equivalent regulations of the NRC or an agreement state, shall be submitted to NRC pursuant to 10 CFR 32.22 and for distribution submit to the NRC pursuant to 10 CFR 32.53.

(3) **Capsules containing carbon-14.** An application for a specific license to manufacture, prepare, process, produce, package, repackage or transfer for commercial distribution capsules containing 1 microcurie (37 kilobecquerels) carbon-14 urea (allowing for nominal variation that may occur during the manufacturing process) each for *in vivo* diagnostic use, to persons exempt from licensing under Subsection D of 20.3.3.302 NMAC or the equivalent regulations of the NRC or an agreement state shall be submitted to NRC pursuant to 10 CFR 32.21.

D. [Reserved]

E. **Licensing the manufacture and distribution of devices to persons generally licensed under Subsection B of 20.3.3.305 NMAC.**

(1) **Requirements for approval of a license application.** An application for a specific license to manufacture or initially transfer devices containing radioactive material to persons generally licensed under Subsection B of 20.3.3.305 NMAC or equivalent regulations of the NRC or an agreement state will be approved if:

(a) the applicant satisfies the general requirements of 20.3.3.308 NMAC;
(b) the applicant submits sufficient information relating to the design, manufacture, prototype testing, quality control, labels, proposed uses, installation, servicing, leak testing, operating and safety instructions and potential hazards of the device to provide reasonable assurance that:

(i) the device can be safely operated by persons not having training in radiological protection;
(ii) under ordinary conditions of handling, storage and use of the device, the radioactive material contained in the device will not be released or inadvertently removed from the device, and it is unlikely that any person will receive in one year a dose in excess of ten percent of the limits specified in Subsection A of 20.3.4.405 NMAC; and

(iii) under accident conditions (such as fire and explosion) associated with handling, storage and use of the device, it is unlikely that any person would receive an external radiation dose or dose commitment in excess of the following organ doses: 1) whole body, head and trunk, active blood-forming organs, gonads or lens of eye: 15 rems (150 millisieverts); 2) hands and forearms, feet and ankles, and localized areas of skin averaged over areas no larger than 1 square centimeter: 200 rems (2 sieverts); and 3) other organs: 50 rems (500 millisieverts);

(c) each device bears a durable, legible, clearly visible label or labels approved by the department, which contain in a clearly identified and separate statement:

(i) instructions and precautions necessary to assure safe installation, operation and servicing of the device (documents such as operating and service manuals may be identified in the label and used to provide this information);

(ii) the requirement, or lack of requirement, for leak testing, or for testing any on-off mechanism and indicator, including the maximum time interval for such testing, and the identification of radioactive material by isotope, quantity of radioactivity; and date of determination of the quantity; and

(iii) the information called for in the following statement in the same or substantially similar form:

The receipt, possession, use and transfer of this device model _____, serial number _____, are subject to general license or the equivalent and the regulations of the United States nuclear regulatory commission or a state with which the nuclear regulatory commission has entered into an agreement for the exercise of regulatory authority. This label shall be maintained on the device in a legible condition. Removal of this label is prohibited. The model, serial number, and name of manufacturer or distributor may be omitted from this label provided this information is specified elsewhere in labeling affixed.

Caution-radioactive material

(name of manufacturer or distributor)

(d) each device having a separable source housing that provides the primary shielding for the source also bears, on the source housing, a durable label containing the device model number and serial number, the isotope and quantity, the words, “*caution-radioactive material*,” the radiation symbol described in 20.3.4.427 NMAC, and the name of the manufacturer or initial distributor; and

(e) each device meeting the criteria of Item (i) in Subparagraph (m) of Paragraph (3) of Subsection B of 20.3.3.305 NMAC, bears a permanent (e.g., embossed, etched, stamped or engraved) label affixed to the source housing if separable, or the device if the source housing is not separable, that includes the words, “*caution-radioactive material*,” and, if practicable, the radiation symbol described in 20.3.4.427 NMAC.

(f) The device has been registered in the Sealed Source and Device Registry.

(2) **Requests for lengthening of test intervals:** In the event the applicant desires that the device be required to be tested at longer intervals than six months, either for proper operation of the on-off mechanism and indicator, if any, or for leakage of radioactive material or for both, the applicant shall include in its application sufficient information to demonstrate that such longer interval is justified by performance characteristics of the device or similar devices and by design features which have a significant bearing on the probability or consequences of leakage of radioactive material from the device or failure of the on-off mechanism and indicator. In determining the acceptable interval for the test for leakage of radioactive material, the department will consider information which includes, but is not limited to:

(a) primary containment (source capsule);

(b) protection of primary containment;

(c) method of sealing containment;

(d) containment construction materials;

(e) form of contained radioactive material;

(f) maximum temperature withstood during prototype test;

(g) maximum pressure withstood during prototype test;

(h) maximum quantity of contained radioactive material;

(i) radiotoxicity of contained radioactive material; and

(j) operating experience with identical devices or similarly designed and

constructed devices.

(3) **Authorizations for general licensees to perform certain activities.** In the event the applicant desires that the general licensee under Subsection B of 20.3.3.305 NMAC, or under equivalent regulations of the NRC or an agreement state, be authorized to install the device, collect the sample to be analyzed by a specific licensee for leakage of radioactive material, service the device, test the on-off mechanism and indicator or remove the device from installation, the applicant shall include in its application written instructions to be followed by the general licensee, estimated calendar quarter doses associated with such activity or activities and the bases for such estimates. The submitted information must demonstrate that performance of such activity or activities by an individual untrained in radiological protection, in addition to other handling, storage and use of devices under the general license, is unlikely to cause that individual to receive a yearly dose in excess of ten percent of the limits specified in Subsection A of 20.3.4.405 NMAC.

(4) **Transfer provisions:**

(a) [Reserved]

(b) If radioactive material is to be transferred in a device for use under an equivalent general license of the NRC or an agreement state, each person that is licensed under this subsection shall provide the information specified in this subparagraph to each person to whom a device is to be transferred. This information shall be provided before the device may be transferred. In the case of a transfer through an intermediate person, the information shall also be provided to the intended user prior to initial transfer to the intermediate person. The required information includes:

(i) a copy of the NRC’s or agreement state’s regulations equivalent to Subsection B of 20.3.3.305 NMAC, Subsection F of 20.3.3.317 NMAC, 20.3.3.326 NMAC, 20.3.4.451 NMAC, and 20.3.4.452 NMAC or a copy of 10 CFR Sections 31.5, 31.2, 30.51, 20.2201 and 20.2202; if a copy of the NRC regulations is provided to a prospective general licensee in lieu of the agreement state’s regulations, it shall be accompanied by a note explaining that use of the device is regulated by the agreement state; if certain paragraphs of the regulations do not apply to the particular device, those paragraphs may be omitted;

(ii) a list of the services that can only be performed by a specific licensee;

(iii) information on acceptable disposal options including estimated costs of disposal; and

(iv) the name or title, address and phone number of the contact at the

1 agreement state regulatory agency from which additional information may be obtained.

2 (c) An alternative approach to informing customers may be proposed by the
3 licensee for approval by the department.

4 (d) Each device shall meet the labeling requirements in Subparagraphs (c) through
5 (e) of Paragraph (1) of this Subsection.

6 (e) If a notification of bankruptcy is submitted under Subsection E of 20.3.3.317
7 NMAC of this part and each specific licensee or the license is to be terminated, each person licensed under
8 Paragraph (1) of this subsection shall provide, upon request, to the department, NRC and any agreement state,
9 records of final disposition required under 10 CFR30.34(h).

10 (5) **Material transfer reports and records:** Each person licensed under 20.3.3.305 NMAC
11 of this subsection to initially transfer devices to generally licensed persons shall comply with the requirements of
12 this section.

13 (a) The person shall report to the department in accordance with 20.3.1.116 NMAC,
14 all transfers of such devices to persons for use under the general license in Subsection B of 20.3.3.305 NMAC and
15 all receipts of devices from persons licensed under Subsection B of 20.3.3.305 NMAC. The report shall be clear and
16 legible, submitted on a quarterly basis containing all of the following data.

17 (i) The required information for transfers to general licensees includes: 1)
18 the identity of each general licensee by name and mailing address for the location of use; if there is no mailing
19 address for the location of use, an alternate address for the general licensee shall be submitted along with
20 information on the actual location of use; 2) the name, title and phone number of the person identified by the general
21 licensee as having knowledge of and authority to take required actions to ensure compliance with the appropriate
22 regulations and requirements; 3) the date of transfer; 4) the type, model number, and serial number of the device
23 transferred; and 5) the quantity and type of radioactive material contained in the device.

24 (ii) If one or more intermediate persons will temporarily possess the device
25 at the intended place of use before its possession by the user, the report shall include the same information for both
26 the intended user and each intermediate person, and clearly designate the intermediate person(s).

27 (iii) For devices received from a person licensed pursuant to Subsection B
28 of 20.3.3.305 NMAC, the report shall include the identity of the general licensee by name and address, the type,
29 model number, and serial number of the device received, the date of receipt, and, in the case of devices not initially
30 transferred by the reporting licensee, the name of the manufacturer or initial transferor.

31 (iv) If the licensee makes changes to a device possessed by a person
32 licensed pursuant to Subsection B of 20.3.3.305 NMAC, such that the label must be changed to update required
33 information, the report shall identify the general licensee, the device and the changes to information on the device
34 label.

35 (v) The report shall cover each calendar quarter, shall be filed within 30
36 days of the end of the calendar quarter, and shall clearly indicate the period covered by the report.

37 (vi) The report shall clearly identify the specific licensee submitting the
38 report and include the license number of the specific licensee.

39 (vii) If no transfers have been made to or from persons generally licensed
40 under Subsection B of 20.3.3.305 NMAC during the reporting period, the report shall so indicate.

41 (b) The person shall report all transfers of devices to persons for use under a general
42 license under NRC's or an agreement state's regulations that are equivalent to Subsection B of 20.3.3.305 NMAC,
43 and all receipts of devices from general licensees in the NRC's or agreement state's jurisdiction, to the responsible
44 NRC or agreement state agency. The report shall be clear and legible, containing all of the data required as
45 described below.

46 (i) The required information for transfers to general licensees includes: 1)
47 the identity of each general licensee by name and mailing address for the location of use; if there is no mailing
48 address for the location of use, an alternate address for the general licensee shall be submitted along with
49 information on the actual location of use; 2) the name, title and phone number of the person identified by the general
50 licensee as having knowledge of and authority to take required actions to ensure compliance with the appropriate
51 regulations and requirements; 3) the date of transfer; 4) the type, model number and serial number of the device
52 transferred; and 5) the quantity and type of radioactive material contained in the device.

53 (ii) If one or more intermediate persons will temporarily possess the device
54 at the intended place of use before its possession by the user, the report shall include the same information for both
55 the intended user and each intermediate person, and clearly designate the intermediate person(s).

56 (iii) For devices received from a general licensee, the report shall include

the identity of the general licensee by name and address, the type, model number, serial number of the device received, the date of receipt, and, in the case of devices not initially transferred by the reporting licensee, the name of the manufacturer or initial transferor.

(iv) If the licensee makes changes to a device possessed by a general licensee, such that the label must be changed to update required information, the report shall identify the general licensee, the device and the changes to information on the device label.

(v) The report shall cover each calendar quarter, shall be filed within 30 days of the end of the calendar quarter, and shall clearly indicate the period covered by the report.

(vi) The report shall clearly identify the specific licensee submitting the report and must include the license number of the specific licensee.

(vii) If no transfers have been made to or from NRC or a particular agreement state during the reporting period, this information shall be reported to NRC or the responsible agreement state agency upon request of the agency.

(c) The person shall maintain all information concerning transfers and receipts of devices that supports the reports required by Subparagraphs (a) and (b) of this paragraph. Records required by this paragraph shall be maintained for a period of three years following the date of the recorded event.

F. Special requirements for the manufacture, assembly, repair or initial transfer of luminous safety devices for use in aircraft. An application for a specific license to manufacture, assemble, repair or initially transfer luminous safety devices containing tritium or promethium-147 for use in aircraft, for distribution to persons generally licensed under Subsection C of 20.3.3.305 NMAC will be approved subject to the following conditions:

(1) the applicant satisfies the general requirements specified in 20.3.3.308 NMAC;

(2) the applicant satisfies the requirements of 10 CFR 32.53, 10 CFR 32.54, 10 CFR 32.55 and 10 CFR 32.56 or their equivalent;

(3) each person licensed under 10 CFR 32.53 shall file an annual report with the director, office of Nuclear Materials Safety and Safeguards, ATTN: document control desk/GLTS by an appropriate method listed in 10 CFR 30.6(a) which must state the total quantity of tritium or promethium-147 transferred to persons generally licensed under 10 CFR 31.7. The report must identify each general licensee by name, state the kinds and number of luminous devices transferred, and specify the quantity of tritium or promethium-147 in each kind of device. Each report must cover the year ending June 30 and must be filed within 30 days thereafter. If no transfers have been made to persons generally licensed under 10 CFR 31.7 during the reporting period, the report must so indicate; and

(4) each person licensed under 10 CFR 32.53 shall report annually all transfers of devices to persons for use under a general license in an agreement state's regulations that are equivalent to 10 CFR 31.7 of this paragraph to the responsible agreement state agency. The report must state the total quantity of tritium or promethium-147 transferred, identify each general licensee by name, state the kinds and numbers of luminous devices transferred, and specify the quantity of tritium or promethium-147 in each kind of device. If no transfers have been made to a particular agreement state during the reporting period, this information must be reported to the responsible agreement state agency upon request of the agency.

G. Special requirements for license to manufacture or initially transfer calibration or reference sources containing americium-241, plutonium or radium-226 for distribution to persons generally licensed under Subsection D of 20.3.3.305 NMAC. An application for a specific license to manufacture or initially transfer calibration or reference sources containing americium-241, plutonium or radium-226 for distribution to persons generally licensed under Subsection D of 20.3.3.305 NMAC will be approved subject to the following conditions:

(1) the applicant satisfies the general requirements of 20.3.3.307 NMAC and 20.3.3.308 NMAC, and

(2) the applicant satisfies the requirements of 10 CFR 32.57, 10 CFR 32.58, 10 CFR 32.59 and 10 CFR 70.39 or their equivalent.

H. Manufacture and distribution of radioactive material for certain in-vitro clinical or laboratory testing under general license. An application for a specific license to manufacture or distribute radioactive material for use under the general license of Subsection F of 20.3.3.305 NMAC will be approved if:

(1) the applicant satisfies the general requirements specified in 20.3.3.307 NMAC and 20.3.3.308 NMAC;

(2) the radioactive material is to be prepared for distribution in prepackaged units of:

(a) iodine-125 in units not exceeding 10 microcuries (370 kilobecquerels) each;

(b) iodine-131 in units not exceeding 10 microcuries (370 kilobecquerels) each;

(c) carbon-14 in units not exceeding 10 microcuries (370 kilobecquerels) each;

(d) hydrogen-3 (tritium) in units not exceeding 50 microcuries (1.85 megabecquerels) each;

(e) iron-59 in units not exceeding 20 microcuries (740 kilobecquerels) each;

(f) cobalt-57 in units not exceeding 10 microcuries (370 kilobecquerels) each;

(g) selenium-75 in units not exceeding 10 microcuries (370 kilobecquerels) each; or

(h) mock iodine-125 reference or calibration sources in units not exceeding 0.05 microcurie (1.85 kilobecquerels) of iodine-129 and 0.005 microcurie (185 becquerels) of americium-241 each;

(3) each prepackaged unit bears a durable, clearly visible label:

(a) identifying the radioactive contents as to chemical form and radionuclide, and indicating that the amount of radioactivity does not exceed 10 microcuries (370 kilobecquerels) of iodine-125, iodine-131, carbon-14, cobalt-57 or selenium-75; 50 microcuries (1.85 megabecquerels) of hydrogen-3 (tritium); 20 microcuries (740 kilobecquerels) of iron-59; or 0.05 microcurie (1.85 kilobecquerels) of iodine-129 and 0.005 microcurie (185 becquerels) of americium-241; and

(b) displaying the radiation caution symbol described in Paragraph (1) of Subsection A of 20.3.4.427 NMAC and the words, “caution, radioactive material” and “not for internal or external use in humans or animals”;

(4) the following statement, or a substantially similar statement which contains the information called for in the following statement, appears on a label affixed to each prepackaged unit or appears in a leaflet or brochure which accompanies the package:

This radioactive material may be received, acquired, possessed, and used only by physicians, veterinarians, clinical laboratories or hospitals and only for in-vitro clinical or laboratory tests not involving internal or external administration of the material, or the radiation therefrom, to human beings or animals. Its receipt, acquisition, possession, use, and transfer are subject to the regulations and a general license of the United States nuclear regulatory commission or of a state with which the NRC has entered into an agreement for the exercise of regulatory authority.

(name of manufacturer); and

(5) the label affixed to the unit, or the leaflet or brochure which accompanies the package, contains adequate information as to the precautions to be observed in handling, storing and disposal of such radioactive material; in the case of the mock iodine-125 reference or calibration source, the information accompanying the source must also contain directions to the licensee regarding the waste disposal requirements set out in 20.3.4.433 NMAC.

I. Licensing the manufacture and distribution of ice detection devices. An application for a specific license to manufacture and distribute ice detection devices to persons generally licensed under Subsection G of 20.3.3.305 NMAC will be approved subject to the following conditions:

(1) the applicant satisfies the general requirements of 20.3.3.307 NMAC and 20.3.3.308 NMAC; and

(2) the criteria of 10 CFR 32.61 and 32.62 are met.

J. Manufacture, preparation or transfer for commercial distribution of radioactive drugs containing byproduct material for medical use under 20.3.7 NMAC.

(1) An application for a specific license to manufacture, prepare or transfer for commercial distribution, radioactive material for use by persons authorized pursuant to 20.3.7 NMAC will be approved if the following conditions are met.

(a) The applicant satisfies the general requirements specified in 20.3.3.307 NMAC and 20.3.3.308 NMAC;

(b) The applicant submits evidence that the applicant is at least one of the following:

(i) registered with the FDA as the owner or operator of a drug establishment that engages in the manufacture, preparation, propagation, compounding or processing of a drug under ~~[21 CFR 207.20(a)]~~ 21 CFR 207.17(a);

(ii) registered or licensed with a state agency as a drug manufacturer;

(iii) licensed as a pharmacy by a state board of pharmacy;

(iv) operating as a nuclear pharmacy within a federal medical institution; or

(v) a PET drug production facility registered with a state agency.

(c) The applicant submits information on the radionuclide; the chemical and physical form; the maximum activity per vial, syringe, generator, or other container of the radioactive drug; and the

shielding provided by the packaging to show it is appropriate for the safe handling and storage of the radioactive drugs by medical use licensees.

(d) The applicant commits to the following labeling requirements.

(i) A label is affixed to each transport radiation shield, whether it is constructed of lead, glass, plastic or other material, of a radioactive drug to be transferred for commercial distribution; the label must include the radiation symbol and the words “*caution, radioactive material*” or “*danger, radioactive material*”; the name of the radioactive drug or its abbreviation; and the quantity of radioactivity at a specified date and time. For radioactive drugs with a half-life greater than 100 days, the time may be omitted; and

(ii) A label is affixed to each syringe, vial or other container used to hold a radioactive drug to be transferred for commercial distribution; the label must include the radiation symbol and the words “*caution, radioactive material*” or “*danger, radioactive material*” and an identifier that ensures that the syringe, vial or other container can be correlated with the information on the transport radiation shield label.

(2) A licensee described by Items (iii) or (iv) of Subparagraph (b) of Paragraph (1) of this subsection:

(a) may prepare radioactive drugs for medical use, as defined in 20.3.7.7 NMAC, provided that the radioactive drug is prepared by either an authorized nuclear pharmacist, as specified in Subparagraphs (b) and (d) of this paragraph, or an individual under the supervision of an authorized nuclear pharmacist as specified in Subsection F of 20.3.7.702 NMAC;

(b) may allow a pharmacist to work as an authorized nuclear pharmacist if:

(i) the individual qualifies as an authorized nuclear pharmacist as defined in 20.3.7.7 NMAC;

(ii) the individual meets the requirements specified in Subsection C of 20.3.7.714 NMAC, incorporating 10 CFR 35.55(b) and Subsection E of 20.3.7.714 NMAC, incorporating 10 CFR 35.59, and the licensee has received an approved license amendment identifying this individual as an authorized nuclear pharmacist; or

(iii) the individual is designated as an authorized nuclear pharmacist in accordance with Subparagraph (d) of this paragraph;

(c) may conduct the actions authorized in Subparagraphs (a) and (b) of this paragraph in spite of more restrictive language in license conditions;

(d) may designate a pharmacist (as defined in 20.3.7.7 NMAC) as an authorized nuclear pharmacist if:

(i) the individual was a nuclear pharmacist preparing only radioactive drugs containing accelerator-produced radioactive material, and

(ii) the individual practiced at a pharmacy at a government agency or federally recognized Indian Tribe before November 30, 2007, or at all other pharmacies in non-licensing states, as defined in 20.3.1.7 NMAC, before August 8, 2009, or an earlier date as noticed by the NRC;

(e) may designate a pharmacist (as defined in 20.3.7.7 NMAC) as an authorized nuclear pharmacist if the individual is identified as of May 3, 1995, as an “authorized user” in a nuclear pharmacy license issued by the department under this part; and

(f) shall provide to the commission a copy of

(i) each individual’s certification by a specialty board whose certification process has been recognized by the Commission or agreement state as specified in 10 CFR 35.55(a); or

(ii) the Commission or agreement state license, or

(iii) Commission master material licensee permit, or

(iv) the permit issued by a licensee or Commission master materials permittee of broad scope, or the authorization from a commercial nuclear pharmacy authorized to list its own authorized nuclear pharmacist, or

(v) documentation that only accelerator-produced radioactive materials were used in the practice of nuclear pharmacy at a government agency or federally recognized Indian Tribe before November 30, 2007, or at all other pharmacies in non-licensing states, as defined in 20.3.1.7 NMAC, before August 8, 2009, or an earlier date as noticed by the NRC; and

(vi) the state pharmacy licensure or registration, no later than 30 days after the date that the licensee allows, under Items (i) and (iii) of Subparagraph (b) of this paragraph, the individual to work as an authorized nuclear pharmacist.

(3) A licensee shall possess and use instrumentation to measure the radioactivity of radioactive drugs. The licensee shall have procedures for use of the instrumentation. The licensee shall measure, by

1 direct measurement or by combination of measurements and calculations, the amount of radioactivity in dosages of
2 alpha, beta or photon emitting radioactive drugs prior to transfer for commercial distribution. In addition, the
3 licensee shall:

4 (a) perform tests before initial use, periodically and following repair, on each
5 instrument for accuracy, linearity and geometry dependence, as appropriate for the use of the instrument; and make
6 adjustments when necessary; and

7 (b) check each instrument for constancy and proper operation at the beginning of
8 each day of use.

9 (4) A licensee shall satisfy the labeling requirements in paragraph J(1)(d) of this section.

10 (5) Nothing in this section relieves the licensee from complying with applicable FDA, or
11 other federal and state requirements governing radioactive drugs.

12 **K. Manufacture and distribution of sources or devices containing radioactive material for**
13 **medical use.** An application for a specific license to manufacture and distribute sources and devices containing
14 radioactive material to persons licensed pursuant to 20.3.7 NMAC for use as a calibration, transmission or reference
15 source or for the uses listed in 20.3.7.710 NMAC, 20.3.7.711 NMAC and 20.3.7.712 NMAC will be approved if:

16 (1) the applicant satisfies the general requirements in 20.3.3.307 NMAC and 20.3.3.308
17 NMAC; and

18 (2) the applicant satisfies the requirements in 10 CFR 32.74.

19 **L. Requirements for license to manufacture and distribute industrial products containing**
20 **depleted uranium for mass-volume applications.**

21 (1) An application for a specific license to manufacture industrial products and devices
22 containing depleted uranium for use pursuant to Subsection E of 20.3.3.304 NMAC or equivalent regulations of the
23 NRC or an agreement state will be approved if:

24 (a) the applicant satisfies the general requirements specified in 20.3.3.307 NMAC
25 and 20.3.3.308 NMAC;

26 (b) the applicant submits sufficient information relating to the design, manufacture,
27 prototype testing, quality control procedures, labeling and marking, proposed uses, and potential hazards of the
28 industrial product or device to provide reasonable assurance that possession, use, or transfer of the depleted uranium
29 in the product or device is not likely to cause any individual to receive in one year a radiation dose in excess of ten
30 percent of the limits specified in Subsection A of 20.3.4.405 NMAC; and

31 (c) the applicant submits sufficient information regarding the industrial product or
32 device and the presence of depleted uranium for a mass-volume application in the product or device to provide
33 reasonable assurance that unique benefits will accrue to the public because of the usefulness of the product or
34 device.

35 (2) In the case of an industrial product or device whose unique benefits are questionable, the
36 department will approve an application for a specific license under this subsection only if the product or device is
37 found to combine a high degree of utility and low probability of uncontrolled disposal and dispersal of significant
38 quantities of depleted uranium into the environment.

39 (3) The department may deny application for a specific license under this subsection if the
40 end use of the industrial product or device cannot be reasonably foreseen.

41 (4) Each person licensed pursuant to this subsection shall:

42 (a) maintain the level of quality control required by the license in the manufacture
43 of the industrial product or device, and in the installation of the depleted uranium into the product or device;

44 (b) label or mark each unit to:

45 (i) identify the manufacturer or initial transferor of the product or device
46 and the number of the license under which the product or device was manufactured or initially transferred, the fact
47 that the product or device contains depleted uranium, and the quantity of depleted uranium in each product or
48 device; and

49 (ii) state that the receipt, possession, use and transfer of the product or
50 device are subject to a general license or the equivalent and the regulations of the NRC or of an agreement state;

51 (c) assure that the depleted uranium before being installed in each product or device
52 has been impressed with the following legend clearly legible through any plating or other covering: "*depleted*
53 *uranium*";

54 (d) furnish a copy of the general license contained in Subsection C of 20.3.3.304
55 NMAC and a copy of the department form to each person to whom they transfer depleted uranium in a product or
56 device for use pursuant to the general license contained in Subsection C of 20.3.3.304 NMAC; or furnish a copy of

1 the general license contained in the NRC or agreement state's regulation equivalent to Subsection C of 20.3.3.304
2 NMAC and a copy of the NRC or agreement state's certificate; or alternatively, furnish a copy of the general license
3 contained in Subsection C of 20.3.3.304 NMAC and a copy of department form to each person to whom they
4 transfer depleted uranium in a product or device for use pursuant to the general license of the NRC or an agreement
5 state, with a note explaining that use of the product or device is regulated by the NRC or an agreement state under
6 requirements substantially the same as those in Subsection C of 20.3.3.304 NMAC;

7 (e) report to the department all transfers of industrial products or devices to persons
8 for use under the general license in Subsection C of 20.3.3.304 NMAC; such report shall identify each general
9 licensee by name and address, an individual by name and (or) position who may constitute a point of contact
10 between the department and the general licensee, the type and model number of device transferred, and the quantity
11 of depleted uranium contained in the product or device; the report shall be submitted within 30 days after the end of
12 each calendar quarter in which such a product or device is transferred to the generally licensed person; if no transfers
13 have been made to persons generally licensed under Subsection C of 20.3.3.304 NMAC during the reporting period,
14 the report shall so indicate;

15 (f) report to the director of the office of nuclear material safety and safeguards, by
16 an appropriate method listed in 10 CFR 40.5 all transfers of industrial products or devices to persons for use under
17 the U.S. nuclear regulatory commission general license in 10 CFR 40.25; the report shall contain all information
18 described in Subparagraph (e) of this paragraph;

19 (g) report to the responsible state agency all transfers of devices manufactured and
20 distributed pursuant to Subsection L of 20.3.3.315 NMAC for use under a general license in that agreement state's
21 regulations equivalent to Subsection C of 20.3.3.304 NMAC; the report shall contain all information described in
22 Subparagraph (e) of this paragraph;

23 (h) keep records showing the name, address and point of contact for each general
24 licensee to whom they transfer depleted uranium in industrial products or devices for use pursuant to the general
25 license provided in Subsection C of 20.3.3.304 NMAC or equivalent regulations of the NRC or of an agreement
26 state; the records shall be retained for three years and show the date of each transfer, the quantity of depleted
27 uranium in each product or device transferred and compliance with the report requirements of this subsection.

28 **M. Licensing the manufacture, assembly, repair or distribution of commodities, products or**
29 **devices which contain radioactive material other than those enumerated above.** The department shall require
30 substantially the same information as required for licensing of similar items by 10 CFR Part 32 not specifically
31 named in this section.

32 **N. Serialization of nationally tracked sources.** Each licensee who manufactures a nationally
33 tracked source, as defined in 20.3.4.7 NMAC, after February 6, 2007 shall assign a unique serial number to each
34 nationally tracked source. Serial numbers must be composed only of alpha-numeric characters.

35 [20.3.3.315 NMAC - Rp, 20.3.3.315 NMAC, 04/30/2009; A, 02/14/2023; A, XX/XX/2026]
36

37 **20.3.3.316 ISSUANCE OF SPECIFIC LICENSES:**

38 **A.** Upon a determination that an application meets the requirements of the act and 20.3 NMAC, the
39 department will issue a specific license authorizing the proposed activity in such form and containing such
40 conditions and limitations as it deems appropriate or necessary to effectuate the purposes of the act.

41 **B.** The department may incorporate in any license at the time of issuance, or thereafter by license
42 amendment, rule, regulation, or order, such additional requirements and conditions with respect to the licensee's
43 receipt, possession, use and transfer of radioactive material subject to this part as it deems appropriate or necessary
44 in order to:

- 45 (1) minimize danger to public health and safety or property; or
46 (2) require reports and the keeping of records, or to provide for inspections of activities
47 under the license as may be appropriate or necessary; or
48 (3) prevent loss or theft of material subject to this chapter.

49 **C.** The department may request, and the licensee shall provide, additional information after the
50 license has been issued to enable the department to determine whether the license shall be modified in accordance
51 with 20.3.3.322 NMAC.

52 [20.3.3.316 NMAC - Rp, 20.3.3.316 NMAC, 4/30/2009]
53

54 **20.3.3.317 TERMS AND CONDITIONS OF LICENSES:**

55 **A.** Each license issued pursuant to the requirements in this part shall be subject to all the provisions
56 of the act, now or hereafter in effect, and to all rules, regulations and orders of the board or department.

1 (1) No right to the special nuclear material shall be conferred by the license except as defined
2 by the license;

3 (2) Neither the license nor any right under the license shall be assigned or otherwise
4 transferred in violation of the provisions of 20.3.3.317 NMAC;

5 (3) The license shall be subject to and the licensee shall observe, all applicable rules,
6 regulations, and orders of the department.

7 **B.** No license issued or granted under this part nor any right under a license issued pursuant to this
8 part shall be transferred, assigned, or in any manner disposed of, either voluntarily, or involuntarily, directly or
9 indirectly, through transfer of control of any license to any person unless the department shall, after securing full
10 information, find that the transfer is in accordance with the provisions of the act, and shall give its consent in
11 writing. An application for transfer of license must include:

12 (1) the identity, technical and financial qualifications of the proposed transferee; and

13 (2) financial assurance for decommissioning information required by 20.3.3.311 NMAC.

14 **C.** Each person licensed by the department pursuant to this part shall confine their use and possession
15 of material licensed to the locations and purposes authorized in the license. Except as otherwise provided in the
16 license, a license issued pursuant to the rules in this part shall carry with it the right to receive, acquire, own and
17 possess radioactive material. Preparation for shipment and transport of radioactive material shall be in accordance
18 with the provisions of 20.3.3.306 NMAC, incorporating 10 CFR 71.

19 **D.** Each license issued pursuant to the regulations in this part shall be deemed to contain the
20 applicable provisions set forth in the act and 20.3 NMAC, whether or not these provisions are expressly set forth in
21 the license.

22 **E. Filing for bankruptcy.**

23 (1) Each general licensee that is required to register by Paragraph (m) of Subsection B of
24 20.3.3.305 NMAC and each specific licensee shall notify the department and appropriate NRC Regional
25 Administrator in writing, immediately following the filing of a voluntary or involuntary petition for bankruptcy
26 under any chapter of title 11 (bankruptcy) of the United States Code by or against:

27 (a) the licensee;

28 (b) an entity (as that term is defined in 11 U.S.C. 101(15)) controlling the licensee
29 or listing the license or licensee as property of the estate; or

30 (c) an affiliate (as that term is defined in 11 U.S.C. 101(2)) of the licensee.

31 (2) The notification must indicate:

32 (a) the bankruptcy court in which the petition for bankruptcy was filed; and

33 (b) the date of the filing of the petition.

34 **F.** The general licenses provided in this part are subject to the provisions in 20.3.1 NMAC, Paragraph
35 (4) of Subsection A of 20.3.3.302 NMAC, Subsection A of 20.3.3.317 NMAC, 20.3.3.322 NMAC, 20.3.3.323
36 NMAC, 20.3.3.326 NMAC, 20.3.4 NMAC and 20.3.10 NMAC unless indicated otherwise by a particular provision
37 of the general license.

38 **G.** Licensees required submitting emergency plans by 20.3.3.309 NMAC shall follow the emergency
39 plan approved by the department. The licensee may change the approved plan without department approval only if
40 the changes do not decrease the effectiveness of the plan. The licensee shall furnish the change to the department
41 and to affected offsite response organizations prior to the effective date of the change. Proposed changes that
42 decrease, or potentially decrease, the effectiveness of the approved emergency plan may not be implemented without
43 prior application to and prior approval by the department.

44 **H. Security requirements for portable gauges.** Each portable gauge licensee shall use a minimum
45 of two independent physical controls that form tangible barriers to secure portable gauges from unauthorized
46 removal, whenever portable gauges are not under the control and constant surveillance of the licensee.

47 **I. Generators.** Each licensee preparing technetium-99m radiopharmaceuticals from molybdenum-
48 99/technetium-99m generators or rubidium-82 from strontium-82/rubidium-82 generators shall test the generator
49 eluates for molybdenum-99 breakthrough or strontium-82 and strontium-85 contamination, respectively, in
50 accordance with 20.3.7.706 NMAC of this chapter. The licensee shall record the results of each test and retain each
51 record for 3 years after the record is made. The licensee shall report the results of any test that exceeds the
52 permissible concentration listed in 10 CFR 35.204(a) at the time of generator elution, in accordance with 10 CFR
53 35.3204.

54 **J. PET drugs for non-commercial distribution.**

55 (1) Authorization under Subsection J of 20.3.3.307 NMAC to produce PET radioactive drugs
56 for non-commercial transfer to medical use licensees in its consortium does not relieve the licensee from complying

with applicable FDA, or other federal and state requirements governing radioactive drugs.

(2) Each licensee authorized under Subsection J of 20.3.3.307 NMAC to produce PET radioactive drugs for non-commercial transfer to medical use licensees in its consortium shall:

(a) satisfy the labeling requirements in Subparagraph (d) of Paragraph (1) of Subsection J of 20.3.3.315 NMAC for each PET radioactive drug transport radiation shield and each syringe, vial or other container used to hold a PET radioactive drug intended for non-commercial distribution to members of its consortium; and

(b) possess and use instrumentation to measure the radioactivity of the PET radioactive drugs intended for non-commercial distribution to members of its consortium and meet the procedural, radioactivity measurement, instrument test, instrument check and instrument adjustment requirements in Paragraph (3) of Subsection J of 20.3.3.315 NMAC.

(3) A licensee that is a pharmacy authorized under Subsection J of 20.3.3.307 NMAC to produce PET radioactive drugs for non-commercial transfer to medical use licensees in its consortium shall require that any individual that prepares PET radioactive drugs shall be:

(a) an authorized nuclear pharmacist that meets the requirements in Subparagraph (b) of Paragraph (2) of Subsection J of 20.3.3.315 NMAC; or

(b) an individual under the supervision of an authorized nuclear pharmacist as specified in Subsection F of 20.3.7.702 NMAC.

(4) A pharmacy, authorized under Subsection J of 20.3.3.307 NMAC to produce PET radioactive drugs for non-commercial transfer to medical use licensees in its consortium that allows an individual to work as an authorized nuclear pharmacist, shall meet the requirements of Subparagraph (e) of Paragraph (2) of Subsection J of 20.3.3.315 NMAC.

[20.3.3.317 NMAC - Rp, 20.3.3.317 NMAC, 4/30/2009; A, 6/30/2011; A, 6/13/2017; A, 02/14/2023]

20.3.3.318 EXPIRATION AND TERMINATION OF LICENSES AND DECOMMISSIONING OF SITES AND SEPARATE BUILDINGS OR OUTDOOR AREAS:

A. The term of a specific license is five years unless the department granted a different term. Except as provided in Subsection B of this section, each specific license expires at the end of the day on the expiration date stated in the license unless the licensee has filed an application for renewal under 20.3.3.319 NMAC not less than 30 days before the expiration date stated in the existing license. If an application for renewal has been filed at least 30 days before the expiration date stated in the existing license, the existing license expires at the end of the day on which the department makes a final determination to deny the renewal application or, if the determination states an expiration date, the expiration date stated in the determination.

B. If the licensee failed to pay outstanding annual fees to the department as required by 20.3.16 NMAC, the specific license expires at the end of the day on the expiration date stated in the license. The licensee shall follow the requirements in Subsection F through L of this section for termination of the specific license, or apply for a license pursuant to 20.3.3.307 NMAC after the outstanding annual fee(s) has been paid.

C. Each specific license revoked by the department expires at the end of the day on the date of the department's final determination to revoke the license, or on the expiration date stated in the determination, or as otherwise provided by department order.

D. Expiration of the specific license does not relieve the licensee from the requirements in 20.3 NMAC. All license provisions continue in effect, beyond the expiration date if necessary, with respect to possession of radioactive material until the department notifies the licensee in writing that the license is terminated. During this time, the licensee shall:

(1) limit actions involving radioactive material to those related to decommissioning; and

(2) continue to control entry to restricted areas until they are suitable for release in accordance with department requirements.

E. Within 60 days of the occurrence of any of the following, each licensee shall provide notification to the department in writing of such occurrence, and either begin decommissioning its site, or any separate building or outdoor area that contains residual radioactivity so that the building or outdoor area is suitable for release in accordance with department requirements, or submit within 12 months of notification a decommissioning plan, if required by Subsection H of this section, and begin decommissioning upon approval of that plan if:

(1) the license has expired or has been revoked pursuant to Subsections A, B or C of this section; or

(2) the licensee has decided to permanently cease principal activities, as defined in 20.3.3.7 NMAC, at the entire site or in any separate building or outdoor area that contains residual radioactivity such that the

1 building or outdoor area is unsuitable for release in accordance with department requirements; or
2 (3) no principal activities under the license have been conducted for a period of 24 months;
3 or

4 (4) no principal activities have been conducted for a period of 24 months in any separate
5 building or outdoor area that contains residual radioactivity such that the building or outdoor area is unsuitable for
6 release in accordance with department requirements.

7 **F.** Coincident with the notification required by Subsection E of this section, the licensee shall
8 maintain in effect all decommissioning financial assurances established by the licensee pursuant to 20.3.3.311
9 NMAC in conjunction with a license issuance or renewal or as required by this section. The amount of the financial
10 assurance must be increased, or may be decreased, as appropriate, to cover the detailed cost estimate for
11 decommissioning established pursuant to Subparagraph (e) of Paragraph (4) of Subsection H of this section.

12 **G.** The department may grant a request to extend the time periods established in Subsection E of this
13 section, if the department determines that this relief is not detrimental to the public health and safety and is
14 otherwise in the public interest. The request must be submitted no later than 30 days before notification pursuant to
15 Subsection E of this section. The schedule for decommissioning set forth in Subsection E of this section may not
16 commence until the department has made a determination on the request.

17 **H. Decommissioning Plan.**

18 (1) A decommissioning plan must be submitted if required by license condition or if the
19 procedures and activities necessary to carry out decommissioning of the site or separate building or outdoor area
20 have not been previously approved by the department and these procedures could increase potential health and
21 safety impacts to workers or to the public, such as in any of the following cases:

22 (a) procedures would involve techniques not applied routinely during cleanup or
23 maintenance operations;

24 (b) workers would be entering areas not normally occupied where surface
25 contamination and radiation levels are significantly higher than routinely encountered during operation;

26 (c) procedures could result in significantly greater airborne concentrations of
27 radioactive materials than are present during operation; or

28 (d) procedures could result in significantly greater releases of radioactive material to
29 the environment than those associated with operation.

30 (2) The department may approve an alternate schedule for submittal of a decommissioning
31 plan required pursuant to Subsection E of this section if the department determines that the alternative schedule is
32 necessary to the effective conduct of decommissioning operations and presents no undue risk from radiation to the
33 public health and safety and is otherwise in the public interest.

34 (3) Procedures, such as those listed in Paragraph (1) of this subsection, with potential health
35 and safety impacts may not be carried out prior to approval of the decommissioning plan.

36 (4) The proposed decommissioning plan for the site or separate building or outdoor area
37 must include:

38 (a) a description of the conditions of the site or separate building or outdoor area
39 sufficient to evaluate the acceptability of the plan;

40 (b) a description of planned decommissioning activities;

41 (c) a description of methods used to ensure protection of workers and the
42 environment against radiation hazards during decommissioning;

43 (d) a description of the planned final radiation survey;

44 (e) an updated detailed cost estimate for decommissioning, comparison of that
45 estimate with present funds set aside for decommissioning, and a plan for assuring the availability of adequate funds
46 for completion of decommissioning; and

47 (f) for decommissioning plans calling for completion of decommissioning later than
48 24 months after plan approval, the plan shall include a justification for the delay based on the criteria in Subsection J
49 of this section.

50 (5) The proposed decommissioning plan will be approved by the department if the
51 information therein demonstrates that the decommissioning will be completed as soon as practicable and that the
52 health and safety of workers and the public will be adequately protected.

53 **I. Deadline for Decommissioning.**

54 (1) Except as provided in Subsection J of this section, licensees shall complete
55 decommissioning of the site or separate building or outdoor area as soon as practicable but no later than 24 months
56 following the initiation of decommissioning.

(2) Except as provided in Subsection J of this section, when decommissioning involves the entire site, the licensee shall request license termination as soon as practicable but no later than 24 months following the initiation of decommissioning.

J. The department may approve a request for an alternative schedule for completion of decommissioning of the site or separate building or outdoor area, and license termination if appropriate, if the department determines that the alternative is warranted by consideration of the following:

(1) whether it is technically feasible to complete decommissioning within the allotted 24-month period;

(2) whether sufficient waste disposal capacity is available to allow completion of decommissioning within the allotted 24-month period;

(3) whether a significant volume reduction in wastes requiring disposal will be achieved by allowing short-lived radionuclides to decay;

(4) whether a significant reduction in radiation exposure to workers can be achieved by allowing short-lived radionuclides to decay; and

(5) other site-specific factors which the department may consider appropriate on a case-by-case basis, such as the regulatory requirements of other government agencies, lawsuits, ground-water treatment activities, monitored natural ground-water restoration, actions that could result in more environmental harm than deferred cleanup, and other factors beyond the control of the licensee.

K. As the final step in decommissioning, the licensee shall:

(1) certify the disposition of all licensed material, including accumulated wastes, by submitting a completed *certificate - disposition of radioactive material* form or equivalent information; and

(2) conduct a radiation survey of the premises where the licensed activities were carried out and submit a report of the results of this survey, unless the licensee demonstrates in some other manner that the premises are suitable for release in accordance with the criteria for decommissioning in 20.3.4.426 NMAC; the licensee shall, as appropriate:

(a) report levels of gamma radiation in units of millisievert (microrentgen) per hour at one meter from surfaces, and report levels of radioactivity, including alpha and beta, in units of megabecquerels (disintegrations per minute or microcuries) per 100 square centimeters, removable and fixed, for surfaces, megabecquerels (microcuries) per milliliter for water, and becquerels (picocuries) per gram for solids such as soils or concrete; and

(b) specify the survey instrument(s) used and certify that each instrument is properly calibrated and tested.

L. Specific licenses, including expired licenses, will be terminated by written notice to the licensee when the department determines that:

(1) radioactive material has been properly disposed;

(2) reasonable effort has been made to eliminate residual radioactive contamination, if present; and

(3) a radiation survey has been performed which demonstrates that the premises are suitable for release in accordance with the criteria for decommissioning in 20.3.4.426 NMAC; or other information submitted by the licensee is sufficient to demonstrate that the premises are suitable for release in accordance with the criteria for decommissioning in 20.3.4.426 NMAC; and

(4) records required by Subsections D and F of 20.3.3.326 NMAC, have been received by the department.

[20.3.3.318 NMAC - Rp, 20.3.3.318 NMAC, A, 02/14/2023]

20.3.3.319 RENEWAL OF LICENSES:

A. Applications for renewal of specific licenses shall be filed in accordance with 20.3.3.307 NMAC not less than 30 days before the expiration date stated in the existing license.

B. In any case in which a licensee, not less than 30 days prior to expiration of their existing license, has filed an application in proper form for renewal or for a new license authorizing the same activities, such existing license shall not expire until the application has been finally determined by the department.

C. An application for renewal of a license shall be approved if the department determines that the requirements of this part have been satisfied, and the licensee has paid any outstanding annual fee(s) pursuant to 20.3.16 NMAC.

[20.3.3.319 NMAC - Rp, 20.3.3.319 NMAC and 20.3.3.321 NMAC, 4/30/2009]

20.3.3.320 AMENDMENT OF LICENSES AT REQUEST OF LICENSEE:

A. An license amendment may be requested by filing a form prescribed by the department pursuant to 20.3.3.307 NMAC which shall specify the proposed amendment and the grounds for the amendment.

B. Supporting documentation (e.g. training records, certificates, procedures, etc.) shall be submitted with the amendment, or provided upon request by the department within 30 days from the date of the request or other time as may be specified in the request. Failure to provide the appropriate supporting documentation within the prescribed time frame will be grounds for denial of the amendment.

C. A request for a license amendment shall be approved if the department determines that the requirements of this part have been satisfied, and the licensee has paid any outstanding annual fee(s) pursuant to 20.3.16 NMAC.

[20.3.3.320 NMAC - Rp, 20.3.3.320 NMAC and 20.3.3.321 NMAC, 4/30/2009]

20.3.3.321 [RESERVED]

20.3.3.322 MODIFICATION, SUSPENSION AND REVOCATION OF LICENSES:

A. The terms and conditions of all licenses shall be subject to amendment or modification by the department by reason of amendments to the act, or by reason of rules, regulations and orders issued by the board or department.

B. Any license may be modified, suspended or revoked, in whole or in part by the department, for any material false statement in the application or any statement of fact required under provisions of the act; or because of conditions revealed by such 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; or for violation of, or failure to observe any of the terms and conditions of the act, conditions of the license, or of any rule, regulation, or order of the board or department; or the department determines that existing conditions constitute a substantial threat to the public health and safety or the environment.

C. Except in cases of willfulness or those in which the public health, interest or safety requires otherwise, no license shall be modified, suspended, or revoked unless, prior to the institution of proceedings therefore, facts or conduct which may warrant such actions shall have been called to the attention of the licensee in writing and the licensee shall have been accorded an opportunity to demonstrate or achieve compliance with all lawful requirements.

[20.3.3.322 NMAC - Rp, 20.3.3.322 NMAC, 4/30/2009]

20.3.3.323 TRANSFER OF MATERIAL:

A. No licensee shall transfer radioactive material except as authorized by this section.

B. Except as otherwise provided in their license and subject to the provisions of Sections C and D this section any licensee may transfer radioactive material:

(1) to the department after receiving prior approval from the department;
(2) to the agency in any agreement state which regulates radioactive material pursuant to an agreement under Section 274 of the Atomic Energy Act;
(3) to the United States department of energy;
(4) to any person exempt from the Radiation Protection Act to the extent permitted under such exemptions; or to any person in the NRC jurisdiction or an agreement state, subject to the jurisdiction of that state, who has been exempted from the licensing requirements and regulations of the NRC or the agreement state, to the extent permitted under such exemption;

(5) to any person authorized to receive such material under terms of a general license or a specific license or equivalent licensing document issued by the department, the NRC or an agreement state; or

(6) as otherwise authorized by the department in writing.

C. Before transferring radioactive material to a specific licensee of the department, the NRC or an agreement state, or to a general licensee who is required to register with the department, the NRC or an agreement state prior to receipt of the radioactive material, the licensee transferring the material shall verify that the transferee's license authorizes the receipt of the type, form and quantity of radioactive material to be transferred.

D. The following methods for the verification required by Subsection C of this section are acceptable:

(1) the transferor may have in their possession, and read, a current copy of the transferee's specific license or registration certificate;

(2) the transferor may have in their possession a written certification by the transferee that they are authorized by license or registration certificate to receive the type, form and quantity of radioactive material

1 to be transferred, specifying the license or registration certificate number, issuing agency and expiration date;
2 (3) for emergency shipments, the transferor may accept oral certification by the transferee
3 that they are authorized by license or registration certificate to receive the type, form and quantity of radioactive
4 material to be transferred, specifying registration certificate number, issuing agency and expiration date; provided
5 that the oral certification is confirmed in writing within 10 days;
6 (4) the transferor may obtain other sources of information compiled by a reporting service
7 from official records of the department, the NRC or an agreement state as to the identity of licensees and the scope
8 and expiration dates of licenses and registration; or
9 (5) when none of the methods of verification described in Paragraphs (1) to (4) of this
10 subsection are readily available or when a transferor desires to verify that information received by one of such
11 methods is correct or up-to-date, the transferor may obtain and record confirmation from the department, the NRC or
12 an agreement state that the transferee is licensed to receive the radioactive material.
13 [20.3.3.323 NMAC - Rp, 20.3.3.323 NMAC, 4/30/2009]
14

15 **20.3.3.324 RECIPROCAL RECOGNITION OF LICENSES:**

16 **A.** Provided that the requirements of this section have been met, any person who holds a specific
17 license from the NRC or an agreement state, and issued by the regulatory authority having jurisdiction where the
18 licensee maintains an office for directing the licensed activity and at which radiation safety records are normally
19 maintained, is hereby granted a general license to conduct the activities authorized in such licensing document
20 within the state of New Mexico for a period not in excess of 180 days in any calendar year provided that:

21 (1) the licensing document does not limit the activity authorized by such document to
22 specified installations or locations;

23 (2) the out-of-state licensee notifies the department in writing at least three business days
24 prior to engaging in such activity, filing a form, *reciprocity application - proposed activities*; such notification shall
25 indicate the location of work, period of work, and type, manufacturer name and model number of radioactive
26 material to be brought within the state, the client's name and address, and shall be accompanied by a copy of the
27 pertinent licensing document and application fee as determined by 20.3.16 NMAC charged once for each calendar
28 year; if, for a specific case, the three-day period would impose an undue hardship on the out-of-state licensee, they
29 may, upon application to the department, obtain permission to proceed sooner; the department may waive the
30 requirements for filing additional written notifications during the calendar year following the receipt of the initial
31 notification from a person engaging in activities under the general license provided in this section;

32 (3) the out-of-state licensee complies with all applicable provisions of 20.3 NMAC, all
33 provisions of the act, now or hereafter in effect, and orders of the board or department and with all the terms and
34 conditions of their licensing document, except any such terms and conditions which may be inconsistent with
35 requirements in this chapter;

36 (4) the out-of-state licensee supplies such other information as the department may request;
37 and

38 (5) the out-of-state licensee shall not transfer or dispose of radioactive material possessed or
39 used under the general license provided in this section except by transfer to a person specifically licensed by the
40 department, an agreement state or by the NRC to receive such material.

41 **B.** Notwithstanding the provisions of Subsection A of this section, any person who holds a specific
42 license issued by the NRC or an agreement state authorizing the holder to manufacture, transfer, install or service a
43 device described in Paragraph (1) of Subsection B of 20.3.3.305 NMAC within areas subject to the jurisdiction of
44 the licensing body is hereby granted a general license to install, transfer, demonstrate or service such a device in this
45 state provided that:

46 (1) such person shall file a report with the department within 30 days after the end of each
47 calendar quarter in which any device is transferred to or installed in this state; each such report shall identify each
48 general license to whom such device is transferred by name and address, the type of device transferred, and the
49 quantity and type of radioactive material contained in the device;

50 (2) the device has been manufactured, labeled, installed and serviced in accordance with
51 applicable provisions of the specific license issued to such person by the NRC or an agreement state;

52 (3) such person shall assure that any labels required to be affixed in the device under
53 regulations of the authority which licensed manufacture of the device bear a statement that "*removal of this label is*
54 *prohibited*"; and

55 (4) the holder of the specific license shall furnish to each general licensee to whom they
56 transfer such device or on whose premises they install such device a copy of the general license contained in

Subsection B of 20.3.3.305 NMAC.

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

D. Reciprocity in Areas of Exclusive Federal Jurisdiction:

(1) Before radioactive material can be used at temporary jobsites at any federal facility, the jurisdictional status of the jobsites shall be determined. If a temporary jobsite is under exclusive federal jurisdiction, the general license authorized under Subsection A of this section is subject to all the rules, regulations, orders and fees of the NRC.

(2) Authorizations for use of radioactive materials in areas of exclusive federal jurisdiction shall be obtained from the NRC by:

- (a) filing an NRC form 241 in accordance with 10 CFR 150.20(b); or
- (b) applying for a specific NRC license.

E. Reciprocity in Other States:

(1) Before radioactive material can be used at a temporary jobsite in another state, authorization shall be obtained from the state if it is an agreement state or from NRC for any non-agreement state, either by filing for reciprocity or applying for a specific license.

(2) The general license authorized under Subsection A of this section is subject to all the rules, regulations, orders and fees of the agreement state, or those of the NRC for any non-agreement state. [20.3.3.324 NMAC - Rp, 20.3.3.324 NMAC, 4/30/2009]

20.3.3.325 REPORTING REQUIREMENTS:

A. Immediate Report. Each licensee shall notify the department as soon as possible but not later than 4 hours after the discovery of an event that prevents immediate protective actions necessary to avoid exposures to radiation or radioactive materials that could exceed regulatory limits or releases of licensed material that could exceed regulatory limits (events may include fires, explosions, toxic gas releases, etc.).

B. Twenty-Four Hour Report. Each licensee shall notify the department within 24 hours after the discovery of any of the following events involving licensed material.

(1) An unplanned contamination event that:

- (a) requires access to the contaminated area, by workers or the public, to be restricted for more than 24 hours by imposing additional radiological controls or by prohibiting entry into the area;
- (b) involves a quantity of material greater than five times the lowest annual limit on intake specified in 20.3.4.461 NMAC for the material; and
- (c) has access to the area restricted for a reason other than to allow radioactive material with a half-life of less than 24 hours to decay prior to decontamination.

(2) An event in which equipment is disabled or fails to function as designed when:

- (a) the equipment is required by regulation or license condition to prevent releases exceeding regulatory limits, to prevent exposures to radiation and radioactive materials exceeding regulatory limits, or to mitigate the consequences of an accident;
- (b) the equipment is required to be available and operable when it is disabled or fails to function; and
- (c) no redundant equipment is available and operable to perform the required safety function.

(3) An event that requires unplanned medical treatment at a medical facility of an individual with spreadable radioactive contamination on the individual's clothing or body.

(4) An unplanned fire or explosion damaging any licensed material or any device, container or equipment containing licensed material when:

- (a) the quantity of material involved is greater than five times the lowest annual limit on intake specified in 20.3.4.461 NMAC for the material; and
- (b) the damage affects the integrity of the licensed material or its container.

C. Preparation and Submission of Reports. Reports made by licensees in response to the requirements of this section must be made as follows.

(1) Licensees shall make reports required by Subsections A and B of this section by telephone to the department. To the extent that the information is available at the time of notification, the information provided in these reports must include:

1 (a) the caller's name and call back telephone number;
 2 (b) a description of the event, including date and time;
 3 (c) the exact location of the event;
 4 (d) the radioactive material, quantities and chemical and physical form of the
 5 licensed material involved; and
 6 (e) any personnel radiation exposure data available;
 7 (2) **Written report.** Each licensee who makes a report required by Subsections A and B of
 8 this section shall submit a written follow-up report within 30 days of the initial report. Written reports prepared
 9 pursuant to other regulations may be submitted to fulfill this requirement if the reports contain all of the necessary
 10 information and the appropriate distribution is made. These written reports must be sent to the department at the
 11 address in 20.3.1.116 NMAC. The reports must include the following:
 12 (a) a description of the event, including the probable cause and the manufacturer
 13 and model number (if applicable) of any equipment that failed or malfunctioned;
 14 (b) the exact location of the event;
 15 (c) the radioactive material, quantities and chemical and physical form of the
 16 licensed material involved;
 17 (d) date and time of the event;
 18 (e) corrective actions taken or planned and the results of any evaluations or
 19 assessments; and
 20 (f) the extent of exposure of individuals to radiation or to radioactive materials
 21 without identification of individuals by name.
 22 [20.3.3.325 NMAC - Rp, 20.3.3.312 NMAC, 4/30/2009]
 23
 24 **20.3.3.326 RECORDS:** Each person who receives radioactive material pursuant to a license and the
 25 regulations in this part and parts 20.3.5 NMAC, 20.3.7 NMAC, 20.3.12 NMAC, 20.3.13 NMAC, 20.3.14 NMAC
 26 and 20.3.15 NMAC is subject to the requirements of this section.
 27 **A.** The licensee shall keep records showing the receipt, transfer and disposal of the radioactive
 28 material as follows.
 29 (1) The licensee shall retain each record of receipt of radioactive material as long as the
 30 material is possessed and for three years following transfer or disposal of the material.
 31 (2) The licensee who transferred the material shall retain each record of transfer for three
 32 years after each transfer unless a specific requirement in another part of the regulations in this chapter dictates
 33 otherwise.
 34 (3) The licensee who disposed of the material shall retain each record of disposal of
 35 radioactive material until the department terminates each license that authorizes disposal of the material.
 36 **B.** The licensee shall retain each record required by applicable parts of 20.3 NMAC or by license
 37 condition for the period specified by the applicable regulation or license condition. If a retention period is not
 38 otherwise specified by regulation or license condition, the record shall be retained until the department terminates
 39 each license that authorizes the activity that is subject to the recordkeeping requirement.
 40 **C. Records Format and Retention Period.**
 41 (1) Records which must be maintained pursuant to 20.3 NMAC may be the original or a
 42 reproduced copy or microform if such reproduced copy or microform is duly authenticated by authorized personnel
 43 and the microform is capable of producing a clear and legible copy after storage for the period specified by 20.3
 44 NMAC. The record may also be stored in electronic media with the capability for producing legible, accurate and
 45 complete records during the required retention period. Records such as letters, drawings, specifications, shall
 46 include all pertinent information such as stamps, initials and signatures. The licensee shall maintain adequate
 47 safeguards against tampering with and loss of records.
 48 (2) If there is a conflict between the retention period in 20.3 NMAC, license condition or
 49 other written department approval or authorization pertaining to the retention period for the same type of record, the
 50 retention period specified in 20.3 NMAC for such records shall apply unless the department, pursuant to Subsection
 51 A of 20.3.1.107 NMAC, has granted a specific exemption from the record retention requirements specified in 20.3
 52 NMAC.
 53 **D.** Prior to license termination, each licensee authorized to possess radioactive material with a half-
 54 life greater than 120 days, in an unsealed form, shall forward the following records to the department:
 55 (1) records of disposal of licensed material made under Sections 434 (including burials
 56 authorized before January 28, 1981), 435, 436 and 437 of 20.3.4 NMAC; and

(2) records required by Paragraph (4) of Subsection B of 20.3.4.442 NMAC.

E. If licensed activities are transferred or assigned in accordance with Subsection B of 20.3.3.317 NMAC, each licensee authorized to possess radioactive material, with a half-life greater than 120 days, in an unsealed form, shall transfer the following records to the new licensee and the new licensee will be responsible for maintaining these records until the license is terminated:

(1) records of disposal of licensed material made under Sections 434 (including burials authorized before January 28, 1981), 435, 436 and 437 of 20.3.4 NMAC;

(2) records required by Paragraph (4) of Subsection B of 20.3.4.442 NMAC; and

(3) the records required under Subsection G of 20.3.3.311 NMAC.

F. Prior to license termination, each licensee shall forward the records required by Subsection G of 20.3.3.311 NMAC to the department.

[20.3.3.326 NMAC - Rp, 20.3.3.300 NMAC, 4/30/2009]

20.3.3.327 [RESERVED]

20.3.3.328 [RESERVED]

20.3.3.329 SCHEDULE A - EXEMPT CONCENTRATIONS:

A. Table 329.1.

TABLE 329.1			
Element (Atomic Number)	Isotope	Column I Gas Concentration microcurie/milliliter ¹	Column II Liquid and Solid Concentration microcurie/milliliter ²
Antimony (51)	Sb-122 Sb-124 Sb-125		3x10 ⁻⁴ 2x10 ⁻⁴ 1x10 ⁻³
Argon (18)	Ar-37 Ar-41	1x10 ⁻³ 4x10 ⁻⁷	
Arsenic (33)	As-73 As-74 As-76 As-77		5x10 ⁻³ 5x10 ⁻⁴ 2x10 ⁻⁴ 8x10 ⁻⁴
Barium (56)	Ba-131 Ba-140		2x10 ⁻³ 3x10 ⁻⁴
Beryllium (4)	Be-7		2x10 ⁻²
Bismuth (83)	Bi-206		4x10 ⁻⁴
Bromine (35)	Br-82	4x10 ⁻⁷	3x10 ⁻³
Cadmium (48)	Cd-109 Cd-115m Cd-115		2x10 ⁻³ 3x10 ⁻⁴ 3x10 ⁻⁴
Calcium (20)	Ca-45 Ca-47		9x10 ⁻⁵ 5x10 ⁻⁴
Carbon (6)	C-14	1x10 ⁻⁶	8x10 ⁻³
Cerium (58)	Ce-141 Ce-143 Ce-144		9x10 ⁻⁴ 4x10 ⁻⁴ 1x10 ⁻⁴
Cesium (55)	Cs-131 Cs-134m Cs-134		2x10 ⁻² 6x10 ⁻² 9x10 ⁻⁵
Chlorine (17)	Cl-38	9x10 ⁻⁷	4x10 ⁻³
Chromium (24)	Cr-51		2x10 ⁻²
Cobalt (27)	Co-57 Co-58		5x10 ⁻³ 1x10 ⁻³

TABLE 329.1			
Element (Atomic Number)	Isotope	Column I Gas Concentration microcurie/milliliter ¹	Column II Liquid and Solid Concentration microcurie/milliliter ²
	Co-60		5x10 ⁻⁴
Copper (29)	Cu-64		3x10 ⁻³
Dysprosium (66)	Dy-165 Dy-166		4x10 ⁻³ 4x10 ⁻⁴
Erbium (68)	Er-169 Er-171		9x10 ⁻⁴ 1x10 ⁻³
Europium (63)	Eu-152 (T ½ = 9.2 h) Eu-155		6x10 ⁻⁴ 2x10 ⁻³
Fluorine (9)	F-18	2x10 ⁻⁶	8x10 ⁻³
Gadolinium (64)	Gd-153 Gd-159		2x10 ⁻³ 8x10 ⁻⁴
Gallium (31)	Ga-72		4x10 ⁻⁴
Germanium (32)	Ge-71		2x10 ⁻²
Gold (79)	Au-196 Au-198 Au-199		2x10 ⁻³ 5x10 ⁻⁴ 2x10 ⁻³
Hafnium (72)	Hf-181		7x10 ⁻⁴
Hydrogen (1)	H-3	5x10 ⁻⁶	3x10 ⁻²
Indium (49)	In-113m In-114m		1x10 ⁻² 2x10 ⁻⁴
Iodine (53)	I-126 I-131 I-132 I-133 I-134	3x10 ⁻⁹ 3x10 ⁻⁹ 8x10 ⁻⁸ 1x10 ⁻⁸ 2x10 ⁻⁷	2x10 ⁻⁵ 2x10 ⁻⁵ 6x10 ⁻⁴ 7x10 ⁻⁵ 1x10 ⁻³
Iridium (77)	Ir-190 Ir-192 Ir-194		2x10 ⁻³ 4x10 ⁻⁴ 3x10 ⁻⁴
Iron (26)	Fe-55 Fe-59		8x10 ⁻³ 6x10 ⁻⁴
Krypton (36)	Kr-85m Kr-85	1x10 ⁻⁶ 3x10 ⁻⁶	
Lanthanum (57)	La-140		2x10 ⁻⁴
Lead (82)	Pb-203		4x10 ⁻³
Lutetium (71)	Lu-177		1x10 ⁻³
Manganese (25)	Mn-52 Mn-54 Mn-56		3x10 ⁻⁴ 1x10 ⁻³ 1x10 ⁻³
Mercury (80)	Hg-197m Hg-197 Hg-203		2x10 ⁻³ 3x10 ⁻³ 2x10 ⁻⁴
Molybdenum (42)	Mo-99		2x10 ⁻³
Neodymium (60)	Nd-147 Nd-149		6x10 ⁻⁴ 3x10 ⁻³
Nickel (28)	Ni-65		1x10 ⁻³

TABLE 329.1			
Element (Atomic Number)	Isotope	Column I Gas Concentration microcurie/milliliter ¹	Column II Liquid and Solid Concentration microcurie/milliliter ²
Niobium (Columbium) (41)	Nb-95 Nb-97		1x10 ⁻³ 9x10 ⁻³
Osmium (76)	Os-185 Os-191m Os-191 Os-193		7x10 ⁻⁴ 3x10 ⁻² 2x10 ⁻³ 6x10 ⁻⁴
Palladium (46)	Pd-103 Pd-109		3x10 ⁻³ 9x10 ⁻⁴
Phosphorous (15)	P-32		2x10 ⁻⁴
Platinum (78)	Pt-191 Pt-193m Pt-197m Pt-197		1x10 ⁻³ 1x10 ⁻² 1x10 ⁻² 1x10 ⁻³
Potassium (19)	K-42		3x10 ⁻³
Praseodymium (59)	Pr-142 Pr-143		3x10 ⁻⁴ 5x10 ⁻⁴
Promethium (61)	Pm-147 Pm-149		2x10 ⁻³ 4x10 ⁻⁴
Rhenium (75)	Re-183 Re-186 Re-188		6x10 ⁻³ 9x10 ⁻⁴ 6x10 ⁻⁴
Rhodium (45)	Rh-103m Rh-105		1x10 ⁻¹ 1x10 ⁻³
Rubidium (37)	Rb-86		7x10 ⁻⁴
Ruthenium (44)	Ru-97 Ru-103 Ru-105 Ru-106		4x10 ⁻³ 8x10 ⁻⁴ 1x10 ⁻³ 1x10 ⁻⁴
Samarium (62)	Sm-153		8x10 ⁻⁴
Scandium (21)	Sc-46 Sc-47 Sc-48		4x10 ⁻⁴ 9x10 ⁻⁴ 3x10 ⁻⁴
Selenium (34)	Se-75		3x10 ⁻³
Silicon (14)	Si-31		9x10 ⁻³
Silver (47)	Ag-102 Ag-110m Ag-111		1x10 ⁻³ 3x10 ⁻⁴ 4x10 ⁻⁴
Sodium (11)	Na-24		2x10 ⁻³
Strontium (38)	Sr-85 Sr-89 Sr-91 Sr-92		1x10 ⁻³ 1x10 ⁻⁴ 7x10 ⁻⁴ 7x10 ⁻⁴
Sulfur (16)	S-35	9x10 ⁻⁸	6x10 ⁻⁴
Tantalum (73)	Ta-182		4x10 ⁻⁴
Technetium (43)	Tc-96m Tc-96		1x10 ⁻¹ 1x10 ⁻³
Tellurium (52)	Te-125m Te-127m		2x10 ⁻³ 6x10 ⁻⁴

TABLE 329.1			
Element (Atomic Number)	Isotope	Column I Gas Concentration microcurie/milliliter ¹	Column II Liquid and Solid Concentration microcurie/milliliter ²
	Te-127 Te-129m Te-131m Te-132		3x10 ⁻³ 3x10 ⁻⁴ 6x10 ⁻⁴ 3x10 ⁻⁴
Terbium (65)	Tb-160		4x10 ⁻⁴
Thallium (81)	Tl-200 Tl-201 Tl-202 Tl-204		4x10 ⁻³ 3x10 ⁻³ 1x10 ⁻³ 1x10 ⁻³
Thulium (69)	Tm-170 Tm-171		5x10 ⁻⁴ 5x10 ⁻³
Tin (50)	Sn-113 Sn-125		9x10 ⁻⁴ 2x10 ⁻⁴
Tungsten (Wolfram) (74)	W-181 W-187		4x10 ⁻³ 7x10 ⁻⁴
Vanadium (23)	V-48		3x10 ⁻⁴
Xenon (54)	Xe-131m Xe-133 Xe-135	4x10 ⁻⁶ 3x10 ⁻⁶ 1x10 ⁻⁶	
Ytterbium (70)	Yb-175		1x10 ⁻³
Yttrium (39)	Y-90 Y-91m Y-91 Y-92 Y-93		2x10 ⁻⁴ 3x10 ⁻² 3x10 ⁻⁴ 6x10 ⁻⁴ 3x10 ⁻⁴
Zinc (30)	Zn-65 Zn-69m Zn-69		1x10 ⁻³ 7x10 ⁻⁴ 2x10 ⁻²
Zirconium (40)	Zr-95 Zr-97		6x10 ⁻⁴ 2x10 ⁻⁴
Beta or gamma emitting radioactive material not listed above with half-life less than 3 years.		1x10 ⁻¹⁰	1x10 ⁻⁶

Table 329.1 notes:

¹ values are given in column I only for those materials normally used as gases;

² microcuries per gram for solids.

B. Notes.

(1) Many radioisotopes disintegrate into isotopes which are also radioactive. In expressing the concentrations in Subsection A the activity stated is that of the parent isotope and takes into account the daughters.

(2) For purposes of 20.3.3.302 NMAC where there is involved a combination of isotopes, the limit for the combination shall be derived as follows: determine for each isotope in the product the ratio between the concentration present in the product and the exempt concentration established in Subsection A of this section for the specific isotope when not in combination. The sum of such ratios may not exceed "1" (i.e., unity). Example: (concentration of isotope A in product) / (exempt concentration of isotope A) + (concentration of isotope B in product) / (exempt concentration of isotope B) < 1.

(3) The values in this table are presented in scientific notation. In this notation, a value of 3 x 10⁻⁴ represents a value of 3E-4 or 0.0003.

(4) To convert microcuries to SI units of kilobecquerels multiply the above values by 37.

For example: Zirconium-97 of 2×10^{-4} microcurie multiplied by 37 is equivalent to 0.0074 kilobecquerel or 7.4 becquerels.
[20.3.3.329 NMAC - Rp, 20.3.3.329 NMAC, 4/30/2009]

20.3.3.330 SCHEDULE B - EXEMPT QUANTITIES:

TABLE 330.1		
Radioactive Material	Acronym	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-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(9.2h)	(Eu-152)	100
Europium-152(13y)	(Eu-152)	1
Europium-154	(Eu-154)	1
Europium-155	(Eu-155)	10
Fluorine-18	(F-18)	1,000

TABLE 330.1		
Radioactive Material	Acronym	Microcuries
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
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

TABLE 330.1		
Radioactive Material	Acronym	Microcuries
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
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
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	(Si-31)	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

TABLE 330.1		
Radioactive Material	Acronym	Microcuries
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-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

Table 330.1 note: to convert microcuries to SI units of kilobecquerels multiply the above values by 37. For example: Zirconium-97 of 10 microcuries multiplied by 37 is equivalent to 370 kilobecquerels.
[20.3.3.330 NMAC - Rp, 20.3.3.330 NMAC, 4/30/2009]

20.3.3.331 [RESERVED]

[20.3.3.331 NMAC - Rp, 20.3.3.331 NMAC, 4/30/2009; Repealed, 6/30/2011]

20.3.3.332 SCHEDULE D - RADIOACTIVE MATERIAL QUANTITIES FOR BROAD SCOPE LICENSES:

A. Table 332.1

TABLE 332.1		
Radioactive Material	Column I curies	Column II curies
Antimony-122	1	0.01
Antimony-124	1	0.01
Antimony-125	1	0.01
Arsenic-73	10	0.1
Arsenic-74	1	0.01
Arsenic-76	1	0.01
Arsenic-77	10	0.1
Barium-131	10	0.1
Barium-140	1	0.01
Beryllium-7	10	0.1
Bismuth-210	0.1	0.001
Bromine-82	10	0.1
Cadmium-109	1	0.01
Cadmium-115m	1	0.01
Cadmium-115	10	0.1
Calcium-45	1	0.01
Calcium-47	10	0.1
Carbon-14	100	1.0
Cerium-141	10	0.1
Cerium-143	10	0.1
Cerium-144	0.1	0.001
Cesium-131	100	1.0
Cesium-134m	100	1.0
Cesium-134	0.1	0.001
Cesium-135	1	0.01
Cesium-136	10	0.1
Cesium-137	0.1	0.001
Chlorine-36	1	0.01
Chlorine-38	100	1.0
Chromium-51	100	1.0
Cobalt-57	10	0.1
Cobalt-58m	100	1.0
Cobalt-58	1	0.01
Cobalt-60	0.1	0.001
Copper-64	10	0.1
Dysprosium-165	100	1.0
Dysprosium-166	10	0.1
Erbium-169	10	0.1
Erbium-171	10	0.1
Europium-152 (9.2 h)	10	0.1
Europium-152 (13 y)	0.1	0.001
Europium-154	0.1	0.001
Europium-155	1	0.01
Fluorine-18	100	1.0
Gadolinium-153	1	0.01
Gadolinium-159	10	0.1
Gallium-72	10	0.1
Germanium-71	100	1.0

TABLE 332.1		
Radioactive Material	Column I curies	Column II curies
Gold-198	10	0.1
Gold-199	10	0.1
Hafnium-181	1	0.01
Holmium-166	10	0.1
Hydrogen-3	100	1.0
Indium-113m	100	1.0
Indium-114m	1	0.01
Indium-115m	100	1.0
Indium-115	1	0.01
Iodine-125	0.1	0.001
Iodine-126	0.1	0.001
Iodine-129	0.1	0.01
Iodine-131	0.1	0.001
Iodine-132	10	0.1
Iodine-133	1	0.01
Iodine-134	10	0.1
Iodine-135	1	0.01
Iridium-192	1	0.01
Iridium-194	10	0.1
Iron-55	10	0.1
Iron-59	1	0.01
Krypton-85	100	1.0
Krypton-87	10	0.1
Lanthanum-140	1	0.01
Lutetium-177	10	0.1
Manganese-52	1	0.01
Manganese-54	1	0.01
Manganese-56	10	0.1
Mercury-197m	10	0.1
Mercury-197	10	0.1
Mercury-203	1	0.01
Molybdenum-99	10	0.1
Neodymium-147	10	0.1
Neodymium-149	10	0.1
Nickel-59	10	0.1
Nickel-63	1	0.01
Nickel-65	10	0.1
Niobium-93	1	0.01
Niobium-95	1	0.01
Niobium-97	100	1.0
Osmium-185	1	0.01
Osmium-191m	100	1.0
Osmium-191	10	0.1
Osmium-193	10	0.1
Palladium-103	10	0.1
Palladium-109	10	0.1
Phosphorus-32	1	0.01
Platinum-191	10	0.1
Platinum-193m	100	1.0

TABLE 332.1		
Radioactive Material	Column I curies	Column II curies
Platinum-193	10	0.1
Platinum-197m	100	1.0
Platinum-197	10	0.1
Polonium-210	0.01	0.0001
Potassium-42	1	0.01
Praseodymium-142	10	0.1
Praseodymium-143	10	0.1
Promethium-147	1	0.01
Promethium-149	10	0.1
Radium-226	0.01	0.0001
Rhenium-186	10	0.1
Rhenium-188	10	0.1
Rhodium-103m	1,000	10.0
Rhodium-105	10	0.1
Rubidium-86	1	0.01
Rubidium-87	1	0.01
Ruthenium-97	100	1.0
Ruthenium-103	1	0.01
Ruthenium-105	10	0.1
Ruthenium-106	0.1	0.001
Samarium-151	1	0.01
Samarium-153	10	0.1
Scandium-46	1	0.01
Scandium-47	10	0.1
Scandium-48	1	0.01
Selenium-75	1	0.01
Silicon-31	10	0.1
Silver-105	1	0.01
Silver-110m	0.1	0.001
Silver-111	10	0.1
Sodium-22	0.1	0.001
Sodium-24	1	0.01
Strontium-85m	1,000	10.0
Strontium-85	1	0.01
Strontium-89	1	0.01
Strontium-90	0.01	0.0001
Strontium-91	10	0.1
Strontium-92	10	0.1
Sulphur-35	10	0.1
Tantalum-182	1	0.01
Technetium-96	10	0.1
Technetium-97m	10	0.1
Technetium-97	10	0.1
Technetium-99m	100	1.0
Technetium-99	1	0.01
Tellurium-125m	1	0.01
Tellurium-127m	1	0.01
Tellurium-127	10	0.1
Tellurium-129m	1	0.01

TABLE 332.1		
Radioactive Material	Column I curies	Column II curies
Tellurium-129	100	1.0
Tellurium-131m	10	0.1
Tellurium-132	1	0.01
Terbium-160	1	0.01
Thallium-200	10	0.1
Thallium-201	10	0.1
Thallium-202	10	0.1
Thallium-204	1	0.01
Thulium-170	1	0.01
Thulium-171	1	0.01
Tin-113	1	0.01
Tin-125	1	0.01
Tungsten-181	1	0.01
Tungsten-185	1	0.01
Tungsten-187	10	0.1
Vanadium-48	1	0.01
Xenon-131m	1,000	10.0
Xenon-133	100	1.0
Xenon-135	100	1.0
Ytterbium-175	10	0.1
Yttrium-90	1	0.01
Yttrium-91	1	0.01
Yttrium-92	10	0.1
Yttrium-93	1	0.01
Zinc-65	1	0.01
Zinc-69m	10	0.1
Zinc-69	100	1.0
Zirconium-93	1	0.01
Zirconium-95	1	0.01
Zirconium-97	1	0.01
Any radioactive material other than source material, special nuclear material, or alpha emitting radioactive material not listed above	0.1	0.001

B. Note. To convert curies to SI units of gigabecquerels, multiply the above values by 37. For example: Zirconium-97 (Column II) of 0.01 curie multiplied by 37 is equivalent to 0.37 gigabecquerel. [20.3.3.332 NMAC - Rp, 20.3.3.332 NMAC, 4/30/2009]

20.3.3.333 SCHEDULE E - QUANTITIES OF RADIOACTIVE MATERIALS REQUIRING CONSIDERATION OF THE NEED FOR AN EMERGENCY PLAN FOR RESPONDING TO A RELEASE:

A. Table 333.1

TABLE 333.1		
Radioactive Material	Release Fraction	Quantity (Curies)
Actinium-228	0.001	4,000
Americium-241	0.001	2
Americium-242	0.001	2
Americium-243	0.001	2
Antimony-124	0.01	4,000
Antimony-126	0.01	6,000

TABLE 333.1		
Radioactive Material	Release Fraction	Quantity (Curies)
Barium-133	0.01	10,000
Barium-140	0.01	30,000
Bismuth-207	0.01	5,000
Bismuth-210	0.01	600
Cadmium-109	0.01	1,000
Cadmium-113	0.01	80
Calcium-45	0.01	20,000
Californium-252	0.001	9 (20 mg)
Carbon-14 (Non CO ₂)	0.01	50,000
Cerium-141	0.01	10,000
Cerium-144	0.01	300
Cesium-134	0.01	2,000
Cesium-137	0.01	3,000
Chlorine-36	0.5	100
Chromium-51	0.01	300,000
Cobalt-60	0.001	5,000
Copper-64	0.01	200,000
Curium-242	0.001	60
Curium-243	0.001	3
Curium-244	0.001	4
Curium-245	0.001	2
Europium-152	0.01	500
Europium-154	0.01	400
Europium-155	0.01	3,000
Gadolinium-153	0.01	5,000
Germanium-68	0.01	2,000
Gold-198	0.01	30,000
Hafnium-172	0.01	400
Hafnium-181	0.01	7,000
Holmium-166m	0.01	100
Hydrogen-3	0.5	20,000
Iodine-125	0.5	10
Iodine-131	0.5	10
Indium-114m	0.01	1,000
Iridium-192	0.001	40,000
Iron-55	0.01	40,000
Iron-59	0.01	7,000
Krypton-85	1.0	6,000,000
Lead-210	0.01	8
Manganese-56	0.01	60,000
Mercury-203	0.01	10,000
Molybdenum-99	0.01	30,000
Neptunium-237	0.001	2
Nickel-63	0.01	20,000
Niobium-94	0.01	300
Phosphorus-32	0.5	100
Phosphorus-33	0.5	1,000
Polonium-210	0.01	10
Potassium-42	0.01	9,000

TABLE 333.1		
Radioactive Material	Release Fraction	Quantity (Curies)
Promethium-145	0.01	4,000
Promethium-147	0.01	4,000
Radium-226	0.001	100
Ruthenium-106	0.01	200
Samarium-151	0.01	4,000
Scandium-46	0.01	3,000
Selenium-75	0.01	10,000
Silver-110m	0.01	1,000
Sodium-22	0.01	9,000
Sodium-24	0.01	10,000
Strontium-89	0.01	3,000
Strontium-90	0.01	90
Sulfur-35	0.5	900
Technetium-99	0.01	10,000
Technetium-99m	0.01	400,000
Tellurium-127m	0.01	5,000
Tellurium-129m	0.01	5,000
Terbium-160	0.01	4,000
Thulium-170	0.01	4,000
Tin-113	0.01	10,000
Tin-123	0.01	3,000
Tin-126	0.01	1,000
Titanium-44	0.01	100
Vanadium-48	0.01	7,000
Xenon-133	1.0	900,000
Yttrium-91	0.01	2,000
Zinc-65	0.01	5,000
Zirconium-93	0.01	400
Zirconium-95	0.01	5,000
Any other beta-gamma emitter	.01	10,000
Mixed fission products	.01	1,000
Mixed corrosion products	.01	10,000
Contaminated equipment beta-gamma	.001	10,000
Irradiated material, any form other than solid, noncombustible	.01	1,000
Irradiated material solid, noncombustible	.001	10,000
Mixed radioactive waste, beta-gamma	.01	1,000
Packaged mixed waste, beta-gamma	.001	10,000
Any other alpha emitter	.001	2
Contaminated equipment alpha	.0001	20
Packaged waste, alpha ¹	.0001	20

Table 333.1 note:

¹ waste packaged in Type B containers does not require an emergency plan.

B. Notes.

(1) To convert curies to SI units of gigabecquerels, multiply the above values by 37.

Example: Zirconium-95 of 5000 curies multiplied by 37 is equivalent to 185,000 gigabecquerels or 185 terabecquerels.

(2) For combinations of radioactive materials, consideration of the need for an emergency plan is required if the sum of the ratios of the quantity of each radioactive material authorized to the quantity listed for that material in table 333.1 exceeds one.

2
3 **20.3.3.334 CRITERIA RELATING TO USE OF FINANCIAL TESTS AND PARENT COMPANY**
4 **GUARANTEES FOR PROVIDING REASONABLE ASSURANCE OF FUNDS FOR**
5 **DECOMMISSIONING:**

6 **A. Introduction.** An applicant or licensee may provide reasonable assurance of the availability of
7 funds for decommissioning based on obtaining a parent company guarantee that funds will be available for
8 decommissioning costs and on a demonstration that the parent company passes a financial test. This section
9 establishes criteria for passing the financial test and for obtaining the parent company guarantee.

10 **B. Financial Test.**

11 **(1)** To pass the financial test, the parent company must meet the criteria of either
12 Subparagraphs (a) or (b) of this paragraph.

13 **(a)** The parent company must have:

14 **(i)** two of the following three ratios: a ratio of total liabilities to net worth
15 less than 2.0; a ratio of the sum of net income plus depreciation, depletion and amortization to total liabilities greater
16 than 0.1; and a ratio of current assets to current liabilities greater than 1.5;

17 **(ii)** net working capital and tangible net worth each at least six times the
18 current decommissioning cost estimates (or prescribed amount if a certification is used);

19 **(iii)** tangible net worth of at least \$10 million; and

20 **(iv)** assets located in the United States amounting to at least 90 percent of
21 total assets or at least six times the current decommissioning cost estimates (or prescribed amount if a certification is
22 used);

23 **(b)** The parent company must have:

24 **(i)** a current rating for its most recent bond issuance of AAA, AA, A or
25 BBB as issued by Standard and Poor's or Aaa, Aa, A or Baa as issued by Moody's;

26 **(ii)** tangible net worth at least six times the current decommissioning cost
27 estimate (or prescribed amount if a certification is used);

28 **(iii)** tangible net worth of at least \$10 million; and

29 **(iv)** assets located in the United States amounting to at least 90 percent of
30 total assets or at least six times the current decommissioning cost estimates for the total of all facilities or parts
31 thereof (or prescribed amount if certification is used).

32 **(2)** The parent company's independent certified public accountant must have compared the
33 data used by the parent company in the financial test, which is derived from the independently audited, year end
34 financial statements for the latest fiscal year, with the amounts in such financial statement. In connection with that
35 procedure the licensee shall inform the department within 90 days of any matters coming to the auditor's attention
36 which cause the auditor to believe that the data specified in the financial test shall be adjusted and that the company
37 no longer passes the test.

38 **(3)** After the initial financial test, the parent company must repeat the passage of the test
39 within 90 days after the close of each succeeding fiscal year.

40 **(4)** If the parent company no longer meets the requirements of Subsection A of this section,
41 the licensee must send notice to the department of intent to establish alternate financial assurance as specified in this
42 section. The notice must be sent by certified mail within 90 days after the end of the fiscal year for which the year
43 end financial data show that the parent company no longer meets the financial test requirements. The licensee must
44 provide alternate financial assurance within 120 days after the end of such fiscal year.

45 **C. Parent Company Guarantee.** The terms of a parent company guarantee which an applicant or
46 licensee obtains must provide the following.

47 **(1)** The parent company guarantee will remain in force unless the guarantor sends notice of
48 cancellation by certified mail to the licensee and the department; cancellation may not occur, however, during the
49 120 days beginning on the date of receipt of the notice of cancellation by both the licensee and the department, as
50 evidenced by the return receipts.

51 **(2)** If the licensee fails to provide alternate financial assurance as specified in the
52 department's regulations within 90 days after receipt by the licensee and department of a notice of cancellation of
53 the parent company guarantee from the guarantor, the guarantor will provide such alternative financial assurance in
54 the name of the licensee.

55 **(3)** The parent company guarantee and financial test provisions must remain in effect until
56 the department has terminated the license.

(4) If a trust is established for decommissioning costs, the trustee and trust must be acceptable to the department; an acceptable trustee includes an appropriate state or federal government agency or an entity which has the authority to act as a trustee and whose trust operations are regulated and examined by a federal or state agency.
[20.3.3.334 NMAC - Rp, 20.3.3.334 NMAC, 4/30/2009]

20.3.3.335 CRITERIA RELATING TO USE OF FINANCIAL TESTS AND SELF-GUARANTEES FOR PROVIDING REASONABLE ASSURANCE OF FUNDS FOR DECOMMISSIONING:

A. Introduction. An applicant or licensee may provide reasonable assurance of the availability of funds for decommissioning based on furnishing its own guarantee that funds will be available for decommissioning costs and on a demonstration that the company passes the financial test of Subsection B of this section. The terms of the self-guarantee are in Subsection C of this section. This section establishes criteria for passing the financial test for the self guarantee and establishes the terms for a self-guarantee.

B. Financial Test.

(1) To pass the financial test, a company must meet all of the following criteria:
(a) tangible net worth at least 10 times the total current decommissioning cost estimate for the total of all facilities or parts thereof (or the current amount required if certification is used) for all decommissioning activities for which the company is responsible as self-guaranteeing licensee and as parent-guarantor;

(b) assets located in the United States amounting to at least 90 percent of total assets or at least 10 times the total current decommissioning cost estimate for the total of all facilities or parts thereof (or the current amount required if certification is used) for all decommissioning activities for which the company is responsible as self-guaranteeing licensee and as parent-guarantor; and

(c) a current rating for its most recent bond issuance of AAA, AA or A as issued by Standard and Poors, or Aaa, Aa or A as issued by Moodys.

(2) To pass the financial test, a company must meet all of the following additional requirements:

(a) the company must have at least one class of equity securities registered under the Securities Exchange Act;

(b) the company's independent certified public accountant must have compared the data used by the company in the financial test which is derived from the independently audited, year-end financial statements for the latest fiscal year, with the amounts in such financial statement; in connection with that procedure, the licensee shall inform the department within 90 days of any matters coming to the attention of the auditor that cause the auditor to believe that the data specified in the financial test shall be adjusted and that the company no longer passes the test; and

(c) after the initial financial test, the company must repeat passage of the test within 90 days after the close of each succeeding fiscal year.

(3) If the licensee no longer meets the requirements of Paragraph (1) of Subsection B of this section, the licensee must send immediate notice to the department of its intent to establish alternate financial assurance as specified in the department's regulations within 120 days of such notice.

C. Company Self-Guarantee. The terms of a self-guarantee which an applicant or licensee furnishes must provide the following.

(1) The guarantee will remain in force unless the licensee sends notice of cancellation by certified mail to the department; cancellation may not occur, however, during the 120 days beginning on the date of receipt of the notice of cancellation by the department, as evidenced by the return receipt.

(2) The licensee shall provide alternative financial assurance as specified in 20.3.3.311 NMAC within 90 days following receipt by the department of a notice of cancellation of the guarantee.

(3) The guarantee and financial test provisions must remain in effect until the department has terminated the license or until another financial assurance method acceptable to the department has been put in effect by the licensee.

(4) The licensee will promptly forward to the department and the licensee's independent auditor all reports covering the latest fiscal year filed by the licensee with the securities and exchange commission pursuant to the requirements of Section 13 of the Securities and Exchange Act.

(5) If, at any time, the licensee's most recent bond issuance ceases to be rated in any category of "A" or above by either Standard and Poors or Moodys, the licensee will provide notice in writing of such fact to the department within 20 days after publication of the change by the rating service. If the licensee's most recent

bond issuance ceases to be rated in any category of "A" or above by both Standard and Poors and Moodys, the licensee no longer meets the requirements of Paragraph (1) of Subsection B of this section.

(6) The applicant or licensee must provide to the department a written guarantee (a written commitment by a corporate officer) which states that the licensee will fund and carry out the required decommissioning activities or, upon issuance of an order by the department, the licensee will set up and fund a trust in the amount of the current cost estimates for decommissioning.
[20.3.3.335 NMAC - Rp, 20.3.3.335 NMAC, 4/30/2009]

20.3.3.336 CRITERIA RELATING TO USE OF FINANCIAL TESTS AND SELF-GUARANTEES FOR PROVIDING REASONABLE ASSURANCE OF FUNDS FOR DECOMMISSIONING BY COMMERCIAL COMPANIES THAT HAVE NO OUTSTANDING RATED BONDS:

A. Introduction. An applicant or licensee may provide reasonable assurance of the availability of funds for decommissioning based on furnishing its own guarantee that funds will be available for decommissioning costs and on a demonstration that the company passes the financial test of Subsection B of this section. The terms of the self-guarantee are in Subsection C of this section. This section establishes criteria for passing the financial test for the self guarantee and establishes the terms for a self-guarantee.

B. Financial Test.

(1) To pass the financial test, a company must meet the following criteria:

(a) tangible net worth greater than \$10 million, or at least 10 times the total current decommissioning cost estimate (or the current amount required if certification is used), whichever is greater, for all decommissioning activities for which the company is responsible as self-guaranteeing licensee and as parent-guarantor;

(b) assets located in the United States amounting to at least 90 percent of total assets or at least 10 times the total current decommissioning cost estimate (or the current amount required if certification is used) for all decommissioning activities for which the company is responsible as self-guaranteeing licensee and as parent-guarantor; and

(c) a ratio of cash flow divided by total liabilities greater than 0.12 and a ratio of total liabilities divided by net worth less than 1.5.

(2) In addition, to pass the financial test, a company must meet all of the following requirements:

(a) the company's independent certified public accountant must have compared the data used by the company in the financial test which is derived from the independently audited, year-end financial statements for the latest fiscal year, with the amounts in such financial statement; in connection with that procedure, the licensee shall inform the department within 90 days of any matters coming to the attention of the auditor that cause the auditor to believe that the data specified in the financial test shall be adjusted and that the company no longer passes the test;

(b) after the initial financial test, the company must repeat passage of the test within 90 days after the close of each succeeding fiscal year; and

(c) if the licensee no longer meets the requirements of Paragraph (1) of Subsection B of this section, the licensee must send immediate notice to the department of its intent to establish alternate financial assurance as specified in 20.3.3.311 NMAC; the notice must be sent by certified mail, return receipt requested, within 90 days after the end of the fiscal year for which the year end financial data show that the licensee no longer meets the financial test requirements; the licensee must provide alternative financial assurance within 120 days after the end of such fiscal year.

C. Company Self-Guarantee. The terms of a self-guarantee which an applicant or licensee furnishes must provide the following.

(1) The guarantee will remain in force unless the licensee sends notice of cancellation by certified mail to the department; cancellation may not occur until alternative financial assurance mechanism is in place.

(2) The licensee shall provide alternative financial assurance as specified in 20.3.3.311 NMAC within 90 days following receipt by the department of a notice of cancellation of the guarantee.

(3) The guarantee and financial test provisions must remain in effect until the department has terminated the license or until another financial assurance method acceptable to the department has been put in effect by the licensee.

(4) The applicant or licensee must provide to the department a written guarantee (a written commitment by a corporate officer) which states that the licensee will fund and carry out the required

decommissioning activities or, upon issuance of an order by the department, the licensee will set up and fund a trust in the amount of the current cost estimates for decommissioning.
[20.3.3.336 NMAC - N, 4/30/2009]

20.3.3.337 CRITERIA RELATING TO USE OF FINANCIAL TESTS AND SELF-GUARANTEE FOR PROVIDING REASONABLE ASSURANCE OF FUNDS FOR DECOMMISSIONING BY NONPROFIT COLLEGES, UNIVERSITIES AND HOSPITALS:

A. Introduction. An applicant or licensee may provide reasonable assurance of the availability of funds for decommissioning based on furnishing its own guarantee that funds will be available for decommissioning costs and on a demonstration that the applicant or licensee passes the financial test of Subsection B of this section. The terms of the self-guarantee are in Subsection C of this section. This section establishes criteria for passing the financial test for the self-guarantee and establishes the terms for a self-guarantee.

B. Financial Test.

(1) For colleges and universities, to pass the financial test a college or university must meet either the criteria in Subparagraph (a) or the criteria in Subparagraph (b) of this paragraph.

(a) For applicants or licensees that issue bonds, a current rating for its most recent uninsured, uncollateralized and unencumbered bond issuance of AAA, AA or A as issued by Standard and Poors or AAA, Aa or A as issued by Moodys.

(b) For applicants or licensees that do not issue bonds, unrestricted endowment consisting of assets located in the United States of at least \$50 million, or at least 30 times the total current decommissioning cost estimate (or the current amount required if certification is used), whichever is greater, for all decommissioning activities for which the college or university is responsible as a self-guaranteeing licensee.

(2) For hospitals, to pass the financial test a hospital must meet either the criteria in Subparagraph (a) or the criteria in Subparagraph (b) of this paragraph.

(a) For applicants or licensees that issue bonds, a current rating for its most recent uninsured, uncollateralized, and unencumbered bond issuance of AAA, AA or A as issued by Standard and Poors or AAA, Aa or A as issued by Moodys.

(b) For applicants or licensees that do not issue bonds, all the following tests must be met:

(i) total revenues less total expenditures divided by total revenues must be equal to or greater than 0.04;

(ii) long term debt divided by net fixed assets must be less than or equal to 0.67;

(iii) current assets and depreciation fund divided by current liabilities must be greater than or equal to 2.55; and

(iv) operating revenues must be at least 100 times the total current decommissioning cost estimate (or the current amount required if certification is used) for all decommissioning activities for which the hospital is responsible as a self-guaranteeing licensee.

(3) In addition, to pass the financial test, a licensee must meet all the following requirements:

(a) the licensee's independent certified public accountant must have compared the data used by the licensee in the financial test, which is required to be derived from the independently audited year end financial statements, based on United States generally accepted accounting practices, for the latest fiscal year, with the amounts in such financial statement; in connection with that procedure, the licensee shall inform the department within 90 days of any matters coming to the attention of the auditor that cause the auditor to believe that the data specified in the financial test shall be adjusted and that the licensee no longer passes the test;

(b) after the initial financial test, the licensee must repeat passage of the test within 90 days after the close of each succeeding fiscal year; and

(c) if the licensee no longer meets the requirements of Subsection B of this section, the licensee must send notice to the department of its intent to establish alternative financial assurance as specified in 20.3.3.311 NMAC; the notice must be sent by certified mail, return receipt requested, within 90 days after the end of the fiscal year for which the year end financial data show that the licensee no longer meets the financial test requirements; the licensee must provide alternate financial assurance within 120 days after the end of such fiscal year.

C. Self-Guarantee. The terms of a self-guarantee which an applicant or licensee furnishes must provide the following.

(1) The guarantee shall remain in force unless the licensee sends notice of cancellation by

certified mail and return receipt requested, to the department. Cancellation may not occur unless an alternative financial assurance mechanism is in place.

(2) The licensee shall provide alternative financial assurance as specified in the 20.3.3.311 NMAC within 90 days following receipt by the department of a notice of cancellation of the guarantee.

(3) The guarantee and financial test provisions must remain in effect until the department has terminated the license or until another financial assurance method acceptable to the department has been put in effect by the licensee.

(4) The applicant or licensee must provide to the department a written guarantee (a written commitment by a corporate officer or officer of the institution) which states that the licensee will fund and carry out the required decommissioning activities or, upon issuance of an order by the department, the licensee will set up and fund a trust in the amount of the current cost estimates for decommissioning.

(5) If, at any time, the licensee's most recent bond issuance ceases to be rated in any category of "A" or above by either Standard and Poors or Moodys, the licensee shall provide notice in writing of such fact to the department within 20 days after publication of the change by the rating service.
[20.3.3.337 NMAC - N, 4/30/2009]

20.3.3.338 QUANTITIES FOR USE WITH DECOMMISSIONING AND QUANTITIES OF LICENSED MATERIAL REQUIRING LABELING:

A. Table 338.1

TABLE 338.1	
Radioactive Material	Microcuries¹
Americium-241	0.01
Antimony-122	100
Antimony-124	10
Antimony-125	10
Arsenic-73	100
Arsenic-74	10
Arsenic-76	10
Arsenic-77	100
Barium-131	10
Barium-133	10
Barium-140	10
Bismuth-210	1
Bromine-82	10
Cadmium-109	10
Cadmium-115m	10
Cadmium-115	100
Calcium-45	10
Calcium-47	10
Carbon-14	100
Cerium-141	100
Cerium-143	100
Cerium-144	1
Cesium-131	1,000
Cesium-134m	100
Cesium-134	1
Cesium-135	10
Cesium-136	10
Cesium-137	10
Chlorine-36	10
Chlorine-38	10
Chromium-51	1,000
Cobalt-58m	10

TABLE 338.1	
Radioactive Material	Microcuries ¹
Cobalt-58	10
Cobalt-60	1
Copper-64	100
Dysprosium-165	10
Dysprosium-166	100
Erbium-169	100
Erbium-171	100
Europium-152 (9.2 h)	100
Europium-152 (13 yr)	1
Europium-154	1
Europium-155	10
Fluorine-18	1,000
Gadolinium-153	10
Gadolinium-159	100
Gallium-72	10
Germanium-71	100
Gold-198	100
Gold-199	100
Hafnium-181	10
Holmium-166	100
Hydrogen-3	1,000
Indium-113m	100
Indium-114m	10
Indium-115m	100
Indium-115	10
Iodine-125	1
Iodine-126	1
Iodine-129	0.1
Iodine-131	1
Iodine-132	10
Iodine-133	1
Iodine-134	10
Iodine-135	10
Iridium-192	10
Iridium-194	100
Iron-55	100
Iron-59	10
Krypton-85	100
Krypton-87	10
Lanthanum-140	10
Lutetium-177	100
Manganese-52	10
Manganese-54	10
Manganese-56	10
Mercury-197m	100
Mercury-197	100
Mercury-203	10
Molybdenum-99	100
Neodymium-147	100
Neodymium-149	100

TABLE 338.1	
Radioactive Material	Microcuries ¹
Nickel-59	100
Nickel-63	10
Nickel-65	100
Niobium-93m	10
Niobium-95	10
Niobium-97	10
Osmium-185	10
Osmium-191m	100
Osmium-191	100
Osmium-193	100
Palladium-103	100
Palladium-109	100
Phosphorus-32	10
Platinum-191	100
Platinum-193m	100
Platinum-193	100
Platinum-197m	100
Platinum-197	100
Plutonium-239	0.01
Polonium-210	0.1
Potassium-42	10
Praseodymium-142	100
Praseodymium-143	100
Promethium-147	10
Promethium-149	10
Radium-226	0.01
Rhenium-186	100
Rhenium-188	100
Rhodium-103m	100
Rhodium-105	100
Rubidium-86	10
Rubidium-87	10
Ruthenium-97	100
Ruthenium-103	10
Ruthenium-105	10
Ruthenium-106	1
Samarium-151	10
Samarium-153	100
Scandium-46	10
Scandium-47	100
Scandium-48	10
Selenium-75	10
Silicon-31	100
Silver-105	10
Silver-110m	1
Silver-111	100
Sodium-22	1
Sodium-24	10
Strontium-89	1
Strontium-90	0.1

TABLE 338.1	
Radioactive Material	Microcuries ¹
Strontium-91	10
Strontium-92	10
Sulfur-35	100
Tantalum-182	10
Technetium-96	10
Technetium-97m	100
Technetium-97	100
Technetium-99m	100
Technetium-99	10
Tellurium-125m	10
Tellurium-127m	10
Tellurium-127	100
Tellurium-129m	10
Tellurium-129	100
Tellurium-131m	10
Tellurium-132	10
Terbium-160	10
Thallium-200	100
Thallium-201	100
Thallium-202	100
Thallium-204	10
Thorium (natural) ²	100
Thulium-170	10
Thulium-171	10
Tin-113	10
Tin-125	10
Tungsten-181	10
Tungsten-185	10
Tungsten-187	100
Uranium (natural) ³	100
Uranium-233	0.01
Uranium-234	0.01
Uranium-235	0.01
Vanadium-48	10
Xenon-131m	1,000
Xenon-133	100
Xenon-135	100
Ytterbium-175	100
Yttrium-90	10
Yttrium-91	10
Yttrium-92	100
Yttrium-93	100
Zinc-65	10
Zinc-69m	100
Zinc-69	1,000
Zirconium-93	10
Zirconium-95	10
Zirconium-97	10
Any alpha emitting radionuclide not listed above or mixtures of alpha emitters of	0.01

TABLE 338.1	
Radioactive Material	Microcuries ¹
unknown composition	
Any radionuclide other than alpha emitting radionuclides, not listed above or mixtures of beta emitters of unknown composition	0.1

Table 338.1 notes:

¹ to convert microcurie to kilobecquerels, multiply the microcurie value by 37;

² based on alpha disintegration rate of Th-232, Th-230 and their daughter products;

³ based on alpha disintegration rate of U-238, U-234 and U-235.

B. Note. Where a combination of isotopes in known amounts is involved, the limit for the combination shall be derived as follows: determine, for each isotope in the combination, the ratio between the quantity present in the combination and the limit otherwise established for the specific isotope when not in combination. The sum of such ratios for all the isotopes in the combination may not exceed "1" (i.e. "unity"). [20.3.3.338 NMAC - Rp, 20.3.4.465 NMAC, 4/30/2009]

HISTORY OF 20.3.3 NMAC:

Pre-NMAC History: The material in this part was derived from that previously filed as follows:

EIB 73-2, Regulations for Governing the Health and Environmental Aspects of Radiation filed on 7/9/1973;

EIB 73-2, Amendment 1, Regulations for Governing the Health and Environmental Aspects of Radiation filed on 4/17/1978;

EIB RPR-1, Radiation Protection Regulations filed on 4/21/1980;

EIB RPR-1, Amendment 1, Radiation Protection Regulations filed on 10/13/1981;

EIB RPR-1, Amendment 2, Radiation Protection Regulations filed on 12/15/1982; and

EIB RPR-1, Radiation Protection Regulations filed on 3/10/1989.

History of Repealed Material:

20.3.3 NMAC, Licensing of Radioactive Material (filed 03/15/2004) repealed 4/30/2009.

Other History: EIB RPR 1, Radiation Protection Regulations (filed 3/10/1989) renumbered and reformatted to 20 NMAC 3.1; Radioactive Materials and Radiation Machines, effective 5/3/1995;

20 NMAC 3.1; Radioactive Materials and Radiation Machines (filed 4/3/1995) internally renumbered, reformatted and replaced by 20 NMAC 3.1, Radioactive Materials and Radiation Machines, effective 7/30/1999.

20 NMAC 3.1.Subpart 3, Licensing of Radioactive Material (filed 6/17/1999), reformatted, amended and replaced by 20.3.3 NMAC, Licensing of Radioactive Material, effective 4/15/2004.

20.3.3 NMAC, Licensing of Radioactive Material (filed 3/15/2004) replaced by 20.3.3 NMAC, Licensing of Radioactive Material, effective 4/30/2009.

TITLE 20 ENVIRONMENTAL PROTECTION
CHAPTER 3 RADIATION PROTECTION
PART 4 STANDARDS FOR PROTECTION AGAINST RADIATION

20.3.4.1 ISSUING AGENCY: Environmental Improvement Board.
[20.3.4.1 NMAC - Rp, 20.3.4.1 NMAC, 4/30/2009]

20.3.4.2 SCOPE: Except as specifically provided in other parts of this chapter, this part applies to persons licensed or registered by the department to receive, possess, use, transfer or dispose of sources of radiation. The limits in this part do not apply to doses due to background radiation, to exposure of patients to radiation for the purpose of medical diagnosis or therapy, to exposure from individuals administered radioactive material and released under Subsection I of 20.3.7.703 NMAC or to exposure from voluntary participation in medical research programs.
[20.3.4.2 NMAC - Rp, 20.3.4.1 NMAC, 4/30/2009]

20.3.4.3 STATUTORY AUTHORITY: Sections 74-1-8(A)(5), 74-1-9, 74-3-5 and 74-3-9 NMSA 1978.
[20.3.4.3 NMAC - Rp, 20.3.4.3 NMAC, 4/30/2009; A, XX/XX/2026]

20.3.4.4 DURATION: Permanent.
[20.3.4.4 NMAC - Rp, 20.3.4.4 NMAC, 4/30/2009]

20.3.4.5 EFFECTIVE DATE: ~~April 30, 2009~~ XX/XX/2026, unless a later date is cited at the end of a section.
[20.3.4.5 NMAC - Rp, 20.3.4.5 NMAC, 4/30/2009; A, XX/XX/2026]

20.3.4.6 OBJECTIVE:

- A.** The requirements of this part establish standards for protection against ionizing radiation resulting from activities conducted pursuant to licenses or registrations issued by the department.
- B.** The requirements of this part are designed to control the receipt, possession, use, transfer and disposal of sources of radiation by any licensee or registrant so the total dose to an individual, other than background radiation, does not exceed the standards for protection against radiation prescribed in this part. However, nothing in this part shall be construed as limiting actions that may be necessary to protect public health and safety.
[20.3.4.6 NMAC - Rp, 20.3.4.6 NMAC, 4/30/2009]

20.3.4.7 DEFINITIONS:

- A.** “**Absorbed dose**” means the energy imparted by ionizing radiation per unit mass of irradiated material. The units of absorbed dose are the gray (Gy) and the rad.
- B.** “**Activity**” means the rate of disintegration or transformation or decay of radioactive material. The units of activity are the becquerel (Bq) and the curie (Ci).
- C.** “**Adult**” means an individual 18 or more years of age.
- D.** “**Airborne radioactive material**” means any radioactive material dispersed in the air in the form of dusts, fumes, particulates, mists, vapors or gases.
- E.** “**Airborne radioactivity area**” means a room, enclosure or area in which airborne radioactive materials exist in concentrations:
- (1)** in excess of the derived air concentrations (DAC) specified in table I of 20.3.4.461 NMAC; or
- (2)** to such a degree that an individual in the area without respiratory protective equipment could exceed, during the hours an individual is present in a week, an intake of 0.6 percent of the annual limit on intake (ALI) or 12 DAC-hours.
- F.** “**Air-purifying respirator**” means a respirator with an air-purifying filter, cartridge or canister that removes specific air contaminants by passing ambient air through the air-purifying element.
- G.** “**ALARA**” (acronym for “as low as is reasonably achievable”) means making every reasonable effort to maintain exposures to radiation as far below the dose limits in these regulations as is practical, consistent with the purpose for which the licensed or registered activity is undertaken, taking into account the state of technology, the economics of improvements in relation to state of technology, the economics of improvements in

1 relation to benefits to the public health and safety and other societal and socioeconomic considerations, and in
2 relation to utilization of nuclear energy and licensed or registered sources of radiation in the public interest.

3 **H. “ALI”** (annual limit on intake) means the derived limit for the amount of radioactive material
4 taken into the body of an adult worker by inhalation or ingestion in a year. ALI is the smaller value of intake of a
5 given radionuclide in a year by the reference man that would result in a committed effective dose equivalent of 5
6 rems (0.05 sievert) or a committed dose equivalent of 50 rems (0.5 sievert) to any individual organ or tissue. ALI
7 values for intake by ingestion and by inhalation of selected radionuclides are given in columns 1 and 2 of table I of
8 20.3.4.461 NMAC.

9 **I. “APF”** (assigned protection factor) means the expected workplace level of respiratory protection
10 that would be provided by a properly functioning respirator or a class of respirators to properly fitted and trained
11 users. Operationally, the inhaled concentration can be estimated by dividing the ambient airborne concentration by
12 the APF.

13 **J. “Atmosphere-supplying respirator”** means a respirator that supplies the respirator user with
14 breathing air from a source independent of the ambient atmosphere, and includes supplied-air respirators (SARs)
15 and self-contained breathing apparatus (SCBA) units.

16 **K. “Background radiation”** means radiation from cosmic sources; naturally occurring radioactive
17 material as it occurs in nature, including radon (except as a decay product of source or special nuclear material); and
18 global fallout as it exists in the environment from the testing of nuclear explosive devices or from past nuclear
19 accidents such as Chernobyl that contribute to background radiation and are not under the control of the licensee.
20 *Background radiation* does not include radiation from radioactive material regulated by the department or NRC.

21 **L. “Bioassay”** (radiobioassay) means the determination of kinds, quantities or concentrations, and, in
22 some cases, the locations of radioactive material in the human body, whether by direct measurement (in vivo
23 counting) or by analysis and evaluation of materials excreted or removed from the human body.

24 **M. “Class”** (lung class or inhalation class) means a classification scheme for inhaled material
25 according to its rate of clearance from the pulmonary region of the lung. Materials are classified as D, W or Y,
26 which applies to a range of clearance half-times: for class D (days) of less than 10 days, for class W (weeks) from
27 10 to 100 days, and for class Y (years) of greater than 100 days.

28 **N. “Collective dose”** means the sum of the individual doses received in a given period of time by a
29 specified population from exposure to a specified source of radiation.

30 **O. “Committed dose equivalent”** ($H_{T,50}$) means the dose equivalent to organs or tissues of reference
31 (T) that will be received from an intake of radioactive material by an individual during the 50-year period following
32 the intake.

33 **P. “Committed effective dose equivalent”** ($H_{E,50}$) is the sum of the products of the weighting
34 factors applicable to each of the body organs or tissues that are irradiated and the committed dose equivalent to each
35 of these organs or tissues ($H_{E,50} = \{\text{sum over T}\} w_T H_{T,50}$).

36 **Q. “Constraint”** (dose constraint) means a value above which specified licensee actions are required.

37 **R. “Controlled area”** means an area, outside of a restricted area but inside the site boundary, access
38 to which can be limited by the licensee for any reason.

39 **S. “Critical Group”** means the group of individuals reasonably expected to receive the greatest
40 exposure to residual radioactivity for any applicable set of circumstances.

41 **T. “DAC”** means the derived air concentration.

42 **U. “DAC-hour”** means the derived air concentration - hour.

43 **V. “Declared pregnant woman”** means a woman who has voluntarily informed the licensee, in
44 writing, of pregnancy and the estimated date of conception. The declaration remains in effect until the declared
45 pregnant woman withdraws the declaration in writing or is no longer pregnant.

46 **W. “Deep dose equivalent”** (H_d), which applies to external whole body exposure, means the dose
47 equivalent at a tissue depth of 1 centimeter (1000 mg/cm²).

48 **X. “Demand respirator”** means an atmosphere-supplying respirator that admits breathing air to the
49 facepiece only when a negative pressure is created inside the facepiece by inhalation.

50 **Y. “Derived air concentration”** (DAC) means the concentration of a given radionuclide in air
51 which, if breathed by reference man for a working year of 2,000 hours under conditions of light work, results in an
52 intake of one ALI. For purposes of these regulations, the condition of light work is an inhalation rate of 1.2 cubic
53 meters of air per hour for 2,000 hours in a year. DAC values are given in column 3 of table I of 20.3.4.461 NMAC.

54 **Z. “Derived air concentration-hour”** (DAC-hour) means the product of the concentration of
55 radioactive material in air, expressed as a fraction or multiple of the derived air concentration for each radionuclide,

and the time of exposure to that radionuclide, in hours. A licensee or registrant may take 2,000 DAC-hours to represent one ALI, equivalent to a committed effective dose equivalent of 5 rems (0.05 sievert).

AA. “Disposable respirator” means a respirator for which maintenance is not intended and that is designed to be discarded after excessive breathing resistance, sorbent exhaustion, physical damage or end-of-service-life renders it unsuitable for use. Examples of this type of respirator are a disposable half-mask respirator or a disposable escape-only self-contained breathing apparatus (SCBA).

AB. “Distinguishable from background” means that the detectable concentration of a radionuclide is statistically different from the background concentration of that radionuclide in the vicinity of the site or, in the case of structures, in similar materials using adequate measurement technology, survey and statistical techniques.

AC. “Dose” (radiation dose) is a generic term that means absorbed dose, dose equivalent, effective dose equivalent, committed dose equivalent, committed effective dose equivalent, total organ dose equivalent or total effective dose equivalent.

AD. “Dose equivalent” (H_T) means the product of the absorbed dose in tissue, quality factor and all other necessary modifying factors at the location of interest. The units of dose equivalent are the sievert (Sv) and rem.

AE. “Dose limits” (limits) means the permissible upper bounds of radiation doses established in accordance with these regulations.

AF. “Dosimetry processor” means an individual or an organization that processes and evaluates individual monitoring devices in order to determine the radiation dose delivered to the monitoring devices.

AG. “Effective dose equivalent” (H_E) means the sum of the products of the dose equivalent to each organ or tissue (H_T), and the weighting factor (w_T) applicable to each of the body organs or tissues (T) that are irradiated ($H_E = \{\text{sum over } T\} w_T H_T$).

AH. “Embryo/fetus” means the developing human organism from conception until the time of birth.

AI. “Entrance or access point” means any opening through which an individual could gain access to radiation areas or to radioactive materials. This includes entry or exit portals of sufficient size to permit human entry, irrespective of their intended use.

AJ. “Exposure” means being exposed to ionizing radiation or to radioactive material. Exposure also means the quotient of dQ divided by dm where “ dQ ” is the absolute value of the total charge of the ions of one sign produced in air when all the electrons (negatrons and positrons) liberated by photons in a volume element of air having mass “ dm ” are completely stopped by air. The special unit of exposure is the roentgen (R). The SI unit of exposure is the coulomb per kilogram (C/kg) (see 20.3.4.8 NMAC).

AK. “Exposure rate” means the exposure per unit of time, such as roentgen per minute and milliroentgen per hour.

AL. “External dose” means that portion of the dose equivalent received from any source of radiation outside the body.

AM. “Extremity” means hand, elbow, arm below the elbow, foot, knee and leg below the knee.

AN. “Eye dose equivalent” means the external dose equivalent to the lens of the eye at a tissue depth of 0.3 centimeter (300 mg/cm²).

AO. “Filtering facepiece” (dust mask) means a negative pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium, not equipped with elastomeric sealing surfaces and adjustable straps.

AP. “Fit factor” means a quantitative estimate of the fit of a particular respirator to a specific individual and typically estimates the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when worn.

AQ. “Fit test” means the use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual.

AR. “Generally applicable environmental radiation standards” means standards issued by the EPA under the authority of the Atomic Energy Act that impose limits on radiation exposures or levels, and concentrations or quantities of radioactive material in the general environment outside the boundaries of locations under the control of persons possessing or using radioactive material.

AS. “Gray” (Gy) means the SI unit of absorbed dose. One gray is equal to an absorbed dose of 1 joule per kilogram (1 gray=100 rads).

AT. “Helmet” means a rigid respiratory inlet covering that also provides head protection against impact and penetration.

AU. “High radiation area” means an area, accessible to individuals, in which radiation levels from radiation sources external to the body could result in an individual receiving a dose equivalent in excess of 0.1 rem

(1 millisievert) in 1 hour at 30 centimeters from the radiation source or 30 centimeters from any surface that the radiation penetrates.

AV. "Hood" means a respiratory inlet covering that completely covers the head and neck and may also cover portions of the shoulders and torso.

AW. "Individual monitoring" means the assessment of:

(1) dose equivalent by the use of individual monitoring devices designed to be worn by an individual; or

(2) committed effective dose equivalent by bioassay or by determination of the time-weighted air concentrations to which an individual has been exposed, that is, DAC-hours; or

(3) dose equivalent by the use of survey data.

AX. "Individual monitoring devices" (individual monitoring equipment) means devices designed to be worn by a single individual for the assessment of dose equivalent, such as film badges, thermoluminescence dosimeters (TLDs), pocket ionization chambers and personal ("lapel") air sampling devices.

AY. "Inhalation class" (see "class").

AZ. "Internal dose" means that portion of the dose equivalent received from radioactive material taken into the body.

BA. "Lens dose equivalent" (LDE) applies to the external exposure of the lens of the eye and is taken as the dose equivalent at a tissue depth of 0.3 centimeter (300 mg/cm²).

BB. "Limits" (see "dose limits").

BC. "Loose-fitting facepiece" means a respiratory inlet covering that is designed to form a partial seal with the face.

BD. "Lung class" (see "class").

BE. "Member of the public" means any individual except when that individual is receiving an occupational dose.

BF. "Minor" means an individual less than 18 years of age.

BG. "Monitoring" (radiation monitoring, radiation protection monitoring) means the measurement of radiation, radioactive material concentrations, surface area activities or quantities or radioactive material and the use of the results of these measurements to evaluate potential exposures and doses.

BH. "Negative pressure respirator" (tight fitting) means a respirator in which the air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure outside the respirator.

BI. "Nationally tracked source" is a sealed source containing a quantity equal to or greater than category 1 or category 2 levels of any radioactive material listed in 20.3.4.467 NMAC. In this context a sealed source is defined as radioactive material that is sealed in a capsule or closely bonded, in a solid form and which is not exempt from regulatory control. It does not mean material encapsulated solely for disposal, or nuclear material contained in any fuel assembly, subassembly, fuel rod or fuel pellet. Category 1 nationally tracked sources are those containing radioactive material at a quantity equal to or greater than the category 1 threshold. Category 2 nationally tracked sources are those containing radioactive material at a quantity equal to or greater than the category 2 threshold but less than the category 1 threshold.

BJ. "Nonstochastic effect" (deterministic effect) means a health effect, the severity of which varies with the dose and for which a threshold is believed to exist. Radiation-induced cataract formation is an example of a nonstochastic effect.

BK. "Occupational dose" means the dose received by an individual in the course of employment in which the individual's assigned duties involve exposure to radiation or to radioactive material from licensed and unlicensed sources of radiation, whether in the possession of the licensee, registrant or other person. Occupational dose does not include dose received from background radiation; from any medical administration the individual has received; from exposure to individuals administered radioactive materials and released under Subsection I of 20.3.7.703 NMAC; from voluntary participation in medical research programs; or as a member of the public.

BL. "Personnel monitoring equipment" (see "individual monitoring devices").

BM. "Planned special exposure" means an infrequent exposure to radiation, separate from and in addition to the annual occupational dose limits.

BN. "Positive pressure respirator" means a respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air pressure outside the respirator.

BO. "Powered air-purifying respirator" (PAPR) means an air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.

BP. "Pressure demand respirator" means a positive pressure atmosphere-supplying respirator that admits breathing air to the facepiece when the positive pressure is reduced inside the facepiece by inhalation.

1 **BQ. “Public dose”** means the dose received by a member of the public from exposure to radiation or
2 radioactive material released by a licensee or registrant, or to any other sources of radiation under the control of a
3 licensee or registrant. Public dose does not include: occupational dose; dose received from background radiation;
4 dose received from any medical administration the individual has received; dose received from exposure to
5 individuals administered radioactive material and released under Subsection I of 20.3.7.703 NMAC; or dose
6 received from voluntary participation in medical research programs.

7 **BR. “Pyrophoric material”** means any liquid that ignites spontaneously in dry or moist air at or
8 below 130 degrees fahrenheit (54.4 degrees celsius) or any solid material, other than one classed as an explosive,
9 which under normal conditions is liable to cause fires through friction, retained heat from manufacturing or
10 processing, or which can be ignited readily and, when ignited, burns so vigorously and persistently as to create a
11 serious transportation, handling or disposal hazard. Included are spontaneously combustible and water-reactive
12 materials.

13 **BS. “Qualitative fit test” (QLFT)** means a pass or fail fit test to assess the adequacy of respirator fit
14 that relies on the individual's response to the test agent.

15 **BT. “Quality factor” (Q)** means the modifying factor, listed in table 8.1 of Subsection C of 20.3.4.8
16 NMAC and table 8.2 of Subsection D of 20.3.4.8 NMAC, that is used to derive dose equivalent from absorbed dose.

17 **BU. “Quantitative fit test” (QNFT)** means an assessment of the adequacy of respirator fit by
18 numerically measuring the amount of leakage into the respirator.

19 **BV. “Quarter”** means a period of time equal to one-fourth of the year observed by the licensee,
20 approximately 13 consecutive weeks, providing that the beginning of the first quarter in a year coincides with the
21 starting date of the year and that no day is omitted or duplicated in consecutive quarters.

22 **BW. “Radiation area”** means any area, accessible to individuals in which radiation levels could result
23 in an individual receiving a dose equivalent in excess of 0.005 rem (0.05 millisievert) in 1 hour at 30 centimeters
24 from the source of radiation or from any surface that the radiation penetrates.

25 **BX. “Radiation dose”** (see “dose”).

26 **BY. “Radiobioassay”** (see “bioassay”).

27 **BZ. “Reference man”** means a hypothetical aggregation of human physical and physiological
28 characteristics determined by international consensus. These characteristics may be used by researchers and public
29 health employees to standardize results of experiments and to relate biological insult to a common base. A
30 description of reference man is contained in the international commission on radiological protection report (ICRP),
31 publication 23, *report of the task group on reference man*.

32 **CA. “Residual radioactivity”** means radioactivity in structures, materials, soils, groundwater and
33 other media at a site resulting from activities under the licensee's control. This includes radioactivity from all
34 licensed and unlicensed sources used by the licensee, but excludes background radiation. It also includes
35 radioactive materials remaining at the site as a result of routine or accidental releases of radioactive material at the
36 site and previous burials at the site, even if those burials were made in accordance with the provisions of this part.

37 **CB. “Respiratory protective equipment”** means an apparatus, such as a respirator, used to reduce an
38 individual's intake of airborne radioactive materials.

39 **CC. “Restricted area”** means an area, access to which is limited by the licensee or registrant for
40 purposes of protection of individuals against undue risks from exposure to sources of radiation. Restricted area does
41 not include areas used as residential quarters, but separate rooms in a residential building may be set apart as a
42 restricted area.

43 **CD. “Sanitary sewerage”** means a system of public sewers for carrying off waste water and refuse,
44 but excluding sewage treatment facilities, septic tanks and leach fields owned or operated by the licensee or
45 registrant.

46 **CE. “Self-contained breathing apparatus” (SCBA)** means an atmosphere-supplying respirator for
47 which the breathing air source is designed to be carried by the user.

48 **CF. “Shallow-dose equivalent” (H_s)**, which applies to the external exposure of the skin of the whole
49 body or the skin of an extremity, is taken as the dose equivalent at a tissue depth of 0.007 centimeter (7 mg/cm²).

50 **CG. “SI”** means the international system of units.

51 **CH. “Site boundary”** means that line beyond which the land or property is not owned, leased or
52 otherwise controlled by the licensee or registrant.

53 **CI. “Stochastic effect”** (probabilistic effect) means a health effect that occurs randomly and for which
54 the probability of the effect occurring, rather than its severity, is assumed to be a linear function of dose without
55 threshold. Hereditary effects and cancer incidence are examples of stochastic effects.

CJ. “Supplied-air respirator” (SAR) or airline respirator means an atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user.

CK. “TEDE” (total effective dose equivalent) means the sum of the effective dose equivalent for external exposures and the committed effective dose equivalent for internal exposures.

CL. “Tight-fitting facepiece” means a respiratory inlet covering that forms a complete seal with the face.

CM. “TODE” (total organ dose equivalent) means the sum of the deep dose equivalent and the committed dose equivalent to the organ receiving the highest dose as described in Paragraph (6) of Subsection A of 20.3.4.446 NMAC.

CN. “Unrestricted area” means an area, access to which is neither limited nor controlled by the licensee or registrant.

CO. “User seal check” (fit check) means an action conducted by the respirator user to determine if the respirator is properly seated to the face. Examples include negative pressure check, positive pressure check, irritant smoke check or isoamyl acetate check.

CP. “Very high radiation area” means an area, accessible to individuals, in which radiation levels from radiation sources external to the body could result in an individual receiving an absorbed dose in excess of 500 rads (5 grays) in 1 hour at 1 meter from a radiation source or 1 meter from any surface that the radiation penetrates.

CQ. “Waste disposal site operators” means persons licensed to dispose of radioactive waste.

CR. “Waste handling licensees” means persons licensed to receive and store radioactive wastes prior to disposal or persons licensed to dispose of radioactive waste.

CS. “Week” means 7 consecutive days starting on Sunday.

CT. “Weighting factor” (w_T) for an organ or tissue (T) means the proportion of the risk of stochastic effects resulting from irradiation of that organ or tissue to the total risk of stochastic effects when the whole body is irradiated uniformly. For calculating the effective dose equivalent, the values of w_T are:

TABLE 7.1	
ORGAN DOSE WEIGHTING FACTORS	
Organ or Tissue	w_T
Gonads	0.25
Breast	0.15
Red bone marrow	0.12
Lung	0.12
Thyroid	0.03
Bone surfaces	0.03
Remainder	0.30 ¹
Whole Body	1.00 ²

table 7.1 notes:

¹ 0.30 results from 0.06 for each of 5 “remainder” organs, excluding the skin and the lens of the eye, that receive the highest doses.

² for the purpose of weighting the external whole body dose, for adding it to the internal dose, a single weighting factor, $w_T = 1.0$, has been specified. The use of other weighting factors for external exposure will be approved on a case-by-case basis until such time as specific guidance is issued.

CU. “Whole body” means, for purpose of external exposure, head, trunk including male gonads, arms above the elbow or legs above the knee.

CV. “Worker” means an individual engaged in work under a license or registration issued by the department and controlled by a licensee or registrant, but does not include the licensee or registrant.

CW. “Working level” (WL) means any combination of short-lived radon daughters in 1 liter of air that will result in the ultimate emission of $1.3E+5$ megaelectronvolts of potential alpha particle energy. The short-lived radon daughters are for radon-222: polonium-218, lead-214, bismuth-214 and polonium-214; and for radon-220: polonium-216, lead-212, bismuth-212 and polonium-212.

CX. “Working level month” (WLM) means exposure to 1 working level for 170 hours (2,000 working hours per year divided by 12 months per year is approximately equal to 170 hours per month).

CY. “Year” means the period of time beginning in January used to determine compliance with the provisions of these regulations. The licensee or registrant may change the starting date of the year used to determine compliance by the licensee or registrant provided that the change is made at the beginning of the year and that no day is omitted or duplicated in consecutive years.
[20.3.4.7 NMAC - Rp, 20.3.4.7 NMAC, 4/30/2009; A, 6/30/2011]

20.3.4.8 UNITS OF EXPOSURE AND DOSE:

A. As used in these regulations, the unit of exposure is the coulomb per kilogram (C/kg) of air. One roentgen is equal to 2.58E-4 coulomb per kilogram of air.

B. As used in these regulations, the units of dose are:

(1) gray (Gy) is the SI unit of absorbed dose; one gray is equal to an absorbed dose of 1 joule per kilogram (1 gray = 100 rads);

(2) rad is the special unit of absorbed dose; one rad is equal to an absorbed dose of 100 erg per gram or 0.01 joule per kilogram (1 rad = 0.01 gray);

(3) rem is the special unit of any of the quantities expressed as dose equivalent; the dose equivalent in rem is equal to the absorbed dose in rad multiplied by the quality factor (1 rem = 0.01 sievert); and

(4) sievert is the SI unit of any of the quantities expressed as dose equivalent; the dose equivalent in sievert is equal to the absorbed dose in gray multiplied by the quality factor (1 sievert = 100 rems).

C. As used in these regulations, the quality factors for converting absorbed dose to dose equivalent are shown in table 8.1.

TABLE 8.1 QUALITY FACTORS AND ABSORBED DOSE EQUIVALENCIES		
Type of Radiation	Quality Factor (Q)	Absorbed Dose Equal to A Unit Dose Equivalent ¹
X, gamma, or beta radiation and high-speed electrons	1	1
Alpha particles, multiple-charged particles, fission fragments and heavy particles of unknown charge	20	0.05
Neutrons of unknown energy	10	0.1
High-energy protons	10	0.1

Table 8.1 note: ¹absorbed dose in gray equal to 1 sievert or the absorbed dose in rad equal to 1 rem.

D. If it is more convenient to measure the neutron fluence rate than to determine the neutron dose equivalent rate in sievert per hour or rem per hour, as provided in Subsection C of this section, 0.01 sievert (1 rem) of neutron radiation of unknown energies may, for purposes of these regulations, be assumed to result from a total fluence of 25 million neutrons per square centimeter incident upon the body. If sufficient information exists to estimate the approximate energy distribution of the neutrons, the licensee or registrant may use the fluence rate per unit dose equivalent or the appropriate Q value from table 8.2 to convert a measured tissue dose in gray or rad to dose equivalent in sievert or rem (Note: The values in table 8.2 are presented in the “E” notation. In this notation a value of 5E-1 represents a value of 5x10⁻¹ or 0.5. A value of 4E+2 represents 4x10² or 400.)

TABLE 8.2 MEAN QUALITY FACTORS, Q, AND FLUENCE PER UNIT DOSE EQUIVALENT FOR MONOENERGETIC NEUTRONS			
Neutron Energy (megaelectronvolt)	Quality Factor ¹ (Q)	Fluence per Unit Dose Equivalent ² (neutrons centimeter ⁻² rem ⁻¹)	Fluence per Unit Dose Equivalent (neutrons centimeter ⁻² sievert ⁻¹)
(thermal) 2.5E-8	2	980E+6	980E+8
1E-7	2	980E+6	980E+8
1E-6	2	810E+6	810E+8
1E-5	2	810E+6	810E+8

TABLE 8.2 MEAN QUALITY FACTORS, Q, AND FLUENCE PER UNIT DOSE EQUIVALENT FOR MONOENERGETIC NEUTRONS			
Neutron Energy (megaelectronvolt)	Quality Factor ¹ (Q)	Fluence per Unit Dose Equivalent ² (neutrons centimeter ⁻² rem ⁻¹)	Fluence per Unit Dose Equivalent (neutrons centimeter ⁻² sievert ¹)
1E-4	2	840E+6	840E+8
1E-3	2	980E+6	980E+8
1E-2	2.5	1010E+6	1010E+8
1E-1	7.5	170E+6	170E+8
5E-1	11	39E+6	39E+8
1	11	27E+6	27E+8
2.5	9	29E+6	29E+8
5	8	23E+6	23E+8
7	7	24E+6	24E+8
10	6.5	24E+6	24E+8
14	7.5	17E+6	17E+8
20	8	16E+6	16E+8
40	7	14E+6	14E+8
60	5.5	16E+6	16E+8
1E+2	4	20E+6	20E+8
2E+2	3.5	19E+6	19E+8
3E+2	3.5	16E+6	16E+8
4E+2	3.5	14E+6	14E+8

Table 8.2 notes:

¹ value of quality factor (Q) at the point where the dose equivalent is maximum in a 30-centimeter diameter cylinder tissue-equivalent phantom;

² monoenergetic neutrons incident normally on a 30-centimeter diameter cylinder tissue-equivalent phantom.

[20.3.4.8 NMAC - Rp, 20.3.1.117 NMAC, 4/30/2009]

20.3.4.9 UNITS OF ACTIVITY: For purposes of these regulations, activity is expressed in the SI unit of becquerel (Bq) or in the special unit of curie (Ci), or their multiples, or disintegrations or transformations per unit of time.

A. One becquerel (Bq) = 1 disintegration or transformation per second (dps or tps).

B. One curie (Ci) = 3.7×10^{10} disintegration or transformation per second (dps or tps) = 3.7×10^{10} becquerel (Bq) = 2.22×10^{12} disintegration or transformation per minute (dpm or tpm).

[20.3.4.9 NMAC - Rp, 20.3.1.7 NMAC 4/30/2009]

20.3.4.10 through 20.3.4.402 [RESERVED]

20.3.4.403 IMPLEMENTATION:

A. Any existing license or registration condition or technical specification that is more restrictive than a requirement in this part remains in force until there is a technical specification change, license amendment or renewal, or registration amendment or renewal.

B. If a license or registration condition or technical specification exempted a licensee or registrant from a requirement in the standards for protection against radiation in effect prior to May 3, 1995 (see 20.3.4 NMAC codified as of May 3, 1995), it continues to exempt the licensee or registrant from the corresponding provision of this part.

C. If a license or registration condition cites provisions of this part in effect prior to the effective date of the regulations in this part, which do not correspond to any current provisions of this part, then the license or

1 registration condition remains in force until there is a technical specification change, an amendment or renewal of
2 the license or registration that modifies or removes that condition.
3 [20.3.4.403 NMAC - Rp, 20.3.4.403 NMAC, 4/30/2009]
4

5 **20.3.4.404 RADIATION PROTECTION PROGRAMS:**

6 **A.** Each licensee or registrant shall develop, document and implement a radiation protection program
7 commensurate with the scope and extent of licensed or registered activities and sufficient to ensure compliance with
8 the provisions of this part (see 20.3.4.441 NMAC for recordkeeping requirements related to these programs.)

9 **B.** The licensee or registrant shall use, to the extent practical, procedures and engineering controls
10 based upon sound radiation protection principles to achieve occupational doses and doses to members of the public
11 that are ALARA.

12 **C.** The licensee or registrant shall, at intervals not to exceed 12 months, review the radiation
13 protection program content and implementation with all employees before beginning their job duties and annually
14 thereafter.

15 **D.** To implement the ALARA requirements of Subsection B of this section, and notwithstanding the
16 requirements in 20.3.4.413 NMAC, a constraint on air emissions of radioactive material to the environment,
17 excluding Radon-222 and its daughters, shall be established by licensees such that the individual member of the
18 public likely to receive the highest dose will not be expected to receive a total effective dose equivalent in excess of
19 10 millirems (0.1 millisievert) per year from these emissions. If a licensee subject to this requirement exceeds this
20 dose constraint, the licensee shall report the exceedance as provided in 20.3.4.453 NMAC and promptly take
21 appropriate corrective action to ensure against recurrence.

22 [20.3.4.404 NMAC - Rp, 20.3.4.404 NMAC, 4/30/2009; A, 5/1/2024]
23

24 **20.3.4.405 OCCUPATIONAL DOSE LIMITS FOR ADULTS:**

25 **A. Annual limits.** The licensee or registrant shall control the occupational dose to individual adults,
26 except for planned special exposures pursuant to 20.3.4.410 NMAC, to the following dose limits:

- 27 (1) an annual limit, which is the more limiting of:
28 (a) the total effective dose equivalent being equal to 5 rems (0.05 sievert); or
29 (b) the sum of the deep dose equivalent and the committed dose equivalent to any
30 individual organ or tissue other than the lens of the eye being equal to 50 rems (0.5 sievert); and
31 (2) the annual limits to the lens of the eye, to the skin of the whole body, and to the skin of
32 extremities which are:
33 (a) a lens dose equivalent of 15 rems (0.15 sievert); and
34 (b) a shallow dose equivalent of 50 rems (0.5 sievert) to the skin of the whole body
35 or to the skin of any extremity.

36 **B.** Doses received in excess of the annual limits, including doses received during accidents,
37 emergencies and planned special exposures, shall be subtracted from the limits for planned special exposures that
38 the individual may receive during the current year and during the individual's lifetime (see Subsection E of
39 20.3.4.410 NMAC).

40 **C. Determining, assessing and assigning dose equivalent.**

41 (1) When the external exposure is determined by measurement with an external personal
42 monitoring device, the deep dose equivalent must be used in place of the effective dose equivalent, unless the
43 effective dose equivalent is determined by a dosimetry method approved by the department. The assigned shallow-
44 dose equivalent must be the dose averaged over the contiguous 10 square centimeters of skin receiving the highest
45 exposure. The deep-dose equivalent, lens dose equivalent and shallow-dose equivalent may be assessed from
46 surveys or other radiation measurements for the purpose of demonstrating compliance with the occupational dose
47 limits, if the individual monitoring device was not in the region of highest potential exposure, or the results of
48 individual monitoring are unavailable.

49 (2) **Working with fluoroscopic equipment.** When a protective apron is worn while
50 working with medical fluoroscopic equipment and monitoring is conducted as specified in Paragraph (5) of
51 Subsection A of 20.3.4.417 NMAC, the effective dose equivalent for external radiation shall be determined as
52 follows:

- 53 (a) when only one individual monitoring device is used and it is located at the neck
54 outside the protective apron, the reported deep dose equivalent shall be the effective dose equivalent for external
55 radiation; or

(b) when only one individual monitoring device is used and it is located at the neck outside the protective apron, and the reported dose exceeds 25 percent of the limit specified in Subsection A of this section, the reported deep dose equivalent value multiplied by 0.3 shall be the effective dose equivalent for external radiation; or

(c) when individual monitoring devices are worn, both under the protective apron at the waist and outside the protective apron at the neck, the effective dose equivalent for external radiation shall be assigned the value of the sum of the deep dose equivalent reported for the individual monitoring device located at the waist under the protective apron multiplied by 1.5 and the deep dose equivalent reported for the individual monitoring device located at the neck outside the protective apron multiplied by 0.04.

D. DAC and ALI. Derived air concentration (DAC) and annual limit on intake (ALI) values are specified in table I of 20.3.4.461 NMAC, and may be used to determine the individual's dose and to demonstrate compliance with the occupational dose limits.

E. Uranium limits. Notwithstanding the annual dose limits, the licensee shall limit the soluble uranium intake by an individual to 10 milligrams in a week in consideration of chemical toxicity (see table note 3 of 20.3.4.461 NMAC.)

F. Prior dose. The licensee or registrant shall reduce the dose that an individual may be allowed to receive in the current year by the amount of occupational dose received while employed by any other person during the current year (see 20.3.4.409 NMAC).

[20.3.4.405 NMAC - Rp, 20.3.4.405 NMAC, 4/30/2009; A, 6/30/2011]

20.3.4.406 COMPLIANCE WITH REQUIREMENTS FOR SUMMATION OF EXTERNAL AND INTERNAL DOSES:

A. If the licensee or registrant is required to monitor pursuant to both Subsections A and B of 20.3.4.417 NMAC, the licensee or registrant shall demonstrate compliance with the dose limits by summing external and internal doses. If the licensee or registrant is required to monitor only pursuant to either Subsection A or Subsection B of 20.3.4.417 NMAC, then summation is not required to demonstrate compliance with the dose limits. The licensee or registrant may demonstrate compliance with the requirements for summation of external and internal doses pursuant to Subsections B, C and D of this section. The dose equivalents for the lens of the eye, the skin and the extremities are not included in the summation, but are subject to separate limits.

B. Intake by Inhalation. If the only intake of radionuclides is by inhalation, the total effective dose equivalent limit is not exceeded if the sum of the deep dose equivalent divided by the total effective dose equivalent limit, and one of the following, does not exceed unity:

- (1) the sum of the fractions of the inhalation ALI for each radionuclide; or
- (2) the total number of derived air concentration-hours (DAC-hours) for all radionuclides divided by 2,000; or
- (3) the sum of the calculated committed effective dose equivalents to all significantly irradiated organs or tissues (T) calculated from bioassay data using appropriate biological models and expressed as a fraction of the annual limit; for purposes of this requirement, an organ or tissue is deemed to be significantly irradiated if, for that organ or tissue, the product of the weighting factors, w_T , and the committed dose equivalent, $H_{T,50}$, per unit intake is greater than 10 percent of the maximum weighted value of $H_{T,50}$, that is, $w_T H_{T,50}$, per unit intake for any organ or tissue.

C. Intake by Oral Ingestion. If the occupationally exposed individual receives an intake of radionuclides by oral ingestion greater than 10 percent of the applicable oral ALI, the licensee or registrant shall account for this intake and include it in demonstrating compliance with the limits.

D. Intake through Wounds or Absorption through Skin. The licensee or registrant shall evaluate and, to the extent practical, account for intakes through wounds or skin absorption. The intake through intact skin has been included in the calculation of DAC for hydrogen-3 and does not need to be evaluated or accounted for pursuant to Subsection D of 20.3.4.406 NMAC.

[20.3.4.406 NMAC - Rp, 20.3.4.406 NMAC, 4/30/2009]

20.3.4.407 DETERMINATION OF EXTERNAL DOSE FROM AIRBORNE RADIOACTIVE MATERIAL:

A. Licensees or registrants shall, when determining the dose from airborne radioactive material, include the contribution to the deep dose equivalent, lens dose equivalent and shallow dose equivalent from external exposure to the radioactive cloud (see 20.3.4.461 NMAC, table notes 1 and 2).

1 **B.** Airborne radioactivity measurements and DAC values shall not be used as the primary means to
2 assess the deep dose equivalent when the airborne radioactive material includes radionuclides other than noble gases
3 or if the cloud of airborne radioactive material is not relatively uniform. The determination of the deep dose
4 equivalent to an individual shall be based upon measurements using instruments or individual monitoring devices.
5 [20.3.4.407 NMAC - Rp, 20.3.4.407 NMAC, 4/30/2009]

6 **20.3.4.408 DETERMINATION OF INTERNAL EXPOSURE:**

7 **A.** For purposes of assessing dose used to determine compliance with occupational dose equivalent
8 limits, the licensee or registrant shall, when required pursuant to 20.3.4.417 NMAC, take suitable and timely
9 measurements of:

- 10 (1) concentrations of radioactive materials in air in work areas; or
- 11 (2) quantities of radionuclides in the body; or
- 12 (3) quantities of radionuclides excreted from the body; or
- 13 (4) combinations of these measurements.

14 **B.** Unless respiratory protective equipment is used, as provided in 20.3.4.423 NMAC, or the
15 assessment of intake is based on bioassays, the licensee or registrant shall assume that an individual inhales
16 radioactive material at the airborne concentration in which the individual is present.

17 **C.** When specific information on the physical and biochemical properties of the radionuclides taken
18 into the body or the behavior of the material in an individual is known, the licensee or registrant may:

- 19 (1) use that information to calculate the committed effective dose equivalent, and, if used, the
20 licensee or registrant shall document that information in the individual's record;
- 21 (2) upon prior approval of the department, adjust the DAC or ALI values to reflect the actual
22 physical and chemical characteristics of airborne radioactive material, for example, aerosol size distribution or
23 density; and
- 24 (3) separately assess the contribution of fractional intakes of class D, W or Y compounds of a
25 given radionuclide to the committed effective dose equivalent (see 20.3.4.461 NMAC).

26 **D.** If the licensee or registrant chooses to assess intakes of class Y material using the measurements
27 given in Paragraphs (2) or (3) of Subsection A of this section, the licensee or registrant may delay the recording and
28 reporting of the assessments for periods up to 7 months, unless otherwise required by 20.3.4.452 NMAC or
29 20.3.4.453 NMAC. This delay permits the licensee or registrant to make additional measurements basic to the
30 assessments.

31 **E.** If the identity and concentration of each radionuclide in a mixture are known, the fraction of the
32 DAC applicable to the mixture for use in calculating DAC-hours shall be either:

- 33 (1) the sum of the ratios of the concentration to the appropriate DAC value, that is, D, W or
34 Y, from 20.3.4.461 NMAC for each radionuclide in the mixture; or
- 35 (2) the ratio of the total concentration for all radionuclides in the mixture to the most
36 restrictive DAC value for any radionuclide in the mixture.

37 **F.** If the identity of each radionuclide in a mixture is known, but the concentration of one or more of
38 the radionuclides in the mixture is not known, the DAC for the mixture shall be the most restrictive DAC of any
39 radionuclide in the mixture.

40 **G.** When a mixture of radionuclides in air exists, a licensee or registrant may disregard certain
41 radionuclides in the mixture if:

- 42 (1) the licensee or registrant uses the total activity of the mixture in demonstrating
43 compliance with the dose limits in 20.3.4.405 NMAC and in complying with the monitoring requirements in
44 Subsection B of 20.3.4.417 NMAC; and
- 45 (2) the concentration of any radionuclide disregarded is less than 10 percent of its DAC; and
- 46 (3) the sum of these percentages for all of the radionuclides disregarded in the mixture does
47 not exceed 30 percent.

48 **H.** When determining the committed effective dose equivalent, the following information may be
49 considered:

- 50 (1) in order to calculate the committed effective dose equivalent, the licensee or registrant
51 may assume that the inhalation of one ALI, or an exposure of 2,000 DAC-hours, results in a committed effective
52 dose equivalent of 5 rems (0.05 sievert) for radionuclides that have their ALIs or DACs based on the committed
53 effective dose equivalent;
- 54 (2) for an ALI and the associated DAC determined by the nonstochastic organ dose limit of
55 50 rems (0.5 sievert), the intake of radionuclides that would result in a committed effective dose equivalent of 5
56 rems (0.05 sievert), that is, the stochastic ALI, is listed in parentheses in table I of 20.3.4.461 NMAC; the licensee or

registrant may, as a simplifying assumption, use the stochastic ALI to determine committed effective dose equivalent; however, if the licensee or registrant uses the stochastic ALI, the licensee or registrant shall also demonstrate that the limit in Paragraph (2) of Subsection A of 20.3.4.405 NMAC is met.
[20.3.4.408 NMAC - Rp, 20.3.4.408 NMAC, 4/30/2009]

20.3.4.409 DETERMINATION OF PRIOR OCCUPATIONAL DOSE:

A. For each individual who may enter the licensee's or registrant's restricted area and is likely to receive, in a year, an occupational dose requiring monitoring pursuant to 20.3.4.417 NMAC, the licensee or registrant shall determine the occupational radiation dose received during the current year.

B. Prior to permitting an individual to participate in a planned special exposure, the licensee or registrant shall determine:

- (1) the internal and external doses from all previous planned special exposures; and
- (2) all doses in excess of the limits, including doses received during accidents and emergencies, received during the lifetime of the individual.

C. In complying with the requirements of Subsections A or B of this section, a licensee or registrant may:

(1) accept, as a record of the occupational dose that the individual received during the current year, a written signed statement from the individual, or from the individual's most recent employer for work involving radiation exposure, that discloses the nature and the amount of any occupational dose that the individual received during the current year; and

(2) accept, as the record of lifetime cumulative radiation dose, a form *cumulative occupational dose history* or equivalent, signed by the individual and countersigned by an appropriate official of the most recent employer for work involving radiation exposure, or the individual's current employer, if the individual is not employed by the licensee or registrant; and

(3) obtain reports of the individual's dose equivalent from the most recent employer for work involving radiation exposure, or the individual's current employer, if the individual is not employed by the licensee or registrant, by telephone, telegram, facsimile or letter; the licensee or registrant shall request a written verification of the dose data if the authenticity of the transmitted report cannot be established.

D. Recording exposure history.

(1) The licensee or registrant shall record the exposure history of each individual, as required by Subsections A and B of this section, on department form *cumulative occupational dose history*, or other clear and legible record, including all the information required by that form. The form or record shall show each period in which the individual received occupational exposure to radiation or radioactive material and shall be signed by the individual who received the exposure. For each period for which the licensee or registrant obtains reports, the licensee or registrant shall use the dose shown in the report in preparing department form *cumulative occupational dose history* or equivalent. For any period in which the licensee or registrant does not obtain a report, the licensee or registrant shall place a notation on department form *cumulative occupational dose history* or equivalent indicating the periods of time for which data are not available.

(2) Licensees or registrants are not required to partition historical dose between external dose equivalent(s) and internal committed dose equivalent(s). Further, occupational exposure histories obtained and recorded on department form *cumulative occupational dose history* or equivalent before the effective date of these regulations, might not have included effective dose equivalent, but may be used in the absence of specific information on the intake of radionuclides by the individual.

E. If the licensee or registrant is unable to obtain a complete record of an individual's current and previously accumulated occupational dose, the licensee or registrant shall assume:

(1) in establishing administrative controls pursuant to Subsection F of 20.3.4.405 NMAC for the current year, that the allowable dose limit for the individual is reduced by 1.25 rems (12.5 millisieverts) for each quarter for which records were unavailable and the individual was engaged in activities that could have resulted in occupational radiation exposure; and

(2) that the individual is not available for planned special exposures.

F. The licensee or registrant shall retain the records on department form *cumulative occupational dose history* or equivalent until the department terminates each pertinent license or registration requiring this record. The licensee or registrant shall retain records used in preparing department form *cumulative occupational dose history* or equivalent for 3 years after the record is made.

[20.3.4.409 NMAC - Rp, 20.3.4.409 NMAC, 4/30/2009; A, 6/30/2011]

20.3.4.410 PLANNED SPECIAL EXPOSURES: A licensee or registrant may authorize an adult worker to receive doses in addition to and accounted for separately from the doses received under the limits specified in 20.3.4.405 NMAC provided that each of the following conditions is satisfied:

A. the licensee or registrant authorizes a planned special exposure only in an exceptional situation when alternatives that might avoid the dose estimated to result from the planned special exposure are unavailable or impractical;

B. the licensee or registrant, and employer if the employer is not the licensee or registrant, specifically authorizes the planned special exposure, in writing, before the exposure occurs;

C. before a planned special exposure, the licensee or registrant ensures that each individual involved is:

- (1) informed of the purpose of the planned operation;
- (2) informed of the estimated doses and associated potential risks and specific radiation levels or other conditions that might be involved in performing the task; and
- (3) instructed in the measures to be taken to keep the dose ALARA considering other risks that may be present;

D. prior to permitting an individual to participate in a planned special exposure, the licensee or registrant ascertains prior doses as required by Subsection B of 20.3.4.409 NMAC during the lifetime of the individual for each individual involved;

E. subject to Subsection B of 20.3.4.405 NMAC, the licensee or registrant shall not authorize a planned special exposure that would cause an individual to receive a dose from all planned special exposures and all doses in excess of the limits to exceed:

(1) the numerical values of any of the dose limits in Subsection A of 20.3.4.405 NMAC in any year; and

(2) five times the annual dose limits in Subsection A of 20.3.4.405 NMAC during the individual's lifetime;

F. the licensee or registrant maintains records of the conduct of a planned special exposure in accordance with 20.3.4.445 NMAC and submits a written report in accordance with 20.3.4.454 NMAC;

G. the licensee or registrant records the best estimate of the dose resulting from the planned special exposure in the individual's record and informs the individual, in writing, of the dose within 30 days from the date of the planned special exposure; the dose from planned special exposures shall not be considered in controlling future occupational dose of the individual pursuant to Subsection A of 20.3.4.405 NMAC but shall be included in evaluations required by Subsections D and E of this section.

[20.3.4.410 NMAC - Rp, 20.3.4.410 NMAC, 4/30/2009]

20.3.4.411 OCCUPATIONAL DOSE LIMITS FOR MINORS: The annual occupational dose limits for minors are 10 percent of the annual occupational dose limits specified for adult workers in 20.3.4.405 NMAC.

[20.3.4.411 NMAC - Rp, 20.3.4.411 NMAC, 4/30/2009]

20.3.4.412 DOSE EQUIVALENT TO AN EMBRYO/FETUS:

A. The licensee or registrant shall ensure that the dose equivalent to the embryo/fetus during the entire pregnancy, due to the occupational exposure of a declared pregnant woman, does not exceed 0.5 rem (5 millisieverts) (see 20.3.4.446 NMAC for recordkeeping requirements).

B. The licensee or registrant shall make efforts to avoid substantial variation above a uniform monthly exposure rate to a declared pregnant woman so as to satisfy the limit in Subsection A of this section.

C. The dose equivalent to the embryo/fetus is the sum of:

(1) the dose equivalent to the embryo/fetus resulting from radionuclides in the embryo/fetus and radionuclides in the declared pregnant woman; and

(2) the deep dose equivalent that is most representative of the dose to the embryo/fetus from external radiation, that is, in the mother's lower torso region:

(a) if multiple measurements have not been made, assignment of the highest deep dose equivalent for the declared pregnant woman shall be the dose to the embryo/fetus, in accordance with Subsection C of 20.3.4.405 NMAC; or

(b) if multiple measurements have been made, assignment of the deep dose equivalent for the declared pregnant woman from the individual monitoring device which is most representative of the dose to the embryo/fetus shall be the dose to the embryo/fetus; assignment of the highest deep dose equivalent

for the declared pregnant woman to the embryo/fetus is not required unless that dose is also the most representative deep dose equivalent for the region of the embryo/fetus.

D. If the dose equivalent to the embryo/fetus is found to have exceeded 0.5 rem (5 millisieverts), or is within 0.05 rem (0.5 millisievert) of this dose, by the time the woman declares the pregnancy to the licensee or registrant, the licensee or registrant shall be deemed to be in compliance with Subsection A of this section if the additional dose equivalent to the embryo/fetus does not exceed 0.05 rem (0.5 millisievert) during the remainder of the pregnancy.

[20.3.4.412 NMAC - Rp, 20.3.4.412 NMAC, 4/30/2009]

20.3.4.413 DOSE LIMITS FOR INDIVIDUAL MEMBERS OF THE PUBLIC:

A. Each licensee or registrant shall conduct operations so that:

(1) the total effective dose equivalent to individual members of the public from the licensed or registered operation does not exceed 0.1 rem (1 millisievert) in a year, exclusive of the dose contributions from background radiation, from any medical administration the individual has received, from exposure to individuals administered radioactive material and released under Subsection I of 20.3.7.703 NMAC, from voluntary participation in medical research programs, and from the licensee's disposal of radioactive material into sanitary sewerage in accordance with 20.3.4.435 NMAC; and

(2) the dose in any unrestricted area from external sources, exclusive of dose contributions from patients administered radioactive material and released under Subsection I of 20.3.7.703 NMAC, does not exceed 0.002 rem (0.02 millisievert) in any one hour.

B. If the licensee or registrant permits members of the public to have access to controlled areas, the limits for members of the public continue to apply to those individuals.

C. A licensee, registrant, or an applicant for a license or registration may apply for prior department authorization to operate up to an annual dose limit for an individual member of the public of 0.5 rem (5 millisieverts). This application shall include the following information:

(1) demonstration of the need for and the expected duration of operations in excess of the limit in Subsection A of this section;

(2) the licensee's or registrant's program to assess and control dose within the 0.5 rem (5 millisieverts) annual limit;

(3) the procedures to be followed to maintain the dose ALARA.

D. In addition to the requirements of this part, a licensee or registrant subject to the provisions of the EPA's generally applicable environmental radiation standards in 40 CFR 190 shall comply with those standards.

E. The department may impose additional restrictions on radiation levels in unrestricted areas and on the total quantity of radionuclides that a licensee or registrant may release in effluents in order to restrict the collective dose.

F. Notwithstanding Paragraph (1) of Subsection A of this section, a licensee may permit visitors to an individual who cannot be released, under Subsection I of 20.3.7.703 NMAC, to receive a radiation dose greater than 0.1 rem (1 millisievert) if:

(1) the radiation dose received does not exceed 0.5 rem (5 millisieverts); and

(2) the authorized user, as defined in 20.3.7 NMAC, has determined before the visit that it is appropriate.

[20.3.4.413 NMAC - Rp, 20.3.4.413 NMAC, 4/30/2009]

20.3.4.414 COMPLIANCE WITH DOSE LIMITS FOR INDIVIDUAL MEMBERS OF THE PUBLIC:

A. The licensee or registrant shall make or cause to be made surveys of radiation levels in unrestricted and controlled areas and radioactive materials in effluents released to unrestricted and controlled areas to demonstrate compliance with the dose limits in 20.3.4.413 NMAC for individual members of the public.

B. A licensee or registrant shall show compliance with the annual dose limit in 20.3.4.413 NMAC by:

(1) demonstrating by measurement or calculation that the total effective dose equivalent to the individual likely to receive the highest dose from the licensed or registered operation does not exceed the annual dose limit; or

(2) demonstrating that:

(a) the annual average concentrations of radioactive material released in gaseous and liquid effluents at the boundary of the unrestricted area do not exceed the values specified in table II of 20.3.4.461 NMAC; and

(b) if an individual were continuously present in an unrestricted area, the dose from external sources would not exceed 0.002 rem (0.02 millisievert) in an hour and 0.05 rem (0.5 millisievert) in a year.

C. Upon approval from the department, the licensee or registrant may adjust the effluent concentration values in table II of 20.3.4.461 NMAC for members of the public, to take into account the actual physical and chemical characteristics of the effluents, such as, aerosol size distribution, solubility, density, radioactive decay equilibrium and chemical form.
[20.3.4.414 NMAC - Rp, 20.3.4.414 NMAC, 4/30/2009]

20.3.4.415 TESTING FOR LEAKAGE OR CONTAMINATION OF SEALED SOURCES:

A. The licensee in possession of any sealed source shall assure that:

(1) each sealed source, except as specified in Subsection B of this section, is tested for leakage or contamination and the test results are received before the sealed source is put into use unless the licensee has a certificate from the transferor indicating that the sealed source was tested within the frequencies specified in Paragraphs (2) and (3) of this subsection, before transfer to the licensee;

(2) each sealed source that is not designed to emit alpha particles is tested for leakage or contamination at intervals not to exceed 6 months, or at alternative intervals specified by the source manufacturer and as approved by the department, NRC or an agreement state;

(3) each sealed source that is designed to emit alpha particles is tested for leakage or contamination at intervals not to exceed 3 months, or at alternative intervals specified by the source manufacturer and as approved by the department, NRC or an agreement state;

(4) for each sealed source that is required to be tested for leakage or contamination, at any other time there is reason to suspect that the sealed source might have been damaged or might be leaking, the licensee shall assure that the sealed source is tested for leakage or contamination before further use;

(5) tests for leakage for all sealed sources, except brachytherapy sources manufactured to contain radium, shall be capable of detecting the presence of 0.005 microcuries (185 becquerels) of radioactive material on a test sample; test samples shall be taken from the sealed source or from the surfaces of the container in which the sealed source is stored or mounted on which one might expect contamination to accumulate; for a sealed source contained in a device, test samples are obtained when the source is in the "off" position;

(6) the test for leakage for brachytherapy sources manufactured to contain radium shall be capable of detecting an absolute leakage rate of 0.001 microcuries (37 becquerels) of radon-222 in a 24 hour period when the collection efficiency for radon-222 and its daughters has been determined with respect to collection method, volume and time; and

(7) tests for contamination from radium daughters shall be taken on the interior surface of brachytherapy source storage containers and shall be capable of detecting the presence of 0.005 microcuries (185 becquerels) of a radium daughter which has a half-life greater than 4 days.

B. A licensee need not perform tests for leakage or contamination on the following sealed sources:

(1) sealed sources containing only radioactive material with a half-life of less than 30 days;

(2) sealed sources containing only radioactive material as a gas;

(3) sealed sources containing 100 microcuries (3.7 megabecquerels) or less of beta or photon-emitting material or 10 microcuries (370 kilobecquerels) or less of alpha-emitting material;

(4) sealed sources containing only hydrogen-3;

(5) seeds of iridium-192 encased in nylon ribbon; and

(6) sealed sources, except teletherapy and brachytherapy sources, which are not being used and identified as in storage; however, the licensee shall test each such sealed source for leakage or contamination and receive the test results before any use or transfer of the source unless it has been tested for leakage or contamination within such frequency as specified in Paragraphs (2) and (3) of Subsection A of this section before the date of use or transfer.

C. Tests for leakage or contamination from sealed sources shall be performed by persons specifically authorized by the department.

D. Test results shall be kept in units of becquerel or microcurie and maintained for inspection by the department. Records of test results for sealed sources shall be made pursuant to 20.3.4.443 NMAC.

E. The following shall be considered evidence that a sealed source is leaking:

(1) the presence of 0.005 microcuries (185 becquerels) or more of removable contamination on any test sample;

(2) leakage of 0.001 microcuries (37 becquerels) of radon-222 per 24 hours for brachytherapy sources manufactured to contain radium; and

(3) the presence of removable contamination resulting from the decay of 0.005 microcuries (185 becquerels) or more of radium.

F. The licensee shall immediately withdraw a leaking sealed source from use and shall take action to prevent the spread of contamination. The leaking sealed source shall be repaired or disposed of in accordance with this part.

G. Reports of test results for leaking or contaminated sealed sources shall be made pursuant to 20.3.4.458 NMAC.

[20.3.4.415 NMAC - Rp, 20.3.4.415 NMAC, 4/30/2009]

20.3.4.416 GENERAL REQUIREMENTS FOR SURVEY AND MONITORING:

A. Each licensee or registrant shall make, or cause to be made, surveys of areas, including the subsurface, that:

- (1) may be necessary to demonstrate compliance with this part; and
- (2) are necessary under the circumstances to evaluate:
 - (a) the magnitude and extent of radiation levels;
 - (b) concentrations or quantities of radioactive material and residual radioactivity;
 - (c) the potential radiological hazards of the radiation levels and residual radioactivity detected; and

(d) notwithstanding 10 CFR 20 or equivalent state regulations of this part, records from surveys describing the location and amount of subsurface residual radioactivity identified at the site must be kept with records important for decommissioning, and such records must be retained in accordance with the applicable regulations in 10 CFR parts 30, 40, 50, 70, or 72.30 or equivalent state regulations.

B. The licensee or registrant shall ensure that instruments and equipment used for quantitative radiation measurements (e.g. dose rate and effluent monitoring) are calibrated at intervals not to exceed 12 months, except when a more frequent interval is specified in another applicable part of this chapter or in a license condition.

C. All personnel dosimeters (except for direct and indirect reading pocket ionization chambers and those dosimeters used to measure the dose to the extremity) that require processing to determine the radiation dose and that are used by licensees and registrants to comply with 20.3.4.405 NMAC, with other applicable provisions of this chapter or with conditions specified in a license or registration shall be processed and evaluated by a dosimetry processor:

(1) holding current personnel dosimetry accreditation from the national voluntary laboratory accreditation program (NVLAP) of the national institute of standards and technology (NIST); and

(2) approved in this accreditation process for the type of radiation or radiations included in the national voluntary laboratory accreditation program (NVLAP) program that most closely approximates the type of radiation or radiations for which the individual wearing the dosimeter is monitored.

D. The licensee or registrant shall ensure that adequate precautions are taken to prevent a deceptive exposure of an individual monitoring device.

[20.3.4.416 NMAC - Rp, 20.3.4.416 NMAC, 4/30/2009; A, 6/13/2017]

20.3.4.417 CONDITIONS REQUIRING INDIVIDUAL MONITORING OF EXTERNAL AND

INTERNAL OCCUPATIONAL DOSE: Each licensee or registrant shall monitor exposures from sources of radiation at levels sufficient to demonstrate compliance with the occupational dose limits of this part. As a minimum the following requirements shall be met.

A. Each licensee or registrant shall monitor occupational exposure to radiation from licensed and unlicensed radiation sources under the control of the licensee or registrant and shall supply and require the use of individual monitoring devices by:

(1) adults likely to receive, in 1 year from sources external to the body, a dose in excess of 10 percent of the limits in Subsection A of 20.3.4.405 NMAC;

(2) minors likely to receive, in 1 year, from radiation sources external to the body, a deep dose equivalent in excess of 0.1 rem (1 millisievert), a lens dose equivalent in excess of 0.15 rem (1.5 millisieverts), or a shallow dose equivalent to the skin or to the extremities in excess of 0.5 rem (5 millisieverts);

(3) declared pregnant women likely to receive during the entire pregnancy, from radiation sources external to the body, a deep dose equivalent in excess of 0.1 rem (1 millisievert) (note: all of the occupational doses in Subsection A of 20.3.4.405 NMAC continue to be applicable to the declared pregnant worker as long as the embryo/fetus dose limit is not exceeded);

(4) individuals entering a high or very high radiation area; and

(5) individuals working with medical fluoroscopic equipment:
(a) an individual monitoring device used for the dose to an embryo/fetus of a declared pregnant woman, pursuant to Subsection A of 20.3.4.412 NMAC, shall be located under the protective apron at the waist;
(b) an individual monitoring device used for eye dose equivalent shall be located at the neck, or an unshielded location closer to the eye, outside the protective apron; and
(c) when only one individual monitoring device is used to determine the effective dose equivalent for external radiation pursuant to Paragraph (2) of Subsection C of 20.3.4.405 NMAC, it shall be located at the neck outside the protective apron; when a second individual monitoring device is used, for the same purpose, it shall be located under the protective apron at the waist; the second individual monitoring device is required for a declared pregnant woman.

B. Each licensee or registrant shall monitor (see 20.3.4.408 NMAC) the occupational intake of radioactive material by and assess the committed effective dose equivalent to:

(1) adults likely to receive, in 1 year, an intake in excess of 10 percent of the applicable ALI(s) in columns 1 and 2 of table I of 20.3.4.461 NMAC;

(2) minors likely to receive, in 1 year, a committed effective dose equivalent in excess of 0.1 rem (1 millisievert); and

(3) declared pregnant women likely to receive, during the entire pregnancy, a committed effective dose equivalent in excess of 0.1 rem (1 millisievert).

C. Each licensee or registrant shall ensure that individuals who are required to monitor occupational doses in accordance with Subsection A of this section wear individual monitoring devices as follows:

(1) an individual monitoring device used for monitoring the dose to the whole body shall be worn at the unshielded location of the whole body likely to receive the highest exposure; when a protective apron is worn, the location of the individual monitoring device is typically at the neck (collar); or

(2) an individual monitoring device used for monitoring the dose to an embryo/fetus of a declared pregnant woman, pursuant to Subsection A of 20.3.4.412 NMAC, shall be located at the waist under any protective apron being worn by the woman; or

(3) an individual monitoring device used for monitoring the eye dose equivalent, to demonstrate compliance with Subparagraph (a) of Paragraph (2) of Subsection A of 20.3.4.405 NMAC, shall be located at the neck (collar), outside any protective apron being worn by the monitored individual, or at an unshielded location closer to the eye; or

(4) an individual monitoring device used for monitoring the dose to the extremities, to demonstrate compliance with Subparagraph (b) of Paragraph (2) of Subsection A of 20.3.4.405 NMAC, shall be worn on the extremity likely to receive the highest exposure; each individual monitoring device shall be oriented to measure the highest dose to the extremity being monitored.

[20.3.4.417 NMAC - Rp, 20.3.4.417 NMAC, 4/30/2009]

20.3.4.418 CONTROL OF ACCESS TO HIGH RADIATION AREAS:

A. The licensee or registrant shall ensure that each entrance or access point to a high radiation area has one or more of the following features:

(1) a control device that, upon entry into the area, causes the level of radiation to be reduced below that level at which an individual might receive a deep dose equivalent of 0.1 rem (1 millisievert) in 1 hour at 30 centimeters from the source of radiation or from any surface that the radiation penetrates; or

(2) a control device that energizes a conspicuous visible or audible alarm signal so that the individual entering the high radiation area and the supervisor of the activity are made aware of the entry; or

(3) entryways that are locked, except during periods when access to the areas is required, with positive control over each individual entry.

B. In place of the controls required by Subsection A of this section for a high radiation area, the licensee or registrant may substitute continuous direct or electronic surveillance that is capable of preventing unauthorized entry.

C. The licensee or registrant may apply to the department for approval of alternative methods for controlling access to high radiation areas.

D. The licensee or registrant shall establish the controls required by Subsections A and C of this section in a way that does not prevent individuals from leaving a high radiation area.

1 **E.** The licensee or registrant is not required to control each entrance or access point to a room or
2 other area that is a high radiation area solely because of the presence of radioactive materials prepared for transport,
3 and packaged and labeled in accordance with the regulations of the DOT provided that:

- 4 (1) the packages do not remain in the area longer than 3 days; and
5 (2) the dose rate at 1 meter from the external surface of any package does not exceed 0.01
6 rem (0.1 millisievert) per hour.

7 **F.** The licensee or registrant is not required to control entrance or access to rooms or other areas in
8 hospitals solely because of the presence of patients containing radioactive material, provided that there are personnel
9 in attendance who are taking the necessary precautions to prevent the exposure of individuals to radiation or
10 radioactive material in excess of the established limits in this part and to operate within the ALARA provisions of
11 the licensee's or registrant's radiation protection program.
12 [20.3.4.418 NMAC - Rp, 20.3.4.418 NMAC, 4/30/2009]
13

14 **20.3.4.419 CONTROL OF ACCESS TO VERY HIGH RADIATION AREAS:** In addition to the
15 requirements in 20.3.4.418 NMAC, the licensee or registrant shall institute measures to ensure that an individual is
16 not able to gain unauthorized or inadvertent access to areas in which radiation levels could be encountered at 500
17 rads (5 grays) or more in 1 hour at 1 meter from a source of radiation or any surface through which the radiation
18 penetrates.
19 [20.3.4.419 NMAC - Rp, 20.3.4.419 NMAC, 4/30/2009]
20

21 **20.3.4.420 CONTROL OF ACCESS TO VERY HIGH RADIATION AREAS - IRRADIATORS:** In
22 addition to the requirements in 20.3.4.419 NMAC, the licensee shall comply with the requirements specified in
23 20.3.15 NMAC for access control.
24 [20.3.4.420 NMAC - Rp, 20.3.4.420 NMAC, 4/30/2009]
25

26 **20.3.4.421 USE OF PROCESS OR OTHER ENGINEERING CONTROLS:** The licensee or registrant
27 shall use, to the extent practicable, process or other engineering controls, such as, containment, decontamination or
28 ventilation, to control the concentrations of radioactive material in air.
29 [20.3.4.421 NMAC - Rp, 20.3.4.421 NMAC, 4/30/2009]
30

31 **20.3.4.422 USE OF OTHER CONTROLS:**

32 **A.** When it is not practical to apply process or other engineering controls to control the concentrations
33 of radioactive material in the air to values below those that define an airborne radioactivity area, the licensee or
34 registrant shall, consistent with maintaining the total effective dose equivalent ALARA, increase monitoring and
35 limit intakes by one or more of the following means:

- 36 (1) control of access;
37 (2) limitation of exposure times;
38 (3) use of respiratory protection equipment; or
39 (4) other controls.

40 **B.** If the licensee or registrant performs an ALARA analysis to determine whether or not respirators
41 should be used, the licensee or registrant may consider safety factors other than radiological factors. The licensee or
42 registrant should also consider the impact of respirator use on workers' industrial health and safety.
43 [20.3.4.422 NMAC - Rp, 20.3.4.422 NMAC, 4/30/2009]
44

45 **20.3.4.423 USE OF INDIVIDUAL RESPIRATORY PROTECTION EQUIPMENT:** The requirements
46 of this section apply to licensees and registrants who assign or permit the use of respiratory protection equipment to
47 limit the intake of radioactive material.

48 **A.** The licensee or registrant shall use only respiratory protection equipment that is tested and
49 certified by the national institute for occupational safety and health (NIOSH) except as otherwise noted in this part.

50 **B.** If the licensee or registrant wishes to use equipment that has not been tested or certified by
51 national institute for occupational safety and health (NIOSH), or for which there is no schedule for testing or
52 certification, the licensee or registrant shall submit an application to the department for authorized use of this
53 equipment except as provided in this part. The application shall include evidence that the material and performance
54 characteristics of the equipment are capable of providing the proposed degree of protection under anticipated
55 conditions of use. This shall be demonstrated either by testing made by the licensee or registrant, or on the basis of
56 reliable test information.

1 **C.** The licensee or registrant shall implement and maintain a respiratory protection program that
2 includes:
3 (1) air sampling sufficient to identify the potential hazard, permit proper equipment selection
4 and estimate doses;
5 (2) surveys and bioassays, as necessary, to evaluate actual intakes;
6 (3) testing of respirators for operability (user seal check for face sealing devices and
7 functional check for others) immediately prior to each use;
8 (4) written procedures regarding:
9 (a) monitoring, including air sampling and bioassays;
10 (b) supervision and training of respirator users;
11 (c) fit testing;
12 (d) respirator selection;
13 (e) breathing air quality;
14 (f) inventory and control;
15 (g) storage, issuance, maintenance, repair, testing and quality assurance of
16 respiratory protection equipment;
17 (h) recordkeeping; and
18 (i) relief from respirator use and limitations on periods of respirator use;
19 (5) determination by a physician that the individual user is medically fit to use respiratory
20 protection equipment; before:
21 (a) the initial fitting of a face sealing respirator;
22 (b) before the first field use of non-face sealing respirators; and
23 (c) either every 12 months thereafter, or periodically at a frequency determined by a
24 physician;
25 (6) fit testing, with fit factor greater than or equal to 10 times the APF for negative pressure
26 devices, and a fit factor that is greater than or equal to 500 for any positive pressure, continuous flow, and pressure-
27 demand devices, before the first field use of tight fitting, face-sealing respirators and periodically thereafter at a
28 frequency not to exceed 1 year; fit testing shall be performed with the facepiece operating in the negative pressure
29 mode.

30 **D.** The licensee or registrant shall advise each respirator user that the user may leave the area at any
31 time for relief from respirator use in the event of equipment malfunction, physical or psychological distress,
32 procedural or communication failure, significant deterioration of operating conditions or any other conditions that
33 might require such relief.

34 **E.** The licensee or registrant shall also consider limitations appropriate to the type and mode of use.
35 When selecting respiratory devices the licensee or registrant shall provide for vision correction, adequate
36 communication, low temperature work environments and the concurrent use of other safety or radiological
37 protection equipment. The licensee or registrant shall use equipment in such a way as not to interfere with the
38 proper operation of the respirator.

39 **F.** Standby rescue persons are required whenever one-piece atmosphere-supplying suits, or any
40 combination of supplied air respiratory protection device and personnel protective equipment are used from which
41 an unaided individual would have difficulty extricating himself or herself. The standby persons shall be equipped
42 with respiratory protection devices or other apparatus appropriate for the potential hazards. The standby rescue
43 persons shall observe or otherwise maintain continuous communication with the workers (visual, voice, signal line,
44 telephone, radio or other suitable means), and be immediately available to assist them in case of a failure of the air
45 supply or for any other reason that requires relief from distress. A sufficient number of standby rescue persons shall
46 be immediately available to assist all users of this type of equipment and to provide effective emergency rescue if
47 needed.

48 **G.** Atmosphere-supplying respirators shall be supplied with respirable air of grade D quality or better
49 as defined by the compressed gas association in publication G-7.1, *commodity specification for air*, 1997, and
50 included in the regulations of the occupational safety and health administration at 29 CFR 1910.134(i)(1)(ii)(A)
51 through (E). Grade D quality air criteria include:
52 (1) oxygen content (v/v) of 19.5-23.5 percent;
53 (2) hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less;
54 (3) carbon monoxide content of 10 parts per million (ppm) or less;
55 (4) carbon dioxide content of 1,000 parts per million (ppm) or less; and
56 (5) lack of noticeable odor.

1 **H.** The licensee or registrant shall ensure that no objects, materials or substances, such as facial hair,
2 or any conditions that interfere with the face-facepiece seal or valve function, and that are under the control of the
3 respirator wearer, are present between the skin of the wearer's face and the sealing surface of a tight-fitting respirator
4 facepiece.

5 **I.** In estimating the dose to individuals from intake of airborne radioactive materials, the
6 concentration of radioactive material in the air that is inhaled when respirators are worn is initially assumed to be the
7 ambient concentration in air without respiratory protection, divided by the assigned protection factor. If the dose is
8 later found to be greater than the estimated dose, the corrected value shall be used. If the dose is later found to be
9 less than the estimated dose, the corrected value may be used.

10 **J.** **Application for Use of Higher Assigned Protection Factors.** The licensee or registrant shall
11 obtain authorization from the department before using assigned protection factors in excess of those specified in
12 20.3.4.460 NMAC. The department may authorize a licensee or registrant to use higher assigned protection factors
13 on receipt of an application that:

14 (1) describes the situation for which a need exists for higher protection factors; and
15 (2) demonstrates that the respiratory protection equipment provides these higher protection
16 factors under the proposed conditions of use.

17 [20.3.4.423 NMAC - Rp, 20.3.4.423 NMAC, 4/30/2009]
18

19 **20.3.4.424 FURTHER RESTRICTIONS ON THE USE OF RESPIRATORY PROTECTION**

20 **EQUIPMENT:** The department may impose restrictions in addition to those in sections 20.3.4.422 NMAC,
21 20.3.4.423 NMAC and 20.3.4.460 NMAC, in order to:

22 **A.** ensure that the respiratory protection program of the licensee or registrant is adequate to limit
23 doses to individuals from intakes of airborne radioactive materials consistent with maintaining total effective dose
24 equivalent ALARA; and

25 **B.** limit the extent to which a licensee or registrant may use respiratory protection equipment instead
26 of process or other engineering controls.

27 [20.3.4.424 NMAC - Rp, 20.3.4.424 NMAC, 4/30/2009]
28

29 **20.3.4.425 SECURITY AND CONTROL OF LICENSED OR REGISTERED SOURCES OF**
30 **RADIATION:**

31 **A.** The licensee shall secure from unauthorized removal or access licensed materials that are stored in
32 controlled or unrestricted areas. The licensee possessing category 1 and category 2 quantities of radioactive
33 materials shall comply with 10 CFR 37. The licensee shall comply with 10 CFR 37 except as follows:

34 (1) any reference to the commission or NRC shall be deemed a reference to the department;

35 (2) 10 CFR 37.5 definitions of agreement state, byproduct material, commission and person
36 shall not be applicable;

37 (3) 10 CFR 37.7, 10 CFR 37.9, 10 CFR 37.11(a) and (b), 10 CFR 37.13, 10 CFR 37.27(c),
38 10 CFR 37.71, 10 CFR 37.105, and 10 CFR 37.107 shall not be applicable; and

39 (4) for any reporting or notification requirements that the licensee must follow in 10 CFR
40 37.45, 10 CFR 37.57, 10 CFR 37.77(a) through (d), and 10 CFR 37.81, the licensee shall use the following address
41 when applicable: New Mexico environment department/RCB, P.O. Box 5469, Santa Fe, NM 87502-5469 address
42 information.

43 **B.** The licensee shall control and maintain constant surveillance, and use devices or administrative
44 procedures to prevent unauthorized access to licensed radioactive material that is in a controlled or unrestricted area
45 and that is not in storage.

46 **C.** The registrant shall secure registered radiation machines from unauthorized removal.

47 **D.** The registrant shall use devices or administrative procedures to prevent unauthorized use of
48 registered radiation machines.

49 [20.3.4.425 NMAC - Rp, 20.3.4.425 NMAC, 4/30/2009; A, 8/10/2021]
50

51 **20.3.4.426 RADIOLOGICAL CRITERIA FOR LICENSE TERMINATION:**

52 **A.** **General provisions and scope.**

53 (1) The criteria in this part apply to the decommissioning of any facility licensed under this
54 chapter as well as other facilities subject to the department's jurisdiction under the Act. For low-level waste disposal
55 facilities licensed under 20.3.13 NMAC, the criteria apply only to ancillary surface facilities that support radioactive
56 waste disposal activities.

(2) The criteria in this section do not apply to sites which:
 (a) have been decommissioned prior to the effective date of the rule; or,
 (b) have previously submitted and received department approval on a license termination plan or decommissioning plan that is compatible with applicable department criteria.

(3) After a site has been decommissioned and the license terminated in accordance with the criteria in this section, the department will require additional cleanup only if, based on new information, it determines that the criteria of this section were not met and residual radioactivity remaining at the site could result in significant threat to public health and safety.

(4) When calculating TEDE to the average member of the critical group the licensee shall determine the peak annual TEDE dose expected within the first 1000 years after decommissioning.

B. Radiological criteria for unrestricted use. A site will be considered acceptable for unrestricted use if the residual radioactivity that is distinguishable from background radiation results in a TEDE to an average member of the critical group that does not exceed 25 millirems (0.25 millisievert) per year, including that from groundwater sources of drinking water, and the residual radioactivity has been reduced to levels that are ALARA. Determination of the levels which are ALARA must take into account consideration of any detriments, such as deaths from transportation accidents, expected to potentially result from decontamination and waste disposal.

C. Criteria for License Termination under Restricted Conditions. A site will be considered acceptable for license termination under restricted conditions if:

(1) the licensee can demonstrate that further reductions in residual radioactivity necessary to comply with the provisions of Subsection B of this section would result in net public or environmental harm or were not being made because the residual levels associated with restricted conditions are ALARA; determination of the levels which are ALARA must take into account consideration of any detriments, such as traffic accidents, expected to potentially result from decontamination and waste disposal;

(2) the licensee has made provisions for legally enforceable institutional controls that provide reasonable assurance that the TEDE from residual radioactivity distinguishable from background to the average member of the critical group will not exceed 25 millirems (0.25 millisievert) per year;

(3) the licensee has provided sufficient financial assurance to enable an independent third party, including a governmental custodian of a site, to assume and carry out responsibilities for any necessary control and maintenance of the site; acceptable financial assurance mechanisms are:

(a) funds placed into a trust segregated from the licensee's assets and outside the licensee's administrative control, and in which the adequacy of the trust funds is to be assessed based on an assumed annual one percent real rate of return on investment;

(b) surety method, insurance, or other guarantee method as described in Paragraph (2) of Subsection F of 20.3.3.311 NMAC;

(c) a statement of intent in the case of federal, state, or local government licensees, as described in Paragraph (4) of Subsection F of 20.3.3.311 NMAC; or

(d) when a governmental entity is assuming custody and ownership of a site, an arrangement that is deemed acceptable by such governmental entity;

(4) the licensee has submitted a decommissioning plan or license termination plan to the department indicating the licensee's intent to decommission in accordance with Subsection E of 20.3.3.318 NMAC, and specifying that the licensee intends to decommission by restricting use of the site; the licensee shall document in the license termination plan or decommissioning plan how the advice of individuals and institutions in the community who may be affected by the decommissioning has been sought and incorporated, as appropriate, following analysis of that advice:

(a) licensees proposing to decommission by restricting use of the site shall seek advice from such affected parties regarding the following matters concerning the proposed decommissioning:

(i) whether provisions for institutional controls proposed by the licensee:

1) will provide reasonable assurance that the TEDE from residual radioactivity distinguishable from background to the average member of the critical group will not exceed 25 millirems (0.25 millisievert) TEDE per year; 2) will be enforceable; and 3) will not impose undue burdens on the local community or other affected parties;

(ii) whether the licensee has provided sufficient financial assurance to enable an independent third party, including a governmental custodian of a site, to assume and carry out responsibilities for any necessary control and maintenance of the site;

(b) in seeking advice on the issues identified in Subparagraph (a) of this paragraph, the licensee shall provide for:

(i) participation by representatives of a broad cross section of community interests who may be affected by the decommissioning;

(ii) an opportunity for a comprehensive, collective discussion on the issues by the participants represented; and

(iii) a publicly available summary of the results of all such discussions, including a description of the individual viewpoints of the participants on the issues and the extent of agreement and disagreement among the participants on the issues; and

(5) residual radioactivity at the site has been reduced so that if the institutional controls were no longer in effect, there is reasonable assurance that the TEDE from residual radioactivity distinguishable from background to the average member of the critical group is ALARA and would not exceed either:

(a) 100 millirems (1 millisievert) per year; or

(b) 500 millirems (5 millisieverts) per year provided the licensee:

(i) demonstrates that further reductions in residual radioactivity necessary to comply with the 100 millirems per year (1 millisievert per year) value of Subparagraph (a) of this paragraph are not technically achievable, would be prohibitively expensive, or would result in net public or environmental harm;

(ii) makes provisions for durable institutional controls; and

(iii) provides sufficient financial assurance to enable a responsible government entity or independent third party, including a governmental custodian of a site, both to carry out periodic rechecks of the site no less frequently than every five years to assure that the institutional controls remain in place as necessary to meet the criteria of Paragraph (2) of this subsection and to assume and carry out responsibilities for any necessary control and maintenance of those controls; acceptable financial assurance mechanisms are those in Paragraph (3) of this subsection.

D. Alternate Criteria for License Termination.

(1) The department may terminate a license using alternate criteria greater than the dose criterion of Subsection B of this section, Paragraph (2) of Subsection C of this section, and Item (i) of Subparagraph (a) of Paragraph (4) of Subsection C of this section, if the licensee:

(a) provides assurance that public health and safety would continue to be protected, and that it is unlikely that the dose from all man-made sources combined, other than medical, would be more than the 100 millirems per year (1 millisievert per year) limit of 20.3.4.413 NMAC, by submitting an analysis of possible sources of exposure;

(b) has employed to the extent practical restrictions on site use according to the provisions of Subsection C of this section in minimizing exposures at the site;

(c) reduces doses to ALARA levels, taking into consideration any detriments such as traffic accidents expected to potentially result from decontamination and waste disposal; and

(d) has submitted a decommissioning plan or license termination plan to the department indicating the licensee's intent to decommission in accordance with Subsection E of 20.3.3.318 NMAC, and specifying that the licensee proposes to decommission by use of alternate criteria; the licensee shall document in the decommissioning plan or license termination plan how the advice of individuals and institutions in the community who may be affected by the decommissioning has been sought and addressed, as appropriate, following analysis of that advice; in seeking such advice, the licensee shall provide for:

(i) participation by representatives of a broad cross section of community interests who may be affected by the decommissioning;

(ii) an opportunity for a comprehensive, collective discussion on the issues by the participants represented; and

(iii) a publicly available summary of the results of all such discussions, including a description of the individual viewpoints of the participants on the issues and the extent of agreement and disagreement among the participants on the issues.

(e) Has provided sufficient financial assurance in the form of a trust fund to enable an independent third party, including a governmental custodian of a site, to assume and carry out responsibilities for any necessary control and maintenance of the site.

(2) The use of alternate criteria to terminate a license requires the approval of the department after consideration of the department staff's recommendations that will address any comments provided by state and federal agencies and any public comments submitted pursuant to Subsection E of this section.

E. Public Notification and Public Participation. Upon the receipt of a license termination plan or decommissioning plan from the licensee, or a proposal by the licensee for release of a site pursuant to Subsection C or D of this section, or whenever the department deems such notice to be in the public interest, the department shall:

- (1) notify and solicit comments from:
- (a) local governments in the vicinity of the site and any Indian nation or other indigenous people that have treaty or statutory rights that could be affected by the decommissioning; and
- (b) the EPA for cases where the licensee proposes to release a site pursuant to Subsection D of this section; and
- (2) publish a notice in the state register and in a forum, such as local newspapers, letters to state or local organizations, or other appropriate forum, that is readily accessible to individuals in the vicinity of the site, and solicit comments from the public and affected parties; further, that the public notice may be published in any language when appropriate.

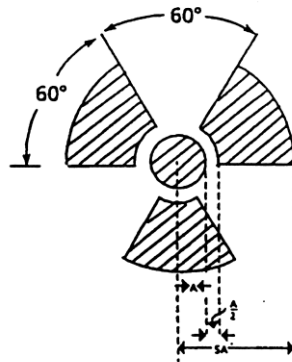
F. Minimization of contamination. Licensee shall, to the extent practical, conduct operations to minimize the introduction of residual radioactivity into the site, including the subsurface, in accordance with the existing radiation protection requirements in 20.3.4.404 NMAC and the radiological criteria for license termination in 20.3.4.426 NMAC.

[20.3.4.426 NMAC - Rp, 20.3.4.426 NMAC, 4/30/2009; A, 6/13/2017]

20.3.4.427 CAUTION SIGNS:

A. Standard Radiation Symbol. Unless otherwise authorized by the department, the symbol prescribed by this section shall use the colors magenta, purple or black on yellow background. The symbol prescribed is the three-bladed design as follows:

- (1) cross-hatched area is to be magenta, purple or black; and
- (2) the background is to be yellow.



B. Exception to Color Requirements for Standard Radiation Symbol. Notwithstanding the requirements of Subsection A of this section, licensees or registrants are authorized to label sources, source holders or device components containing sources of radiation that are subjected to high temperatures, with conspicuously etched or stamped radiation caution symbols and without a color requirement.

C. Additional Information on Signs and Labels. In addition to the contents of signs and labels prescribed in this part, the licensee or registrant shall provide, on or near the required signs and labels, additional information, as appropriate, to make individuals aware of potential radiation exposures and to minimize the exposures.

[20.3.4.427 NMAC - Rp, 20.3.4.427 NMAC, 4/30/2009]

20.3.4.428 POSTING REQUIREMENTS:

A. Posting of Radiation Areas. The licensee or registrant shall post each radiation area with a conspicuous sign or signs bearing the radiation symbol and the words "Caution, Radiation Area."

1 **B. Posting of High Radiation Areas.** The licensee or registrant shall post each high radiation area
2 with a conspicuous sign or signs bearing the radiation symbol and the words "Caution, High Radiation Area" or
3 "Danger, High Radiation Area."

4 **C. Posting of Very High Radiation Areas.** The licensee or registrant shall post each very high
5 radiation area with a conspicuous sign or signs bearing the radiation symbol and words "Grave Danger, Very High
6 Radiation Area."

7 **D. Posting of Airborne Radioactivity Areas.** The licensee or registrant shall post each airborne
8 radioactivity area with a conspicuous sign or signs bearing the radiation symbol and the words "Caution, Airborne
9 Radioactivity Area" or "Danger, Airborne Radioactivity Area."

10 **E. Posting of Areas or Rooms in Which Licensed or Registered Material is Used or Stored.** The
11 licensee or registrant shall post each area or room in which there is used or stored an amount of licensed or
12 registered material exceeding 10 times the quantity of such material specified in 20.3.4.462 NMAC with a
13 conspicuous sign or signs bearing the radiation symbol and the words "Caution, Radioactive Material" or "Danger,
14 Radioactive Material."

15 [20.3.4.428 NMAC - Rp, 20.3.4.428 NMAC, 4/30/2009]

16
17 **20.3.4.429 EXCEPTIONS TO POSTING REQUIREMENTS:**

18 **A.** A licensee or registrant is not required to post caution signs in areas or rooms containing sources
19 of radiation for periods of less than 8 hours, if each of the following conditions is met:

20 **(1)** the sources of radiation are constantly attended during these periods by an individual who
21 takes the precautions necessary to prevent the exposure of individuals to sources of radiation in excess of the limits
22 established in this part; and

23 **(2)** the area or room is subject to the licensee's or registrant's control.

24 **B.** Rooms or other areas in hospitals that are occupied by patients are not required to be posted with
25 caution signs pursuant to 20.3.4.428 NMAC provided that the patient could be released from licensee control
26 pursuant to Subsection I of 20.3.7.703 NMAC.

27 **C.** A room or area is not required to be posted with a caution sign because of the presence of a sealed
28 source provided the radiation level at 30 centimeters from the surface of the sealed source container or housing does
29 not exceed 0.005 rem (0.05 millisievert) per hour.

30 **D.** A room or area is not required to be posted with a caution sign because of the presence of
31 radiation machines provided the radiation level at 30 centimeters from the radiation machine housing does not
32 exceed 0.005 rem (0.05 millisievert) per hour.

33 **E.** Rooms in hospitals or clinics that are used for teletherapy are exempt from the requirement to post
34 caution signs under 20.3.4.428 NMAC if:

35 **(1)** access to the room is controlled pursuant to Subsection E of 20.3.7.711 NMAC; and

36 **(2)** personnel in attendance take necessary precautions to prevent the inadvertent exposure of
37 workers, other patients and members of the public to radiation in excess of the limits established in this part.

38 [20.3.4.429 NMAC - Rp, 20.3.4.429 NMAC, 4/30/2009]

39
40 **20.3.4.430 LABELING CONTAINERS AND RADIATION MACHINES:**

41 **A.** The licensee or registrant shall ensure that each container of licensed or registered material bears a
42 durable, clearly visible label bearing the radiation symbol and the words "Caution, Radioactive Material" or
43 "Danger, Radioactive Material." The label shall also provide information, such as the radionuclides present, an
44 estimate of the quantity of radioactivity, the date for which the activity is estimated, radiation levels, kinds of
45 materials and mass enrichment, to permit individuals handling or using the containers, or working in the vicinity of
46 the containers, to take precautions to avoid or minimize exposures.

47 **B.** Each licensee or registrant shall, prior to removal or disposal of empty uncontaminated containers
48 to unrestricted areas, remove or deface the radioactive material label or otherwise clearly indicate that the container
49 no longer contains radioactive materials.

50 **C.** Each registrant shall ensure that each radiation machine is labeled in a conspicuous manner which
51 cautions individuals that radiation is produced when it is energized.

52 [20.3.4.430 NMAC - Rp, 20.3.4.430 NMAC, 4/30/2009]

53
54 **20.3.4.431 EXEMPTIONS TO LABELING REQUIREMENTS:** A licensee is not required to label:

55 **A.** containers holding licensed material in quantities less than the quantities listed in 20.3.4.462
56 NMAC;

- 1 **B.** containers holding licensed material in concentrations less than those specified in table III of
2 20.3.4.461 NMAC;
- 3 **C.** containers attended by an individual who takes the precautions necessary to prevent the exposure
4 of individuals in excess of the limits established by this part;
- 5 **D.** containers when they are in transport and packaged and labeled in accordance with the regulations
6 of the DOT (labeling of packages containing radioactive materials is required by the DOT if the amount and type of
7 radioactive material exceeds the limits for an excepted quantity or article as defined and limited by DOT regulations
8 49 CFR 173.403 (m) and (w) and 173.421-424);
- 9 **E.** containers that are accessible only to individuals authorized to handle or use them, or to work in
10 the vicinity of the containers, if the contents are identified to these individuals by a readily available written record;
11 examples of containers of this type are containers in locations such as water-filled canals, storage vaults or hot cells;
12 the record shall be retained as long as the containers are in use for the purpose indicated on the record; or
- 13 **F.** installed manufacturing or process equipment, such as piping and tanks.
14 [20.3.4.431 NMAC - Rp, 20.3.4.431 NMAC, 4/30/2009]
15

16 **20.3.4.432 PROCEDURES FOR RECEIVING AND OPENING PACKAGES:**

- 17 **A.** Each licensee who expects to receive a package containing quantities of radioactive material in
18 excess of a type A quantity, as defined in Subsection A of 20.3.3.306 NMAC, incorporating 10 CFR 71.4 and
19 Appendix A of 10 CFR 71, shall make arrangements to receive:
- 20 (1) the package when the carrier offers it for delivery; or
21 (2) the notification of the arrival of the package at the carrier's terminal and to take
22 possession of the package expeditiously.
- 23 **B.** Each licensee shall:
- 24 (1) monitor the external surfaces of a labeled (with a radioactive white I, yellow II or yellow
25 III label as specified in DOT regulations 49 CFR 172.403 and 172.436-440) package for radioactive contamination
26 unless the package contains only radioactive material in the form of gas or in special form as defined in 10 CFR
27 71.4;
- 28 (2) monitor the external surfaces of a labeled package for radiation levels unless the package
29 contains quantities of radioactive material that are less than or equal to the type A quantity, as defined in Subsection
30 A of 20.3.3.306 NMAC, incorporating 10 CFR 71.4 and Appendix A to 10 CFR 71; and
- 31 (3) monitor all packages known to contain radioactive material for radioactive contamination
32 and radiation levels if there is evidence of degradation of package integrity, such as packages that are crushed, wet
33 or damaged.
- 34 **C.** The licensee shall perform the monitoring required by Subsection B of this section as soon as
35 practicable after receipt of the package, but not later than 3 hours after the package is received at the licensee's
36 facility if it is received during the licensee's normal working hours. If a package is received after working hours, the
37 package shall be monitored no later than three hours from the beginning of the next working day.
- 38 **D.** The licensee shall immediately notify the final delivery carrier and, by telephone and written
39 communication which can include e-mail, telegram, mailgram or facsimile, the department when:
- 40 (1) removable radioactive surface contamination exceeds the limits of 20.3.3.306 NMAC,
41 incorporating 10 CFR 71.87(i); or
- 42 (2) external radiation levels exceed the limits of 20.3.3.306 NMAC, incorporating 10 CFR
43 71.47.
- 44 **E.** Each licensee shall:
- 45 (1) establish, maintain and retain written procedures for safely opening packages in which
46 radioactive material is received; and
- 47 (2) ensure that the procedures are followed and that due consideration is given to special
48 instructions for the type of package being opened.
- 49 **F.** Licensees transferring special form sources in vehicles owned or operated by the licensee to and
50 from a work site are exempt from the contamination monitoring requirements of Subsection B of this section, but are
51 not exempt from the survey requirement in Subsection B of this section for measuring radiation levels that ensures
52 that the source is still properly lodged in its shield.
53 [20.3.4.432 NMAC - Rp, 20.3.4.432 NMAC, 4/30/2009]
54

55 **20.3.4.433 WASTE DISPOSAL - GENERAL REQUIREMENTS:**

- 56 **A.** A licensee shall dispose of licensed material only:

(1) by transfer to an authorized recipient as provided in 20.3.4.438 NMAC or 20.3.3 NMAC, or to the DOE;

(2) by decay in storage;

(3) by release in effluents within the limits in 20.3.4.413 NMAC; or

(4) as authorized pursuant to 20.3.4.434 NMAC, 20.3.4.435 NMAC, 20.3.4.436 NMAC or 20.3.4.437 NMAC and in accordance with 20.3.4.439 NMAC.

B. A person shall be specifically licensed to receive waste containing licensed material from other persons for:

- (1) treatment prior to disposal;
- (2) treatment or disposal by incineration;
- (3) decay in storage;
- (4) disposal at a land disposal facility licensed pursuant to 20.3.13 NMAC;
- (5) storage until transferred to a storage or disposal facility authorized to receive the waste;

or

(6) disposal at a geologic repository under 10 CFR 60 or 10 CFR 63, specifically licensed by NRC.

[20.3.4.433 NMAC - Rp, 20.3.4.433 NMAC, 4/30/2009]

20.3.4.434 METHOD FOR OBTAINING APPROVAL OF PROPOSED DISPOSAL PROCEDURES:

A licensee or applicant for a license may apply to the department for approval of proposed procedures, not otherwise authorized in these regulations, to dispose of licensed material generated in the licensee's activities. Each application shall include:

- A.** a description of the waste containing licensed material to be disposed of, including the physical and chemical properties important to risk evaluation, and the proposed manner and conditions of waste disposal;
- B.** an analysis and evaluation of pertinent information on the nature of the environment;
- C.** the nature and location of other potentially affected licensed and unlicensed facilities; and
- D.** analyses and procedures to ensure that doses are maintained ALARA and within the dose limits in this part.

[20.3.4.434 NMAC - Rp, 20.3.4.434 NMAC, 4/30/2009]

20.3.4.435 DISPOSAL BY RELEASE INTO SANITARY SEWAGE:

A. A licensee may discharge licensed material into sanitary sewerage if each of the following conditions is satisfied:

- (1) the material is readily soluble, or is readily dispersible biological material, in water;
- (2) the quantity of licensed or other radioactive material that the licensee releases into the sewer in 1 month divided by the average monthly volume of water released into the sewer by the licensee does not exceed the concentration listed in table III of 20.3.4.461 NMAC;
- (3) if more than one radionuclide is released, the following conditions must also be satisfied:
 - (a) the licensee shall determine the fraction of the limit in table III of 20.3.4.461 NMAC represented by discharges into sanitary sewerage by dividing the actual monthly average concentration of each radionuclide released by the licensee or registrant into the sewer by the concentration of that radionuclide listed in table III of 20.3.4.461 NMAC; and
 - (b) the sum of the fractions for each radionuclide required by Subparagraph (a) of Paragraph (3) of this subsection does not exceed unity; and
- (4) the total quantity of licensed or other radioactive material that the licensee releases into the sanitary sewerage in a year does not exceed 5 curies (185 gigabecquerels) of hydrogen-3, 1 curie (37 gigabecquerels) of carbon-14, and 1 curie (37 gigabecquerels) of all other radioactive materials combined.

B. Excreta from individuals undergoing medical diagnosis or therapy with radioactive material are not subject to the limitations contained in Subsection A of this section.

[20.3.4.435 NMAC - Rp, 20.3.4.435 NMAC, 4/30/2009]

20.3.4.436 TREATMENT OR DISPOSAL BY INCINERATION: A licensee may treat or dispose of licensed material by incineration only in the form and concentration specified in 20.3.4.437 NMAC or as specifically approved by the department pursuant to 20.3.4.434 NMAC.

[20.3.4.436 NMAC - Rp, 20.3.4.436 NMAC, 4/30/2009]

1 **20.3.4.437 DISPOSAL OF SPECIFIC WASTES:**

2 **A.** A licensee may dispose of the following licensed material as if it were not radioactive:

3 (1) 0.05 microcurie (1.85 kilobecquerels), or less, of hydrogen-3 or carbon-14 per gram of
4 medium used for liquid scintillation counting; and

5 (2) 0.05 microcurie (1.85 kilobecquerels), or less, of hydrogen-3 or carbon-14 per gram of
6 animal tissue, averaged over the weight of the entire animal.

7 **B.** A licensee shall not dispose of tissue pursuant to Paragraph (2) of Subsection A of this section in a
8 manner that would permit its use either as food for humans or as animal feed.

9 **C. Disposal of Certain Byproduct Material.**

10 (1) Licensed material as defined in Paragraphs (3), (4) and (5) of the definition of *byproduct*
11 *material* set forth in 20.3.1.7 NMAC may be disposed of in accordance with 20.3.13 NMAC even though it is not
12 defined as low-level radioactive waste. Therefore, any licensed radioactive material being disposed of at a facility,
13 or transferred for ultimate disposal at a facility licensed under 20.3.13 NMAC, must meet the requirements of
14 20.3.4.438 NMAC.

15 (2) A licensee may dispose of byproduct material as defined in Paragraphs (3), (4) and (5) of
16 the definition of *byproduct material* set forth in 20.3.1.7 NMAC, at a disposal facility authorize to dispose of such
17 material in accordance with any federal or state solid or hazardous waste law, including the Solid Waste Disposal
18 Act, as authorized under the Energy Policy Act.

19 **D.** The licensee shall maintain records of disposal in accordance with 20.3.4.448 NMAC.
20 [20.3.4.437 NMAC - Rp, 20.3.4.437 NMAC, 4/30/2009]

21
22 **20.3.4.438 TRANSFER FOR DISPOSAL AND MANIFESTS:**

23 **A.** The requirements of this section and 20.3.4.466 NMAC are designed to:

24 (1) control transfers of low-level radioactive waste by any waste generator, waste collector or
25 waste processor licensee, as defined in 20.3.4.466 NMAC (appendix G), who ships low-level waste either directly or
26 indirectly through a waste collector, waste broker or waste processor, to a licensed low-level waste land disposal
27 facility (as defined in 20.3.13 NMAC);

28 (2) establish a manifest tracking system; and

29 (3) supplement existing requirements concerning transfers and record keeping for those
30 wastes.

31 **B.** Each shipment of radioactive waste intended for disposal at a licensed land disposal facility must
32 be accompanied by a shipment manifest, which contains all the information on the NRC's *uniform low-level*
33 *radioactive waste manifest* (see 20.3.4.466 NMAC).

34 **C.** Any licensee shipping radioactive waste intended for ultimate disposal at a licensed land disposal
35 facility must document the information required on NRC's *uniform low-level radioactive waste manifest* and transfer
36 this recorded manifest information to the intended consignee in accordance with 20.3.4.466 NMAC.

37 **D.** Each shipment manifest must include a certification by the waste generator as specified in
38 Subsection B of 20.3.4.466 NMAC.

39 **E.** Each person involved in the transfer for disposal and disposal of waste, including the waste
40 generator, waste collector, waste processor and disposal facility operator, shall comply with the requirements
41 specified in Subsection C of 20.3.4.466 NMAC.

42 **F.** Any licensee shipping byproduct material as defined in Paragraphs (3), (4) and (5) of the
43 definition of *byproduct material* set forth in 20.3.4.7 NMAC intended for ultimate disposal at a land disposal facility
44 licensed under 20.3.13 NMAC must document the information required on the NRC's *uniform low-level radioactive*
45 *waste manifest* and transfer this recorded manifest information to the intended consignee in accordance with
46 20.3.4.466 NMAC.

47 [20.3.4.438 NMAC - Rp, 20.3.4.438 NMAC, 4/30/2009]

48
49 **20.3.4.439 COMPLIANCE WITH ENVIRONMENTAL AND HEALTH PROTECTION**

50 **REGULATIONS:** Nothing in sections 20.3.4.433 NMAC, 20.3.4.434 NMAC, 20.3.4.435 NMAC, 20.3.4.436
51 NMAC, 20.3.4.437 NMAC or 20.3.4.438 NMAC relieves the licensee from complying with other applicable
52 federal, state and local regulations governing any other toxic or hazardous properties of materials that may be
53 disposed of under these sections.

54 [20.3.4.439 NMAC - Rp, 20.3.4.439 NMAC, 4/30/2009]

55
56 **20.3.4.440 RECORDS - GENERAL PROVISIONS:**

1 A. Each licensee or registrant shall use the units: curie, rad, rem, including multiples and
2 subdivisions, and shall clearly indicate the units of all quantities on records required by this part.

3 B. In the records required by this part, the licensee or registrant may record quantities in SI units in
4 parentheses following each of the units specified in Subsection A of this section. However, all quantities must be
5 recorded as stated in Subsection A of this section.

6 C. Notwithstanding the requirements of Subsection A of this section, when recording information on
7 shipment manifests, as required in Subsection B of 20.3.4.438 NMAC, information must be recorded in the
8 international system of units (SI) or in SI and the units as specified in Subsection A of this section.

9 D. The licensee or registrant shall make a clear distinction among the quantities entered on the
10 records required by this part (e.g., total effective dose equivalent, shallow-dose equivalent, lens dose equivalent,
11 deep-dose equivalent, committed effective dose equivalent).

12 [20.3.4.440 NMAC - Rp, 20.3.4.440 NMAC, 4/30/2009; A, 6/30/2011]
13

14 **20.3.4.441 RECORDS OF RADIATION PROTECTION PROGRAMS:**

15 A. Each licensee or registrant shall maintain records of the radiation protection program, including:

16 (1) the provisions of the program; and

17 (2) audits and other reviews of program content and implementation.

18 B. The licensee or registrant shall retain the records required by Paragraph (1) of Subsection A of this
19 section until the department terminates each pertinent license or registration requiring the record. The licensee or
20 registrant shall retain the records required by Paragraph (2) of Subsection A of this section for 3 years after the
21 record is made.

22 [20.3.4.441 NMAC - Rp, 20.3.4.441 NMAC, 4/30/2009]
23

24 **20.3.4.442 RECORDS OF SURVEYS:**

25 A. Each licensee or registrant shall maintain records showing the results of surveys and calibrations
26 required by 20.3.4.416 NMAC and Subsection B of 20.3.4.432 NMAC. The licensee or registrant shall retain these
27 records for 3 years after the record is made.

28 B. The licensee or registrant shall retain each of the following records until the department terminates
29 each pertinent license or registration requiring the record:

30 (1) records of the results of surveys to determine the dose from external sources of radiation
31 and used, in the absence of or in combination with individual monitoring data, in the assessment of individual dose
32 equivalents;

33 (2) records of the results of measurements and calculations used to determine individual
34 intakes of radioactive material and used in the assessment of internal dose;

35 (3) records showing the results of air sampling, surveys and bioassays required pursuant to
36 Subparagraphs (a) and (b) of Paragraph (3) of Subsection A of 20.3.4.423 NMAC;

37 (4) records of the results of measurements and calculations used to evaluate the release of
38 radioactive effluents to the environment; and

39 (5) records from surveys describing the location and amount of subsurface residual
40 radioactivity identified at the site must be kept with records important for decommissioning, and such records must
41 be retained in accordance with 20.3.3 NMAC as applicable.

42 [20.3.4.442 NMAC - Rp, 20.3.4.442 NMAC, 4/30/2009; A, 6/13/2017]
43

44 **20.3.4.443 RECORDS OF TESTS FOR LEAKAGE OR CONTAMINATION OF SEALED**

45 **SOURCES:** Records of tests for leakage or contamination of sealed sources required by 20.3.4.415 NMAC shall be
46 kept in units of microcurie or becquerel, and maintained for inspection by the department for 5 years after the
47 records are made.

48 [20.3.4.443 NMAC - Rp, 20.3.4.443 NMAC, 4/30/2009]
49

50 **20.3.4.444 RECORDS OF PRIOR OCCUPATIONAL DOSE:**

51 A. The licensee or registrant shall retain the records of prior occupational dose and exposure history
52 as specified in 20.3.4.409 NMAC on department form *cumulative occupational dose history* or equivalent until the
53 department terminates each pertinent license or registration requiring this record. The licensee or registrant shall
54 retain records used in preparing department form *cumulative occupational dose history* or equivalent for 3 years
55 after the record is made.

1 **B.** Upon termination of the license or registration, the licensee or registrant shall permanently store
2 records on department form *cumulative occupational dose history* or equivalent, or shall make provision with the
3 department for transfer to the department.
4 [20.3.4.444 NMAC - Rp, 20.3.4.444 NMAC, 4/30/2009]

5
6 **20.3.4.445 RECORDS OF PLANNED SPECIAL EXPOSURES:**

7 **A.** For each use of the provisions of 20.3.4.410 NMAC for planned special exposures, the licensee or
8 registrant shall maintain records that describe:

- 9 (1) the exceptional circumstances requiring the use of a planned special exposure;
10 (2) the name of the management official who authorized the planned special exposure and a
11 copy of the signed authorization;
12 (3) what actions were necessary;
13 (4) why the actions were necessary;
14 (5) what precautions were taken to assure that doses were maintained ALARA;
15 (6) what individual and collective doses were expected to result; and
16 (7) the doses actually received in the planned special exposure.

17 **B.** The licensee or registrant shall retain the records until the department terminates each pertinent
18 license or registration requiring these records.

19 **C.** Upon termination of the license or registration, the licensee or registrant shall permanently store
20 records on department form *cumulative occupational dose history* or equivalent, or shall make provision with the
21 department for transfer to the department.
22 [20.3.4.445 NMAC - Rp, 20.3.4.445 NMAC, 4/30/2009]

23
24 **20.3.4.446 RECORDS OF INDIVIDUAL MONITORING RESULTS:**

25 **A. Record Keeping Requirement.** Each licensee or registrant shall maintain records of doses
26 received by all individuals for whom monitoring was required pursuant to 20.3.4.417 NMAC, and records of doses
27 received during planned special exposures, accidents and emergency conditions. Assessments of dose equivalent
28 and records made using units in effect before May 3, 1995 (see 20.3.4 NMAC codified as of May 3, 1995) need not
29 be changed. These records shall include, when applicable:

- 30 (1) the deep dose equivalent to the whole body, lens dose equivalent, shallow dose
31 equivalent to the skin and shallow dose equivalent to the extremities;
32 (2) the estimated intake of radionuclides (see 20.3.4.406 NMAC);
33 (3) the committed effective dose equivalent assigned to the intake of radionuclides;
34 (4) the specific information used to assess the committed effective dose equivalent pursuant
35 to Subsections A and C of 20.3.4.408 NMAC, and when required by 20.3.4.417 NMAC;
36 (5) the total effective dose equivalent when required by 20.3.4.406 NMAC; and
37 (6) the total of the deep dose equivalent and the committed dose to the organ receiving the
38 highest total dose.

39 **B. Record Keeping Frequency.** The licensee or registrant shall make entries of the records
40 specified in Subsection A of this section at intervals not to exceed 1 year.

41 **C. Record Keeping Format.** The licensee or registrant shall maintain the records specified in
42 Subsection A of this section on department form *occupational dose record for a monitoring period*, in accordance
43 with the instructions to the form, or in clear and legible records containing all the information required by the form.

44 **D.** The licensee or registrant shall maintain the records of dose to an embryo/fetus with the records of
45 dose to the declared pregnant woman. The declaration of pregnancy, including the estimated date of conception,
46 shall also be kept on file, but may be maintained separately from the dose records.

47 **E.** The licensee or registrant shall retain each required form or record until the department terminates
48 each pertinent license or registration requiring the record.

49 **F.** Upon termination of the license or registration, the licensee or registrant shall permanently store
50 records on department form *cumulative occupational dose history* or equivalent, or shall make provision with the
51 department for transfer to the department.

52 **G. Privacy Protection.** The records required under this section should be protected from public
53 disclosure because of their personal and private nature.

54 [20.3.4.446 NMAC - Rp, 20.3.4.446 NMAC, 4/30/2009]

55
56 **20.3.4.447 RECORDS OF DOSE TO INDIVIDUAL MEMBERS OF THE PUBLIC:**

1 **A.** Each licensee or registrant shall maintain records sufficient to demonstrate compliance with the
2 dose limit for individual members of the public (see 20.3.4.413 NMAC).

3 **B.** The licensee or registrant shall retain the records required by Subsection A of this section until the
4 department terminates each pertinent license or registration requiring the record.
5 [20.3.4.447 NMAC - Rp, 20.3.4.447 NMAC, 4/30/2009]

6
7 **20.3.4.448 RECORDS OF WASTE DISPOSAL:**

8 **A.** Each licensee shall maintain records of the disposal of licensed materials made pursuant to
9 20.3.4.434 NMAC, 20.3.4.435 NMAC, 20.3.4.436 NMAC, 20.3.4.437 NMAC and 20.3.3 NMAC.

10 **B.** Each registrant shall maintain records of the disposal of radiation machines.

11 **C.** The licensee or registrant shall retain the records required by Subsections A and B of this section
12 until the department terminates each pertinent license or registration requiring the record.
13 [20.3.4.448 NMAC - Rp, 20.3.4.448 NMAC, 4/30/2009]

14
15 **20.3.4.449 [RESERVED]**

16
17 **20.3.4.450 FORM OF RECORDS:** Each record required by this part shall be legible throughout the
18 specified retention period. The record shall be the original or a reproduced copy or a microform, provided that the
19 copy or microform is authenticated by authorized personnel and that the microform is capable of producing a clear
20 copy throughout the required retention period or the record may also be stored in electronic media with the
21 capability for producing legible, accurate and complete records during the required retention period. Records, such
22 as letters, drawings and specifications, shall include all pertinent information, such as stamps, initials and signatures.
23 The licensee or registrant shall maintain adequate safeguards against tampering with and loss of records.
24 [20.3.4.450 NMAC - Rp, 20.3.4.450 NMAC, 4/30/2009]

25
26 **20.3.4.451 REPORTS OF STOLEN, LOST OR MISSING LICENSED OR REGISTERED SOURCES**
27 **OF RADIATION:**

28 **A. Telephone Reports.** Each licensee shall report to the department by telephone as follows:

29 (1) immediately after its occurrence becomes known to the licensee, stolen, lost or missing
30 licensed radioactive material in an aggregate quantity equal to or greater than 1,000 times the quantity specified in
31 20.3.4.462 NMAC under such circumstances that it appears to the licensee that an exposure could result to
32 individuals in unrestricted areas; or

33 (2) within 30 days after its occurrence becomes known to the licensee, lost, stolen or missing
34 licensed radioactive material in an aggregate quantity greater than 10 times the quantity 20.3.4.462 NMAC that is
35 still missing;

36 (3) each registrant shall report immediately after its occurrence becomes known to the
37 registrant, a stolen, lost or missing radiation machine.

38 **B. Written Reports.** Each licensee or registrant required to make a report pursuant to Subsection A
39 of this section shall, within 30 days after making the telephone report, make a written report to the department
40 setting forth the following information:

41 (1) a description of the licensed or registered source of radiation involved, including, for
42 radioactive material, the kind, quantity, and chemical and physical form; and, for radiation machines, the
43 manufacturer, model and serial number, type and maximum energy of radiation emitted;

44 (2) a description of the circumstances under which the loss or theft occurred;

45 (3) a statement of disposition, or probable disposition, of the licensed or registered source of
46 radiation involved;

47 (4) exposures of individuals to radiation, circumstances under which the exposures occurred,
48 and the possible total effective dose equivalent to persons in unrestricted areas;

49 (5) actions that have been taken, or will be taken, to recover the source of radiation; and

50 (6) procedures or measures that have been, or will be, adopted to ensure against a recurrence
51 of the loss or theft of licensed or registered sources of radiation.

52 **C.** Subsequent to filing the written report, the licensee or registrant shall also report additional
53 substantive information on the loss or theft within 30 days after the licensee or registrant learns of such information.

54 **D.** The licensee or registrant shall prepare any report filed with the department pursuant to this
55 section so that names of individuals who may have received exposure to radiation are stated in a separate and
56 detachable portion of the report.

[20.3.4.451 NMAC - Rp, 20.3.4.451 NMAC, 4/30/2009]

20.3.4.452 NOTIFICATION OF INCIDENTS:

A. Immediate Notification. Notwithstanding other requirements for notification, each licensee or registrant shall immediately report each event involving a source of radiation possessed by the licensee or registrant that may have caused or threatens to cause any of the following conditions:

- (1) an individual to receive:
 - (a) a total effective dose equivalent of 25 rems (0.25 sievert) or more; or
 - (b) a lens dose equivalent of 75 rems (0.75 sievert) or more; or
 - (c) a shallow dose equivalent to the skin or extremities or a total organ dose equivalent of 250 rads (2.5 grays) or more; or
- (2) the release of radioactive material, inside or outside of a restricted area, so that, had an individual been present for 24 hours, the individual could have received an intake five times the occupational ALI; this provision does not apply to locations where personnel are not normally stationed during routine operations, such as hot-cells or process enclosures.

B. Twenty-Four Hour Notification. Each licensee or registrant shall, within 24 hours of discovery of the event, report to the department each event involving loss of control of a licensed or registered source of radiation possessed by the licensee or registrant that may have caused, or threatens to cause, any of the following conditions:

- (1) an individual to receive, in a period of 24 hours:
 - (a) a total effective dose equivalent exceeding 5 rems (0.05 sievert); or
 - (b) a lens dose equivalent exceeding 15 rems (0.15 sievert); or
 - (c) a shallow dose equivalent to the skin or extremities or a total organ dose equivalent exceeding 50 rems (0.5 sievert); or
- (2) the release of radioactive material, inside or outside of a restricted area, so that, had an individual been present for 24 hours, the individual could have received an intake in excess of one occupational ALI; this provision does not apply to locations where personnel are not normally stationed during routine operations, such as hot-cells or process enclosures.

C. The licensee or registrant shall prepare each report filed with the department pursuant to this section so that names of individuals who have received exposure to sources of radiation are stated in a separate and detachable portion of the report.

D. Licensees and registrants shall make the reports required by Subsections A and B of this section to the department by telephone, and shall confirm the initial contact by e-mail, telegram, mailgram or facsimile to the department.

E. The provisions of this section do not apply to doses that result from planned special exposures, provided such doses are within the limits for planned special exposures and are reported pursuant to 20.3.4.454 NMAC.

[20.3.4.452 NMAC - Rp, 20.3.4.452 NMAC, 4/30/2009]

20.3.4.453 REPORTS OF EXPOSURES, RADIATION LEVELS AND CONCENTRATIONS OF RADIOACTIVE MATERIAL EXCEEDING THE CONSTRAINTS OR LIMITS:

A. Reportable Events. In addition to the notification required by 20.3.4.452 NMAC, each licensee or registrant shall submit a written report within 30 days after learning of any of the following occurrences:

- (1) incidents for which notification is required by 20.3.4.452 NMAC; or
- (2) doses in excess of any of the following:
 - (a) the occupational dose limits for adults in 20.3.4.405 NMAC;
 - (b) the occupational dose limits for a minor in 20.3.4.411 NMAC;
 - (c) the limits for an embryo/fetus of a declared pregnant woman in 20.3.4.412 NMAC;
 - (d) the limits for an individual member of the public in 20.3.4.413 NMAC;
 - (e) the limit in the license or registration; or
 - (f) the ALARA constraints for air emissions established under Subsection D of 20.3.4.404 NMAC; or
- (3) levels of radiation or concentrations of radioactive material in:
 - (a) a restricted area in excess of applicable limits in the license or registration; or

(b) an unrestricted area in excess of 10 times the applicable limit set forth in this part (20.3.4 NMAC) or in the license or registration, whether or not involving exposure of any individual in excess of the limits in 20.3.4.413 NMAC; or

(4) for licensees subject to the provisions of EPA generally applicable environmental radiation standards in 40 CFR 190, levels of radiation or releases of radioactive material in excess of those standards, or of license conditions related to those standards.

B. Content of Report.

(1) Each report required by Subsection A of this section shall describe the extent of exposure of individuals to radiation and radioactive material, including, as appropriate:

(a) estimates of each individual's dose;
(b) the levels of radiation and concentrations of radioactive material involved;
(c) the cause of the elevated exposures, dose rates or concentrations; and
(d) corrective steps taken or planned to ensure against a recurrence, including the schedule for achieving conformance with applicable limits, ALARA constraints, generally applicable environmental standards and associated license or registration conditions.

(2) Each report filed pursuant to Subsection A of this section shall include for each occupationally overexposed individual: the name, social security account number and date of birth. With respect to the limit for the embryo/fetus set forth in 20.3.4.412 NMAC, the identifiers should be those of the declared pregnant woman. The report shall be prepared so that this information is stated in a separate and detachable part of the report.

C. All licensees or registrants who make reports pursuant to Subsection A of this section shall submit the report in writing to the department.

[20.3.4.453 NMAC - Rp, 20.3.4.453 NMAC, 4/30/2009; A, XX/XX/2026]

20.3.4.454 REPORTS OF PLANNED SPECIAL EXPOSURES: The licensee or registrant shall submit a written report to the department within 30 days following any planned special exposure conducted in accordance with 20.3.4.410 NMAC, informing the department that a planned special exposure was conducted and indicating the date the planned special exposure occurred and the information required by 20.3.4.445 NMAC.

[20.3.4.454 NMAC - Rp, 20.3.4.454 NMAC, 4/30/2009]

20.3.4.455 REPORTS OF TRANSACTIONS INVOLVING NATIONALLY TRACKED SOURCES: The regulations of the U. S. Nuclear Regulatory Commission set forth in 10 CFR 20.2207 are hereby incorporated by reference.

[20.3.4.455 NMAC - N, 4/30/2009, 5/1/2024]

20.3.4.456 REPORTS OF INDIVIDUAL MONITORING:

A. This section applies to each person licensed or registered by the department to:

(1) possess or use sources of radiation for purposes of industrial radiography pursuant to 20.3.3 NMAC and 20.3.5 NMAC; or
(2) receive radioactive waste from other persons for disposal pursuant to 20.3.13 NMAC; or
(3) possess or use at any time, for processing or manufacturing for distribution pursuant to 20.3.3 NMAC or 20.3.7 NMAC, radioactive material in quantities exceeding any one of the following quantities:

TABLE 456.1		
Radionuclide	Activity ¹ Curies	Gigabecquerels
Cesium-137	1	37
Cobalt-60	1	37
Gold-198	100	3,700
Iodine-131	1	37
Iridium-192	10	370
Krypton-85	1,000	37,000
Promethium-147	10	370
Technetium-99m	1,000	37,000

Table 456.1 note: ¹the department may require as a license condition, or by rule, regulation or order pursuant to 20.3.1.111 NMAC, reports from licensees who are licensed to use radionuclides not on this list, in quantities sufficient to cause comparable radiation levels.

1 **B.** Each licensee or registrant in a category listed in Subsection A of this section shall submit an
2 annual report of the results of individual monitoring carried out by the licensee or registrant for each individual for
3 whom monitoring was required by 20.3.4.417 NMAC during that year. The licensee or registrant may include
4 additional data for individuals for whom monitoring was provided but not required. The licensee or registrant shall
5 use department form *occupational dose record for a monitoring period* or equivalent, or electronic media containing
6 all the information required by department form *occupational dose record for a monitoring period*.

7 **C.** The licensee or registrant shall file the report required by Subsection B of this section, covering
8 the preceding year, on or before April 30 of each year. The licensee or registrant shall submit the report to the
9 department.

10 [20.3.4.456 NMAC - Rp, 20.3.4.456 NMAC, 4/30/2009]

11
12 **20.3.4.457 NOTIFICATIONS AND REPORTS TO INDIVIDUALS OF EXCEEDING DOSE LIMITS:**

13 **A.** Requirements for notification and reports to individuals of exposure to radiation or radioactive
14 material are specified in 20.3.10.1003 NMAC.

15 **B.** When a licensee or registrant is required pursuant to the provisions of 20.3.4.453 NMAC or
16 20.3.4.454 NMAC to report to the department any exposure of an identified occupationally exposed individual, or
17 an identified member of the public, to radiation or radioactive material, the licensee or registrant shall also provide a
18 copy of the report submitted to the department to the individual. This report must be transmitted at a time not later
19 than the transmittal to the department, and shall comply with the provisions of 20.3.10.1003 NMAC.

20 [20.3.4.457 NMAC - Rp, 20.3.4.457 NMAC, 4/30/2009; A, 6/30/2011]

21
22 **20.3.4.458 REPORTS OF LEAKING OR CONTAMINATED SEALED SOURCES:** The licensee shall
23 file a report within 5 days with the department if the test for leakage or contamination required pursuant to
24 20.3.4.415 NMAC indicates a sealed source is leaking or contaminated. The report shall include the equipment
25 involved, the test results and the corrective action taken.

26 [20.3.4.458 NMAC - Rp, 20.3.4.458 NMAC, 4/30/2009]

27
28 **20.3.4.459 VACATING PREMISES:** Each specific licensee shall, no less than 30 days before vacating or
29 relinquishing possession or control of premises which may have been contaminated with radioactive material as a
30 result of his activities, notify the department in writing of intent to vacate. When deemed necessary by the
31 department, the licensee shall decontaminate the premises in such a manner as the department may specify.

32 [20.3.4.459 NMAC - Rp, 20.3.4.459 NMAC, 4/30/2009]

33
34 **20.3.4.460 APPENDIX A - PROTECTION FACTORS FOR RESPIRATORS:** The assigned protection
35 factors specified in this section apply only in a respiratory protection program that meets the requirements of this
36 part. They are applicable only to airborne radiological hazards and may not be appropriate to circumstances when
37 chemical or other respiratory hazards exist instead of, or in addition to, radioactive hazards. Selection and use of
38 respirators for such circumstances shall also comply with department of labor regulations. Radioactive
39 contaminants for which the concentration values in column 3 of table I of 20.3.4.461 NMAC are based on internal
40 dose due to inhalation may, in addition, present external exposure hazards at higher concentrations. Under these
41 circumstances, limitations on occupancy may have to be governed by external dose limits.

42 **A. Air Purifying Respirators.**

Configuration (air purifying respirators only)	Operating Mode	Assigned Protection Factors
Filtering facepiece disposable. (Refer to Paragraph (4) of this subsection.)	Negative Pressure	(Refer to Paragraph (4) of this subsection.)
Facepiece, half (Refer to paragraph (5) of this subsection.)	Negative Pressure	10
Facepiece, full	Negative Pressure	100

Configuration (air purifying respirators only)	Operating Mode	Assigned Protection Factors
Facepiece, half	Power air-purifying respirators	50
Facepiece, full	Power air-purifying respirators	1000
Helmet/hood	Power air-purifying respirators	1000
Facepiece, loose-fitting	Power air-purifying respirators	25

(1) The assigned protection factors apply for protection against particulate only.

(2) Air purifying respirators with $APF < 100$ shall be equipped with particulate filters that are at least 95 percent efficient. Air purifying respirators with $APF = 100$ shall be equipped with particulate filters that are at least 99 percent efficient. Air purifying respirators with $APFs > 100$ shall be equipped with particulate filters that are at least 99.97 percent efficient.

(3) The licensee may apply to the department for the use of an APF greater than 1 for sorbent cartridges as protection against airborne radioactive gases and vapors (e.g., radioiodine).

(4) Special requirements and indications for filtering facepiece disposable respirators.

Licensees may permit individuals to use this type of respirator who have not been medically screened or fit tested on the device provided that no credit is taken for their use in estimating intake or dose. It is also recognized that it is difficult to perform an effective positive or negative pressure pre-use user seal check on this type of device. All other respiratory protection program requirements listed in 20.3.4.423 NMAC apply. An assigned protection factor has not been assigned for these devices. However, an APF equal to 10 may be used if the licensee can demonstrate a fit factor of at least 100 by use of a validated or evaluated, qualitative or quantitative fit test.

(5) Special requirements and indications for half facepiece, negative pressure respirators. The requirements in this paragraph apply to the under-chin configuration only. No distinction is made in this section between elastomeric half-masks with replaceable cartridges and those designed with the filter medium as an integral part of the facepiece (e.g., disposable or reusable disposable). Both types are acceptable so long as the seal area of the latter contains some substantial type of seal-enhancing material such as rubber or plastic, the two or more suspension straps are adjustable, the filter medium is at least 95 percent efficient and all other requirements of this part are met.

B. Air-Line Respirators (Atmosphere Supplying).

Configuration (air-line respirators only)	Operating Mode	Assigned Protection Factors
Facepiece, half	Demand	10
Facepiece, half	Continuous Flow	50
Facepiece, half	Pressure Demand	50
Facepiece, full	Demand	100
Facepiece, full	Continuous Flow	1000
Facepiece, full	Pressure Demand	1000
Helmet/hood	Continuous	1000
Facepiece, loose-fitting	Continuous	25

Configuration (air-line respirators only)	Operating Mode	Assigned Protection Factors
Suit	Continuous	(Refer to Paragraph (3) of this subsection.)

(1) The assigned protection factors apply for protection against particulate, gases and vapors.

(2) The assigned protection factors for gases and vapors are not applicable to radioactive contaminants that present an absorption or submersion hazard. For tritium oxide vapor, approximately one-third of the intake occurs by absorption through the skin so that an overall protection factor of 3 is appropriate when atmosphere-supplying respirators are used to protect against tritium oxide. Exposure to radioactive noble gases is not considered a significant respiratory hazard, and protective actions for these contaminants should be based on external (submersion) dose considerations.

(3) **Special requirements and indications for suits.** No national institute for occupational safety and health (NIOSH) approval schedule is currently available for atmosphere supplying suits. This equipment may be used in an acceptable respiratory protection program as long as all the other minimum program requirements, with the exception of fit testing, are met (see 20.3.4.423 NMAC).

C. Self-Contained Breathing Apparatus "SCBA" (Atmosphere Supplying).

Configuration (SCBA respirators only)	Operating Mode	Assigned Protection Factors
Facepiece, full	Demand	100 (Refer to Paragraph (3) of this subsection.)
Facepiece, full	Pressure Demand	10,000 (Refer to Paragraph (4) of this subsection.)
Facepiece, full	Demand-Recirculating	100 (Refer to Paragraph (3) of this subsection.)
Facepiece, full	Positive Pressure Recirculating	10,000 (Refer to Paragraph (4) of this subsection.)

(1) The assigned protection factors apply for protection against particulate, gases and vapors.

(2) The assigned protection factors for gases and vapors are not applicable to radioactive contaminants that present an absorption or submersion hazard. For tritium oxide vapor, approximately one-third of the intake occurs by absorption through the skin so that an overall protection factor of 3 is appropriate when atmosphere-supplying respirators are used to protect against tritium oxide. Exposure to radioactive noble gases is not considered a significant respiratory hazard, and protective actions for these contaminants should be based on external (submersion) dose considerations.

(3) **Special requirements and indications for demand and demand-recirculating self-contained breathing apparatus (SCBA).** The licensee should implement institutional controls to assure that these devices are not used in areas immediately dangerous to life or health (IDLH).

(4) **Special requirements and indications for pressure demand and positive pressure recirculating self-contained breathing apparatus (SCBA).** This type of respirator may be used as an emergency device in unknown concentrations for protection against inhalation hazards. External radiation hazards and other limitations to permitted exposure such as skin absorption shall be taken into account in these circumstances. This device may not be used by any individual who experiences perceptible outward leakage of breathing gas while wearing the device.

D. Combination Respirators.

Configuration (combination respirators only)	Operating Mode and Assigned Protection Factors
Any combination of air-purifying and atmosphere-supplying respirators	Assigned protection factor for type and mode of operation as listed above.

[20.3.4.460 NMAC - Rp, 20.3.4.460 NMAC, 4/30/2009]

20.3.4.461 APPENDIX B - ANNUAL LIMITS ON INTAKE (ALI) AND DERIVED AIR CONCENTRATIONS (DAC) OF RADIONUCLIDES FOR OCCUPATIONAL EXPOSURE; EFFLUENT CONCENTRATIONS; CONCENTRATIONS FOR RELEASE TO SANITARY SEWERAGE:

A. Introduction. For each radionuclide, table I of this section indicates the chemical form which is to be used for selecting the appropriate ALI or DAC value. The ALIs and DACs for inhalation are given for an aerosol with an activity median aerodynamic diameter (AMAD) of 1 micrometer, and for three classes (D,W and Y) of radioactive material, which refer to their retention (approximately days, weeks or years) in the pulmonary region of the lung. This classification applies to a range of clearance half-times for D if less than 10 days, for W from 10 to 100 days and for Y greater than 100 days. The class (D,W or Y) given in the column headed "Class" applies only to the inhalation ALIs and DACs given in columns 2 and 3 of table I of this section. Table II of this section provides concentration limits for airborne and liquid effluents released to the general environment. Table III of this section provides concentration limits for discharges to sanitary sewerage.

B. Note. The values in tables I, II and III of this section are presented in the E-notation. In this notation a value of 6E-02 represents a value of 6×10^{-2} or 0.06, 6E+2 represents 6×10^2 or 600, and 6E+0 represents 6×10^0 or 6.

C. Table I "Occupational Values".

(1) Note that the columns in table I of this section titled "Oral Ingestion ALI," "Inhalation ALI" and "DAC," are applicable to occupational exposure to radioactive material.

(2) The ALI's in this section are the annual intakes of given radionuclide by "reference man" which would result in either a committed effective dose equivalent of 5 rems (0.05 sievert) (stochastic ALI), or a committed dose equivalent of 50 rems (0.5 sievert) to an organ or tissue (non-stochastic ALI). The stochastic ALIs were derived to result in a risk, due to irradiation of organs and tissues, comparable to the risk associated with deep dose equivalent to the whole body of 5 rems (0.05 sievert). The derivation includes multiplying the committed dose equivalent to an organ or tissue by a weighting factor, w_T . This weighting factor is the proportion of the risk of stochastic effects resulting from irradiation of the organ or tissue, T, to the total risk of stochastic effects when the whole body is irradiated uniformly. The values of w_T are listed under the definition of weighting factor in 20.3.4.7 NMAC. The non-stochastic ALI's were derived to avoid non-stochastic effects, such as prompt damage to tissue or reduction in organ function.

(3) A value of $w_T = 0.06$ is applicable to each of the five organs or tissues in the "remainder" category receiving the highest dose equivalents, and the dose equivalents of all other remaining tissues may be disregarded. The following portions of the gastro-intestinal (GI) tract - stomach, small intestine, upper large intestine and lower large intestine - are to be treated as four separate organs.

(4) Note that the dose equivalents for an extremity, skin and lens of the eye are not considered in computing the committed effective dose equivalent, but are subject to limits that must be met separately.

(5) When an ALI is defined by the stochastic dose limit, this value alone is given. When an ALI is determined by the non-stochastic dose limit to an organ, the organ or tissue to which the limit applies is shown, and the ALI for the stochastic limit is shown in parentheses. Abbreviated organ or tissue designations are used:

- (a) LLI wall = lower large intestine wall;
- (b) St wall = stomach wall;
- (c) Blad wall = bladder wall; and
- (d) Bone surf = bone surface.

(6) The use of the ALI's listed first, the more limiting of the stochastic and non-stochastic ALI's, will ensure that non-stochastic effects are avoided and that the risk of stochastic effects is limited to an acceptably low value. If, in a particular situation involving a radionuclide for which the non-stochastic ALI is limiting, use of that non-stochastic ALI is considered unduly conservative, the licensee may use the stochastic ALI to determine the committed effective dose equivalent. However, the licensee shall also ensure that the 50 rems (0.5 sievert) dose equivalent limit for any organ or tissue is not exceeded by the sum of the external deep dose equivalent plus the internal committed dose equivalent to that organ, not the effective dose. For the case where there is no external dose contribution, this would be demonstrated if the sum of the fractions of the non-stochastic ALI's (ALI_{ns}) that contribute to the committed dose equivalent to the organ receiving the highest dose does not exceed unity, that is, the sum (intake in microcuries of each radionuclide/ ALI_{ns}) is less than or equal to 1.0. If there is an external deep dose equivalent contribution of H_d , then this sum must be less than $1 - (H_d/50)$, instead of less than or equal to 1.0. Note that the dose equivalents for an extremity, skin and lens of the eye are not considered in computing the committed effective dose equivalent, but are subject to limits that must be met separately.

(7) The derived air concentration (DAC) values are derived limits intended to control chronic occupational exposures. The relationship between the DAC and the ALI is given by:

DAC = ALI (in microcuries) / (2000 hours per working year x 60 minutes/hour x 20000 milliliter per minute) = (ALI / 2.4×10^9 ml) microcuries/milliliter, where 20000 milliliter is the volume of air breathed per minute at work by reference man under working conditions of light work.

(8) The DAC values relate to one of two modes of exposure: either external submersion or the internal committed dose equivalents resulting from inhalation of radioactive materials. DACs based upon submersion are for immersion in a semi-infinite cloud of uniform concentration and apply to each radionuclide separately.

(9) The ALI and DAC values include contributions to exposure by the single radionuclide named and any in-growth of daughter radionuclides produced in the body by decay of the parent. However, intakes that include both the parent and daughter radionuclides should be treated by the general method appropriate for mixtures.

(10) The values of ALI and DAC do not apply directly when the individual both ingests and inhales a radionuclide, when the individual is exposed to a mixture of radionuclides by either inhalation or ingestion or both, or when the individual is exposed to both internal and external irradiation (see 20.3.4.406 NMAC). When an individual is exposed to radioactive materials which fall under several of the translocation classifications of the same radionuclide, such as class D, class W or class Y, the exposure may be evaluated as if it were a mixture of different radionuclides.

(11) It should be noted that the classification of a compound as class D, W or Y is based on the chemical form of the compound and does not take into account the radiological half-life of different radionuclides. For this reason, values are given for class D, W and Y compounds, even for very short-lived radionuclides.

D. Table II "Effluent Concentrations".

(1) The columns in table II of this section titled "effluents," "air" and "water" are applicable to the assessment and control of dose to the public, particularly in the implementation of the provisions of 20.3.4.414 NMAC. The concentration values given in columns 1 and 2 of table II are equivalent to the radionuclide concentrations which, if inhaled or ingested continuously over the course of a year, would produce a total effective dose equivalent of 0.05 rem (0.5 millisievert).

(2) Consideration of non-stochastic limits has not been included in deriving the air and water effluent concentration limits because non-stochastic effects are presumed not to occur at or below the dose levels established for individual members of the public. For radionuclides, where the non-stochastic limit was governing in deriving the occupational DAC, the stochastic ALI was used in deriving the corresponding airborne effluent limit in table II of this subsection. For this reason, the DAC and airborne effluent limits are not always proportional as was the case in appendix A of part D of the eighth edition of volume I of the *suggested state regulations for control of radiation*.

(3) The air concentration values listed in column 1 of table II of this subsection were derived by one of two methods. For those radionuclides for which the stochastic limit is governing, the occupational stochastic inhalation ALI was divided by 2.4×10^9 milliliter, relating the inhalation ALI to the DAC, as explained above, and then divided by a factor of 300. The factor of 300 includes the following components: a factor of 50 to relate the 5 rems (0.05 sievert) annual occupational dose limit to the 0.1 rem (1 millisievert) limit for members of the public, a factor of 3 to adjust for the difference in exposure time and the inhalation rate for a worker and that for members of the public; and a factor of 2 to adjust the occupational values, derived for adults, so that they are applicable to other age groups.

(4) For those radionuclides for which submersion, that is external dose, is limiting, the occupational DAC in column 3 of table I was divided by 219. The factor of 219 is composed of a factor of 50, as described above, and a factor of 4.38 relating occupational exposure for 2,000 hours per year to full-time exposure (8,760 hours per year). Note that an additional factor of 2 for age considerations is not warranted in the submersion case.

(5) The water concentrations were derived by taking the most restrictive occupational stochastic oral ingestion ALI and dividing by 7.3×10^7 . The factor of 7.3×10^7 milliliter includes the following components: the factors of 50 and 2 described above and a factor of 7.3×10^5 milliliter which is the annual water intake of reference man.

(6) Note 2 of Subsection F of this section provides groupings of radionuclides which are applicable to unknown mixtures of radionuclides. These groupings, including occupational inhalation ALIs and DACs, air and water effluent concentrations and releases to sewer, require demonstrating that the most limiting radionuclides in successive classes are absent. The limit for the unknown mixture is defined when the presence of

one of the listed radionuclides cannot be definitely excluded as being present either from knowledge of the radionuclide composition of the source or from actual measurements.

E. Table III "Releases to Sewers". The monthly average concentrations for release to sanitary sewerage are applicable to the provisions in 20.3.4.435 NMAC. The concentration values were derived by taking the most restrictive occupational stochastic oral ingestion ALI and dividing by 7.3×10^6 milliliter. The factor of 7.3×10^6 milliliter is composed of a factor of 7.3×10^5 milliliter, the annual water intake by reference man, and a factor of 10, such that the concentrations, if the sewage released by the licensee were the only source of water ingested by reference man during a year, would result in a committed effective dose equivalent of 0.05 rem (5 millisieverts).

List of Elements and their Corresponding Atomic Numbers		
Element	Atomic Symbol	Atomic Number
Actinium	Ac	89
Aluminum	Al	13
Americium	Am	95
Antimony	Sb	51
Argon	Ar	18
Arsenic	As	33
Astatine	At	85
Barium	Ba	56
Berkelium	Bk	97
Beryllium	Be	4
Bismuth	Bi	83
Bromine	Br	35
Cadmium	Cd	48
Calcium	Ca	20
Californium	Cf	98
Carbon	C	6
Cerium	Ce	58
Cesium	Cs	55
Chlorine	Cl	17
Chromium	Cr	24
Cobalt	Co	27
Copper	Cu	29
Curium	Cm	96
Dysprosium	Dy	66
Einsteinium	Es	99
Erbium	Er	68
Europium	Eu	63
Fermium	Fm	100
Fluorine	F	9
Francium	Fr	87
Gadolinium	Gd	64
Gallium	Ga	31
Germanium	Ge	32
Gold	Au	79
Hafnium	Hf	72
Holmium	Ho	67
Hydrogen	H	1
Indium	In	49
Iodine	I	53

List of Elements and their Corresponding Atomic Numbers		
Element	Atomic Symbol	Atomic Number
Iridium	Ir	77
Iron	Fe	26
Krypton	Kr	36
Lanthanum	La	57
Lead	Pb	82
Lutetium	Lu	71
Magnesium	Mg	12
Manganese	Mn	25
Mendelevium	Md	101
Mercury	Hg	80
Molybdenum	Mo	42
Neodymium	Nd	60
Neptunium	Np	93
Nickel	Ni	28
Niobium	Nb	41
Nitrogen	N	7
Osmium	Os	76
Oxygen	O	8
Palladium	Pd	46
Phosphorus	P	15
Platinum	Pt	78
Plutonium	Pu	94
Polonium	Po	84
Potassium	K	19
Praseodymium	Pr	59
Promethium	Pm	61
Protactinium	Pa	91
Radium	Ra	88
Radon	Rn	86
Rhenium	Re	75
Rhodium	Rh	45
Rubidium	Rb	37
Ruthenium	Ru	44
Samarium	Sm	62
Scandium	Sc	21
Selenium	Se	34
Silicon	Si	14
Silver	Ag	47
Sodium	Na	11
Strontium	Sr	38
Sulfur	S	16
Tantalum	Ta	73
Technetium	Tc	43
Tellurium	Te	52
Terbium	Tb	65
Thallium	Tl	81

List of Elements and their Corresponding Atomic Numbers		
Element	Atomic Symbol	Atomic Number
Thorium	Th	90
Thulium	Tm	69
Tin	Sn	50
Titanium	Ti	22
Tungsten	W	74
Uranium	U	92
Vanadium	V	23
Xenon	Xe	54
Ytterbium	Yb	70
Yttrium	Y	39
Zinc	Zn	30
Zirconium	Zr	40

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Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/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 ¹ : 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, oxides, halides, and nitrates	4E+4	2E+4	9E-6	3E-8	6E-4	6E-3
			-	2E+4	8E-6	3E-8	-	-
4	Beryllium-10	W, see ⁷ Be	1E+3 LLI wall (1E+3)	2E+2	6E-8	2E-10	-	-
			-	-	-	-	2E-5	2E-4
		Y, see ⁷ Be	-	1E+1	6E-9	2E-11	-	-
6	Carbon-11 ²	Monoxide Dioxide Compounds	- - 4E+5	1E+6 6E+5 4E+5	5E-4 3E-4 2E-4	2E-6 9E-7 6E-7	- - 6E-3	- - 6E-2
6	Carbon-14	Monoxide Dioxide Compounds	- - 2E+3	2E+6 2E+5 2E+3	7E-4 9E-5 1E-6	2E-6 3E-7 3E-9	- - 3E-5	- - 3E-4
7	Nitrogen-13 ²	Submersion ¹	-	-	4E-6	2E-8	-	-
8	Oxygen-15 ²	Submersion ¹	-	-	4E-6	2E-8	-	-
9	Fluorine-18 ²	D, fluorides of H, Li, Na, K, Rb, Cs, and Fr	5E+4 St wall (5E+4)	7E+4	3E-5	1E-7	-	-
			-	-	-	-	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 8E+4	4E-5 3E-5	1E-7 1E-7	- -	- -
		Y, lanthanum fluoride	-	-	-	-	-	-
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

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
12	Magnesium-28	D, all compounds except those given for W, oxides, hydroxides, carbides, halides, and nitrates	7E+2 -	2E+3 1E+3	7E-7 5E-7	2E-9 2E-9	9E-6 -	9E-5 -
13	Aluminum-26	D, all compounds except those given for W, oxides, hydroxides, carbides, halides and nitrates	4E+2 -	6E+1 9E+1	3E-8 4E-8	9E-11 1E-10	6E-6 -	6E-5 -
14	Silicon-31	D, all compounds except those given for W and Y, oxides, hydroxides, carbides, and nitrates Y, aluminosilicate glass	9E+3 - -	3E+4 3E+4 3E+4	1E-5 1E-5 1E-5	4E-8 5E-8 4E-8	1E-4 - -	1E-3 - -
14	Silicon-32	D, see ³¹ Si W, see ³¹ Si Y, see ³¹ Si	2E+3 LLI wall (3E+3) -	2E+2 - 1E+2 5E+0	1E-7 - 5E-8 2E-9	3E-10 - 2E-10 7E-12	- 4E-5 - -	- 4E-4 - -
15	Phosphorus-32	D, all compounds except phosphates given for W, phosphates of Zn ²⁺ , S ³⁺ , Mg ²⁺ , Fe ³⁺ , Bi ³⁺ , and Lanthanides	6E+2 -	9E+2 4E+2	4E-7 2E-7	1E-9 5E-10	9E-6 -	9E-5 -
15	Phosphorus-33	D, see ³² P W, see ³² P	6E+3 -	8E+3 3E+3	4E-6 1E-6	1E-8 4E-9	8E-5 -	8E-4 -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
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 LLI wall (8E+3) 6E+3 -	1E+4 2E+4 - - 2E+3	6E-6 7E-6 - - 9E-7	2E-8 2E-8 - - 3E-9	- - 1E-4 - -	- - 1E-3 - -
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 2E+2	1E-6 1E-7	3E-9 3E-10	2E-5 -	2E-4 -
17	Chlorine-38 ²	D, see ³⁶ Cl W, see ³⁶ Cl	2E+4 St wall (3E+4) -	4E+4 - 5E+4	2E-5 - 2E-5	6E-8 - 6E-8	- 3E-4 -	- 3E-3 -
17	Chlorine-39 ²	D, see ³⁶ Cl W, see ³⁶ Cl	2E+4 St wall (4E+4) -	5E+4 - 6E+4	2E-5 - 2E-5	7E-8 - 8E-8	- 5E-4 -	- 5E-3 -
18	Argon-37	Submersion ¹	-	-	1E+0	6E-3	-	-
18	Argon-39	Submersion ¹	-	-	2E-4	8E-7	-	-
18	Argon-41	Submersion ¹	-	-	3E-6	1E-8	-	-
19	Potassium-40	D, all compounds	3E+2	4E+2	2E-7	6E-10	4E-6	4E-5

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
19	Potassium-42	D, all compounds	5E+3	5E+3	2E-6	7E-9	6E-5	6E-4
19	Potassium-43	D, all compounds	6E+3	9E+3	4E-6	1E-8	9E-5	9E-4
19	Potassium-44 ²	D, all compounds	2E+4 St wall (4E+4)	7E+4 -	3E-5 -	9E-8 -	- 5E-4	- 5E-3
19	Potassium-45 ²	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
21	Scandium-49 ²	Y, all compounds	2E+4	5E+4	2E-5	8E-8	3E-4	3E-3
22	Titanium-44	D, all compounds except those given for W and Y W, oxides, hydroxides, carbides, halides, and nitrates Y, SrTiO	3E+2 -	1E+1 3E+1 6E+0	5E-9 1E-8 2E-9	2E-11 4E-11 8E-12	4E-6 - -	4E-5 - -
22	Titanium-45	D, see ⁴⁴ Ti W, see ⁴⁴ Ti Y, see ⁴⁴ Ti	9E+3 - -	3E+4 4E+4 3E+4	1E-5 1E-5 1E-5	3E-8 5E-8 4E-8	1E-4 - -	1E-3 - -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
23	Vanadium-47 ²	D, all compounds except those given for W W, oxides, hydroxides, carbides, and halides	3E+4 St wall (3E+4) -	8E+4 - 1E+5	3E-5 - 4E-5	1E-7 - 1E-7	- 4E-4 -	- 4E-3 -
23	Vanadium-48	D, see ⁴⁷ V W, see ⁴⁷ V	6E+2 -	1E+3 6E+2	5E-7 3E-7	2E-9 9E-10	9E-6 -	9E-5 -
23	Vanadium-49	D, see ⁴⁷ V W, see ⁴⁷ V	7E+4 LLI wall (9E+4) -	3E+4 Bone surf (3E+4) 2E+4	1E-5 - 8E-6	- 5E-8 2E-8	- 1E-3 -	- 1E-2 -
24	Chromium-48	D, all compounds except those given for W and Y W, halides and nitrates Y, oxides and hydroxides	6E+3 - -	1E+4 7E+3 7E+3	5E-6 3E-6 3E-6	2E-8 1E-8 1E-8	8E-5 - -	8E-4 - -
24	Chromium-49 ²	D, see ⁴⁸ Cr W, see ⁴⁸ Cr Y, see ⁴⁸ Cr	3E+4 - -	8E+4 1E+5 9E+4	4E-5 4E-5 4E-5	1E-7 1E-7 1E-7	4E-4 - -	4E-3 - -
24	Chromium-51	D, see ⁴⁸ Cr W, see ⁴⁸ Cr Y, see ⁴⁸ Cr	4E+4 - -	5E+4 2E+4 2E+4	2E-5 1E-5 8E-6	6E-8 3E-8 3E-8	5E-4 - -	5E-3 - -
25	Manganese-51 ²	D, all compounds except those given for W W, oxides, hydroxides, halides, and nitrates	2E+4 -	5E+4 6E+4	2E-5 3E-5	7E-8 8E-8	3E-4 -	3E-3 -
25	Manganese-52m ²	D, see ⁵¹ Mn W, see ⁵¹ Mn	3E+4 St Wall (4E+4) -	9E+4 - 1E+5	4E-5 - 4E-5	1E-7 - 1E-7	- 5E-4 -	- 5E-3 -
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 -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
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 ²	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 -
27	Cobalt-60	W, see ⁵⁵ Co Y, see ⁵⁵ Co	5E+2 2E+2	2E+2 3E+1	7E-8 1E-8	2E-10 5E-11	3E-6 -	3E-5 -
27	Cobalt-61 ²	W, see ⁵⁵ Co Y, see ⁵⁵ Co	2E+4 2E+4	6E+4 6E+4	3E-5 2E-5	9E-8 8E-8	3E-4 -	3E-3 -
27	Cobalt-62m ²	W, see ⁵⁵ Co Y, see ⁵⁵ Co	4E+4 St wall (5E+4) -	2E+5 - 2E+5	7E-5 - 6E-5	2E-7 - 2E-7	- 7E-4 -	- 7E-3 -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air ($\mu\text{Ci}/\text{ml}$)	Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				ALI (μCi)	DAC ($\mu\text{Ci}/\text{ml}$)			
28	Nickel-56	D, all compounds except those given for W, oxides, hydroxides, and carbides Vapor	1E+3 - -	2E+3 1E+3 1E+3	8E-7 5E-7 5E-7	3E-9 2E-9 2E-9	2E-5 - -	2E-4 - -
28	Nickel-57	D, see ^{56}Ni W, see ^{56}Ni Vapor	2E+3 - -	5E+3 3E+3 6E+3	2E-6 1E-6 3E-6	7E-9 4E-9 9E-9	2E-5 - -	2E-4 - -
28	Nickel-59	D, see ^{56}Ni W, see ^{56}Ni Vapor	2E+4 - -	4E+3 7E+3 2E+3	2E-6 3E-6 8E-7	5E-9 1E-8 3E-9	3E-4 - -	3E-3 - -
28	Nickel-63	D, see ^{56}Ni W, see ^{56}Ni Vapor	9E+3 - -	2E+3 3E+3 8E+2	7E-7 1E-6 3E-7	2E-9 4E-9 1E-9	1E-4 - -	1E-3 - -
28	Nickel-65	D, see ^{56}Ni W, see ^{56}Ni Vapor	8E+3 - -	2E+4 3E+4 2E+4	1E-5 1E-5 7E-6	3E-8 4E-8 2E-8	1E-4 - -	1E-3 - -
28	Nickel-66	D, see ^{56}Ni W, see ^{56}Ni Vapor	4E+2 LLI Wall (5E+2) - -	2E+3 - 6E+2 3E+3	7E-7 - 3E-7 1E-6	2E-9 - 9E-10 4E-9	- 6E-6 - -	- 6E-5 - -
29	Copper-60 ²	D, all compounds except those given for W and Y W, sulfides, halides, and nitrates Y, oxides and hydroxides	3E+4 St wall (3E+4) - -	9E+4 - 1E+5 1E+5	4E-5 - 5E-5 4E-5	1E-7 - 2E-7 1E-7	- 4E-4 - -	- 4E-3 - -
29	Copper-61	D, see ^{60}Cu W, see ^{60}Cu Y, see ^{60}Cu	1E+4 - -	3E+4 4E+4 4E+4	1E-5 2E-5 1E-5	4E-8 6E-8 5E-8	2E-4 - -	2E-3 - -
29	Copper-64	D, see ^{60}Cu W, see ^{60}Cu Y, see ^{60}Cu	1E+4 - -	3E+4 2E+4 2E+4	1E-5 1E-5 9E-6	4E-8 3E-8 3E-8	2E-4 - -	2E-3 - -
29	Copper-67	D, see ^{60}Cu W, see ^{60}Cu Y, see ^{60}Cu	5E+3 - -	8E+3 5E+3 5E+3	3E-6 2E-6 2E-6	1E-8 7E-9 6E-9	6E-5 - -	6E-4 - -
30	Zinc-62	Y, all compounds	1E+3	3E+3	1E-6	4E-9	2E-5	2E-4
30	Zinc-63 ²	Y, all compounds	2E+4 St wall (3E+4)	7E+4 - -	3E-5 - -	9E-8 - -	- 3E-4 -	- 3E-3 -
30	Zinc-65	Y, all compounds	4E+2	3E+2	1E-7	4E-10	5E-6	5E-5

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
30	Zinc-69m	Y, all compounds	4E+3	7E+3	3E-6	1E-8	6E-5	6E-4
30	Zinc-69 ²	Y, all compounds	6E+4	1E+5	6E-5	2E-7	8E-4	8E-3
30	Zinc-71m	Y, all compounds	6E+3	2E+4	7E-6	2E-8	8E-5	8E-4
30	Zinc-72	Y, all compounds	1E+3	1E+3	5E-7	2E-9	1E-5	1E-4
31	Gallium-65 ²	D, all compounds except those given for W	5E+4 St wall (6E+4)	2E+5 -	7E-5 -	2E-7 -	- 9E-4	- 9E-3
		W, oxides, hydroxides, carbides, halides, and nitrates	-	2E+5	8E-5	3E-7	-	-
31	Gallium-66	D, see ⁶⁵ Ga W, see ⁶⁵ Ga	1E+3 -	4E+3 3E+3	1E-6 1E-6	5E-9 4E-9	1E-5 -	1E-4 -
31	Gallium-67	D, see ⁶⁵ Ga W, see ⁶⁵ Ga	7E+3 -	1E+4 1E+4	6E-6 4E-6	2E-8 1E-8	1E-4 -	1E-3 -
31	Gallium-68 ²	D, see ⁶⁵ Ga W, see ⁶⁵ Ga	2E+4 -	4E+4 5E+4	2E-5 2E-5	6E-8 7E-8	2E-4 -	2E-3 -
31	Gallium-70 ²	D, see ⁶⁵ Ga	5E+4 St wall (7E+4)	2E-5 -	7E-5 -	2E-7 -	- 1E-3	- 1E-2
		W, see ⁶⁵ Ga	-	2E+5	8E-5	3E-7	-	-
31	Gallium-72	D, see ⁶⁵ Ga W, see ⁶⁵ Ga	1E+3 -	4E+3 3E+3	1E-6 1E-6	5E-9 4E-9	2E-5 -	2E-4 -
31	Gallium-73	D, see ⁶⁵ Ga W, see ⁶⁵ Ga	5E+3 -	2E+4 2E+4	6E-6 6E-6	2E-8 2E-8	7E-5 -	7E-4 -
32	Germanium-66	D, all compounds except those given for W, oxides, sulfides and halides	2E+4 -	3E+4 2E+4	1E-5 8E-6	4E-8 3E-8	3E-4 -	3E-3 -
		D, see ⁶⁶ Ge W, see ⁶⁶ Ge	3E+4 St wall (4E+4) -	9E+4 - 1E+5	4E-5 - 4E-5	1E-7 - 1E-7	- 6E-4 -	- 6E-3 -
32	Germanium-68	D, see ⁶⁶ Ge W, see ⁶⁶ Ge	5E+3 -	4E+3 1E+2	2E-6 4E-8	5E-9 1E-10	6E-5 -	6E-4 -
32	Germanium-69	D, see ⁶⁶ Ge W, see ⁶⁶ Ge	1E+4 -	2E+4 8E+3	6E-6 3E-6	2E-8 1E-8	2E-4 -	2E-3 -
32	Germanium-71	D, see ⁶⁶ Ge W, see ⁶⁶ Ge	5E+5 -	4E+5 4E+4	2E-4 2E-5	6E-7 6E-8	7E-3 -	7E-2 -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation ALI (μCi) DAC (μCi/ml)		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
32	Germanium-75 ²	D, see ⁶⁶ Ge W, see ⁶⁶ Ge	4E+4 St wall (7E+4) -	8E+4 - 8E+4	3E-5 - 4E-5	1E-7 - 1E-7	- 9E-4 -	- 9E-3 -
32	Germanium-77	D, see ⁶⁶ Ge W, see ⁶⁶ Ge	9E+3 -	1E+4 6E+3	4E-6 2E-6	1E-8 8E-9	1E-4 -	1E-3 -
32	Germanium-78 ²	D, see ⁶⁶ Ge W, see ⁶⁶ Ge	2E+4 St wall (2E+4) -	2E+4 - 2E+4	9E-6 - 9E-6	3E-8 - 3E-8	- 3E-4 -	- 3E-3 -
33	Arsenic-69 ²	W, all compounds	3E+4 St wall (4E+4) -	1E+5 -	5E-5 -	2E-7 -	- 6E-4	- 6E-3
33	Arsenic-70 ²	W, all compounds	1E+4	5E+4	2E-5	7E-8	2E-4	2E-3
33	Arsenic-71	W, all compounds	4E+3	5E+3	2E-6	6E-9	5E-5	5E-4
33	Arsenic-72	W, all compounds	9E+2	1E+3	6E-7	2E-9	1E-5	1E-4
33	Arsenic-73	W, all compounds	8E+3	2E+3	7E-7	2E-9	1E-4	1E-3
33	Arsenic-74	W, all compounds	1E+3	8E+2	3E-7	1E-9	2E-5	2E-4
33	Arsenic-76	W, all compounds	1E+3	1E+3	6E-7	2E-9	1E-5	1E-4
33	Arsenic-77	W, all compounds	4E+3 LLI wall (5E+3) -	5E+3 -	2E-6 -	7E-9 -	- 6E-5	- 6E-4
33	Arsenic-78 ²	W, all compounds	8E+3	2E+4	9E-6	3E-8	1E-4	1E-3
34	Selenium-70 ²	D, all compounds except those given for W W, oxides, hydroxides, carbides and elemental Se	2E+4 1E+4	4E+4 4E+4	2E-5 2E-5	5E-8 6E-8	1E-4 -	1E-3 -
34	Selenium-73m ²	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 ²	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 -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
34	Selenium-81 ²	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 ²	D, see ⁷⁰ Se	4E+4	1E+5	5E-5	2E-7	4E-4	4E-3
		W, see ⁷⁰ Se	3E+4	1E+5	5E-5	2E-7	-	-
35	Bromine-74m ²	D, bromides of H, Li, Na, K, Rb, Cs, and Fr	1E+4 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
35	Bromine-74 ²	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 ²	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 ²	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

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
35	Bromine-84 ²	D, see ^{74m} Br W, see ^{74m} Br	2E+4 St wall (3E+4) -	6E+4 - 6E+4	2E-5 - 3E-5	8E-8 - 9E-8	- 4E-4 -	- 4E-3 -
36	Krypton-74 ²	Submersion ¹	-	-	3E-6	1E-8	-	-
36	Krypton-76	Submersion ¹	-	-	9E-6	4E-8	-	-
36	Krypton-77 ²	Submersion ¹	-	-	4E-6	2E-8	-	-
36	Krypton-79	Submersion ¹	-	-	2E-5	7E-8	-	-
36	Krypton-81	Submersion ¹	-	-	7E-4	3E-6	-	-
36	Krypton-83m ²	Submersion ¹	-	-	1E-2	5E-5	-	-
36	Krypton-85m	Submersion ¹	-	-	2E-5	1E-7	-	-
36	Krypton-85	Submersion ¹	-	-	1E-4	7E-7	-	-
36	Krypton-87 ²	Submersion ¹	-	-	5E-6	2E-8	-	-
36	Krypton-88	Submersion ¹	-	-	2E-6	9E-9	-	-
37	Rubidium-79 ²	D, all compounds	4E+4 St wall (6E+4) -	1E+5 -	5E-5 -	2E-7 -	- 8E-4	- 8E-3
37	Rubidium-81m ²	D, all compounds	2E+5 St wall (3E+5) -	3E+5 -	1E-4 -	5E-7 -	- 4E-3	- 4E-2
37	Rubidium-81	D, all compounds	4E+4	5E+4	2E-5	7E-8	5E-4	5E-3
37	Rubidium-82m	D, all compounds	1E+4	2E+4	7E-6	2E-8	2E-4	2E-3
37	Rubidium-83	D, all compounds	6E+2	1E+3	4E-7	1E-9	9E-6	9E-5
37	Rubidium-84	D, all compounds	5E+2	8E+2	3E-7	1E-9	7E-6	7E-5
37	Rubidium-86	D, all compounds	5E+2	8E+2	3E-7	1E-9	7E-6	7E-5
37	Rubidium-87	D, all compounds	1E+3	2E+3	6E-7	2E-9	1E-5	1E-4
37	Rubidium-88 ²	D, all compounds	2E+4 St wall (3E+4) -	6E+4 -	3E-5 -	9E-8 -	- 4E-4	- 4E-3
37	Rubidium-89 ²	D, all compounds	4E+4 St wall (6E+4) -	1E+5 -	6E-5 -	2E-7 -	- 9E-4	- 9E-3
38	Strontium-80 ²	D, all soluble compounds except SrTiO ₃ Y, all insoluble compounds and SrTiO ₃	4E+3 -	1E+4 1E+4	5E-6 5E-6	2E-8 2E-8	6E-5 -	6E-4 -
38	Strontium-81 ²	D, see ⁸⁰ Sr Y, see ⁸⁰ Sr	3E+4 2E+4	8E+4 8E+4	3E-5 3E-5	1E-7 1E-7	3E-4 -	3E-3 -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
38	Strontium-82	D, see ⁸⁰ Sr Y, see ⁸⁰ Sr	3E+2 LLI wall (2E+2) 2E+2	4E+2 - 9E+1	2E-7 - 4E-8	6E-10 - 1E-10	- 3E-6 -	- 3E-5 -
38	Strontium-83	D, see ⁸⁰ Sr Y, see ⁸⁰ Sr	3E+3 2E+3	7E+3 4E+3	3E-6 1E-6	1E-8 5E-9	3E-5 -	3E-4 -
38	Strontium-85m ²	D, see ⁸⁰ Sr Y, see ⁸⁰ Sr	2E+5 -	6E+5 8E+5	3E-4 4E-4	9E-7 1E-6	3E-3 -	3E-2 -
38	Strontium-85	D, see ⁸⁰ Sr Y, see ⁸⁰ Sr	3E+3 -	3E+3 2E+3	1E-6 6E-7	4E-9 2E-9	4E-5 -	4E-4 -
38	Strontium-87m	D, see ⁸⁰ Sr Y, see ⁸⁰ Sr	5E+4 4E+4	1E+5 2E+5	5E-5 6E-5	2E-7 2E-7	6E-4 -	6E-3 -
38	Strontium-89	D, see ⁸⁰ Sr Y, see ⁸⁰ Sr	6E+2 LLI Wall (6E+2) 5E+2	8E+2 - 1E+2	4E-7 - 6E-8	1E-9 - 2E-10	- 8E-6 -	- 8E-5 -
38	Strontium-90	D, see ⁸⁰ Sr Y, see ⁸⁰ Sr	3E+1 Bone surf (4E+1) -	2E+1 Bone surf (2E+1) 4E+0	8E-9 - 2E-9	- 3E-11 6E-12	- 5E-7 -	- 5E-6 -
38	Strontium-91	D, see ⁸⁰ Sr Y, see ⁸⁰ Sr	2E+3 -	6E+3 4E+3	2E-6 1E-6	8E-9 5E-9	2E-5 -	2E-4 -
38	Strontium-92	D, see ⁸⁰ Sr Y, see ⁸⁰ Sr	3E+3 -	9E+3 7E+3	4E-6 3E-6	1E-8 9E-9	4E-5 -	4E-4 -
39	Yttrium-86m ²	W, all compounds except those given for Y, oxides and hydroxides	2E+4 -	6E+4 5E+4	2E-5 2E-5	8E-8 8E-8	3E-4 -	3E-3 -
39	Yttrium-86	W, see ^{86m} Y Y, see ^{86m} Y	1E+3 -	3E+3 3E+3	1E-6 1E-6	5E-9 5E-9	2E-5 -	2E-4 -
39	Yttrium-87	W, see ^{86m} Y Y, see ^{86m} Y	2E+3 -	3E+3 3E+3	1E-6 1E-6	5E-9 5E-9	3E-5 -	3E-4 -
39	Yttrium-88	W, see ^{86m} Y Y, see ^{86m} Y	1E+3 -	3E+2 2E+2	1E-7 1E-7	3E-10 3E-10	1E-5 -	1E-4 -
39	Yttrium-90m	W, see ^{86m} Y Y, see ^{86m} Y	8E+3 -	1E+4 1E+4	5E-6 5E-6	2E-8 2E-8	1E-4 -	1E-3 -
39	Yttrium-90	W, see ^{86m} Y Y, see ^{86m} Y	4E+2 LLI wall (5E+2) -	7E+2 - 6E+2	3E-7 - 3E-7	9E-10 - 9E-10	- 7E-6 -	- 7E-5 -
39	Yttrium-91m ²	W, see ^{86m} Y Y, see ^{86m} Y	1E+5 -	2E+5 2E+5	1E-4 7E-5	3E-7 2E-7	2E-3 -	2E-2 -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
39	Yttrium-91	W, see ^{86m} Y Y, see ^{86m} Y	5E+2 LLI wall (6E+2) -	2E+2 - 1E+2	7E-8 - 5E-8	2E-10 - 2E-10	- 8E-6 -	- 8E-5 -
39	Yttrium-92	W, see ^{86m} Y Y, see ^{86m} Y	3E+3 -	9E+3 8E+3	4E-6 3E-6	1E-8 1E-8	4E-5 -	4E-4 -
39	Yttrium-93	W, See ^{86m} Y Y, see ^{86m} Y	1E+3 -	3E+3 2E+3	1E-6 1E-6	4E-9 3E-9	2E-5 -	2E-4 -
39	Yttrium-94 ²	W, see ^{86m} Y Y, see ^{86m} Y	2E+4 St wall (3E+4) -	8E+4 - 8E+4	3E-5 - 3E-5	1E-7 - 1E-7	- 4E-4 -	- 4E-3 -
39	Yttrium-95 ²	W, see ^{86m} Y Y, see ^{86m} Y	4E+4 St wall (5E+4) -	2E+5 - 1E+5	6E-5 - 6E-5	2E-7 - 2E-7	- 7E-4 -	- 7E-3 -
40	Zirconium-86	D, all compounds except those given for W and Y W, oxides, hydroxides, halides, and nitrates Y, carbide	1E+3 - -	4E+3 3E+3 2E+3	2E-6 1E-6 1E-6	6E-9 4E-9 3E-9	2E-5 - -	2E-4 - -
40	Zirconium-88	D, see ⁸⁶ Zr W, see ⁸⁶ Zr Y, see ⁸⁶ Zr	4E+3 - -	2E+2 5E+2 3E+2	9E-8 2E-7 1E-7	3E-10 7E-10 4E-10	5E-5 - -	5E-4 - -
40	Zirconium-89	D, see ⁸⁶ Zr W, see ⁸⁶ Zr Y, see ⁸⁶ Zr	2E+3 - -	4E+3 2E+3 2E+3	1E-6 1E-6 1E-6	5E-9 3E-9 3E-9	2E-5 - -	2E-4 - -
40	Zirconium-93	D, see ⁸⁶ Zr W, see ⁸⁶ Zr Y, see ⁸⁶ Zr	1E+3 Bone surf (3E+3) - - - -	6E+0 Bone surf (2E+1) 2E+1 Bone surf (6E+1) 6E+1 Bone surf (7E+1)	3E-9 - 1E-8 - 2E-8 -	- 2E-11 - 9E-11 - 9E-11	- 4E-5 - - -	- 4E-4 - - -
40	Zirconium-95	D, see ⁸⁶ Zr W, see ⁸⁶ Zr Y, see ⁸⁶ Zr	1E+3 - - -	1E+2 Bone surf (3E+2) 4E+2 3E+2	5E-8 - 2E-7 1E-7	- 4E-10 5E-10 4E-10	2E-5 - - -	2E-4 - - -
40	Zirconium-97	D, see ⁸⁶ Zr W, see ⁸⁶ Zr Y, see ⁸⁶ Zr	6E+2 - -	2E+3 1E+3 1E+3	8E-7 6E-7 5E-7	3E-9 2E-9 2E-9	9E-6 - -	9E-5 - -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
41	Niobium-88 ²	W, all compounds except those given for Y Y, oxides and hydroxides	5E+4 St wall (7E+4) -	2E+5 - 2E+5	9E-5 - 9E-5	3E-7 - 3E-7	- 1E-3 -	- 1E-2 -
41	Niobium-89 ² (66 min)	W, see ⁸⁸ Nb Y, see ⁸⁸ Nb	1E+4 -	4E+4 4E+4	2E-5 2E-5	6E-8 5E-8	1E-4 -	1E-3 -
41	Niobium-89 (122 min)	W, see ⁸⁸ Nb Y, see ⁸⁸ Nb	5E+3 -	2E+4 2E+4	8E-6 6E-6	3E-8 2E-8	7E-5 -	7E-4 -
41	Niobium-90	W, see ⁸⁸ Nb Y, see ⁸⁸ Nb	1E+3 -	3E+3 2E+3	1E-6 1E-6	4E-9 3E-9	1E-5 -	1E-4 -
41	Niobium-93m	W, see ⁸⁸ Nb Y, see ⁸⁸ Nb	9E+3 LLI wall (1E+4) -	2E+3 - 2E+2	8E-7 - 7E-8	3E-9 - 2E-10	- 2E-4 -	- 2E-3 -
41	Niobium-94	W, see ⁸⁸ Nb Y, see ⁸⁸ Nb	9E+2 -	2E+2 2E+1	8E-8 6E-9	3E-10 2E-11	1E-5 -	1E-4 -
41	Niobium-95m	W, see ⁸⁸ Nb Y, see ⁸⁸ Nb	2E+3 LLI wall (2E+3) -	3E+3 - 2E+3	1E-6 - 9E-7	4E-9 - 3E-9	- 3E-5 -	- 3E-4 -
41	Niobium-95	W, see ⁸⁸ Nb Y, see ⁸⁸ Nb	2E+3 -	1E+3 1E+3	5E-7 5E-7	2E-9 2E-9	3E-5 -	3E-4 -
41	Niobium-96	W, see ⁸⁸ Nb Y, see ⁸⁸ Nb	1E+3 -	3E+3 2E+3	1E-6 1E-6	4E-9 3E-9	2E-5 -	2E-4 -
41	Niobium-97 ²	W, see ⁸⁸ Nb Y, see ⁸⁸ Nb	2E+4 -	8E+4 7E+4	3E-5 3E-5	1E-7 1E-7	3E-4 -	3E-3 -
41	Niobium-98 ²	W, see ⁸⁸ Nb Y, see ⁸⁸ Nb	1E+4 -	5E+4 5E+4	2E-5 2E-5	8E-8 7E-8	2E-4 -	2E-3 -
42	Molybdenum-90	D, all compounds except those given for Y Y, oxides, hydroxides, and MoS ₂	4E+3 2E+3	7E+3 5E+3	3E-6 2E-6	1E-8 6E-9	3E-5 -	3E-4 -
42	Molybdenum-93m	D, see ⁹⁰ Mo Y, see ⁹⁰ Mo	9E+3 4E+3	2E+4 1E+4	7E-6 6E-6	2E-8 2E-8	6E-5 -	6E-4 -
42	Molybdenum-93	D, see ⁹⁰ Mo Y, see ⁹⁰ Mo	4E+3 2E+4	5E+3 2E+2	2E-6 8E-8	8E-9 2E-10	5E-5 -	5E-4 -
42	Molybdenum-99	D, see ⁹⁰ Mo Y, see ⁹⁰ Mo	2E+3 LLI wall (1E+3) 1E+3	3E+3 - 1E+3	1E-6 - 6E-7	4E-9 - 2E-9	- 2E-5 -	- 2E-4 -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
42	Molybdenum-101 ²	D, see ⁹⁰ Mo Y, see ⁹⁰ Mo	4E+4 St wall (5E+4) -	1E+5 - 1E+5	6E-5 - 6E-5	2E-7 - 2E-7	- 7E-4 -	- 7E-3 -
43	Technetium-93m ²	D, all compounds except those given for W, oxides, hydroxides, halides, and nitrates	7E+4 -	2E+5 3E+5	6E-5 1E-4	2E-7 4E-7	1E-3 -	1E-2 -
43	Technetium-93	D, see ^{93m} Tc W, see ^{93m} Tc	3E+4 -	7E+4 1E+5	3E-5 4E-5	1E-7 1E-7	4E-4 -	4E-3 -
43	Technetium-94m ²	D, see ^{93m} Tc W, see ^{93m} Tc	2E+4 -	4E+4 6E+4	2E-5 2E-5	6E-8 8E-8	3E-4 -	3E-3 -
43	Technetium-94	D, see ^{93m} Tc W, see ^{93m} Tc	9E+3 -	2E+4 2E+4	8E-6 1E-5	3E-8 3E-8	1E-4 -	1E-3 -
43	Technetium-95m	D, see ^{93m} Tc W, see ^{93m} Tc	4E+3 -	5E+3 2E+3	2E-6 8E-7	8E-9 3E-9	5E-5 -	5E-4 -
43	Technetium-95	D, see ^{93m} Tc W, see ^{93m} Tc	1E+4 -	2E+4 2E+4	9E-6 8E-6	3E-8 3E-8	1E-4 -	1E-3 -
43	Technetium-96m ²	D, see ^{93m} Tc W, see ^{93m} Tc	2E+5 -	3E+5 2E+5	1E-4 1E-4	4E-7 3E-7	2E-3 -	2E-2 -
43	Technetium-96	D, see ^{93m} Tc W, see ^{93m} Tc	2E+3 -	3E+3 2E+3	1E-6 9E-7	5E-9 3E-9	3E-5 -	3E-4 -
43	Technetium-97m	D, see ^{93m} Tc W, see ^{93m} Tc	5E+3 -	7E+3 St wall (7E+3) 1E+3	3E-6 - 5E-7	- 1E-8 2E-9	6E-5 - -	6E-4 - -
43	Technetium-97	D, see ^{93m} Tc W, see ^{93m} Tc	4E+4 -	5E+4 6E+3	2E-5 2E-6	7E-8 8E-9	5E-4 -	5E-3 -
43	Technetium-98	D, see ^{93m} Tc W, see ^{93m} Tc	1E+3 -	2E+3 3E+2	7E-7 1E-7	2E-9 4E-10	1E-5 -	1E-4 -
43	Technetium-99m	D, see ^{93m} Tc W, see ^{93m} Tc	8E+4 -	2E+5 2E+5	6E-5 1E-4	2E-7 3E-7	1E-3 -	1E-2 -
43	Technetium-99	D, see ^{93m} Tc W, see ^{93m} Tc	4E+3 -	5E+3 St wall (6E+3) 7E+2	2E-6 - 3E-7	- 8E-9 9E-10	6E-5 - -	6E-4 - -
43	Technetium-101 ²	D, see ^{93m} Tc W, see ^{93m} Tc	9E+4 St wall (1E+5) -	3E+5 - 4E+5	1E-4 - 2E-4	5E-7 - 5E-7	- 2E-3 -	- 2E-2 -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
43	Technetium-104 ²	D, see ^{93m} Tc W, see ^{93m} Tc	2E+4 St wall (3E+4) -	7E+4 - 9E+4	3E-5 - 4E-5	1E-7 - 1E-7	- 4E-4 -	- 4E-3 -
44	Ruthenium-94 ²	D, all compounds except those given for W and Y W, halides Y, oxides and hydroxides	2E+4 - -	4E+4 6E+4 6E+4	2E-5 3E-5 2E-5	6E-8 9E-8 8E-8	2E-4 - -	2E-3 - -
44	Ruthenium-97	D, see ⁹⁴ Ru W, see ⁹⁴ Ru Y, see ⁹⁴ Ru	8E+3 - -	2E+4 1E+4 1E+4	8E-6 5E-6 5E-6	3E-8 2E-8 2E-8	1E-4 - -	1E-3 - -
44	Ruthenium-103	D, see ⁹⁴ Ru W, see ⁹⁴ Ru Y, see ⁹⁴ Ru	2E+3 - -	2E+3 1E+3 6E+2	7E-7 4E-7 3E-7	2E-9 1E-9 9E-10	3E-5 - -	3E-4 - -
44	Ruthenium-105	D, see ⁹⁴ Ru W, see ⁹⁴ Ru Y, see ⁹⁴ Ru	5E+3 - -	1E+4 1E+4 1E+4	6E-6 6E-6 5E-6	2E-8 2E-8 2E-8	7E-5 - -	7E-4 - -
44	Ruthenium-106	D, see ⁹⁴ Ru W, see ⁹⁴ Ru Y, see ⁹⁴ Ru	2E+2 LLI wall (2E+2) - -	9E+1 - 5E+1 1E+1	4E-8 - 2E-8 5E-9	1E-10 - 8E-11 2E-11	- 3E-6 - -	- 3E-5 - -
45	Rhodium-99m	D, all compounds except those given for W and Y W, halides Y, oxides and hydroxides	2E+4 - -	6E+4 8E+4 7E+4	2E-5 3E-5 3E-5	8E-8 1E-7 9E-8	2E-4 - -	2E-3 - -
45	Rhodium-99	D, see ^{99m} Rh W, see ^{99m} Rh Y, see ^{99m} Rh	2E+3 - -	3E+3 2E+3 2E+3	1E-6 9E-7 8E-7	4E-9 3E-9 3E-9	3E-5 - -	3E-4 - -
45	Rhodium-100	D, see ^{99m} Rh W, see ^{99m} Rh Y, see ^{99m} Rh	2E+3 - -	5E+3 4E+3 4E+3	2E-6 2E-6 2E-6	7E-9 6E-9 5E-9	2E-5 - -	2E-4 - -
45	Rhodium-101m	D, see ^{99m} Rh W, see ^{99m} Rh Y, see ^{99m} Rh	6E+3 - -	1E+4 8E+3 8E+3	5E-6 4E-6 3E-6	2E-8 1E-8 1E-8	8E-5 - -	8E-4 - -
45	Rhodium-101	D, see ^{99m} Rh W, see ^{99m} Rh Y, see ^{99m} Rh	2E+3 - -	5E+2 8E+2 2E+2	2E-7 3E-7 6E-8	7E-10 1E-9 2E-10	3E-5 - -	3E-4 - -
45	Rhodium 102m	D, see ^{99m} Rh W, see ^{99m} Rh Y, see ^{99m} Rh	1E+3 LLI wall (1E+3) - -	5E+2 - 4E+2 1E+2	2E-7 - 2E-7 5E-8	7E-10 - 5E-10 2E-10	- 2E-5 - -	- 2E-4 - -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
45	Rhodium-102	D, see ^{99m} Rh W, see ^{99m} Rh Y, see ^{99m} Rh	6E+2 - -	9E+1 2E+2 6E+1	4E-8 7E-8 2E-8	1E-10 2E-10 8E-11	8E-6 - -	8E-5 - -
45	Rhodium-103m ²	D, see ^{99m} Rh W, see ^{99m} Rh Y, see ^{99m} Rh	4E+5 - -	1E+6 1E+6 1E+6	5E-4 5E-4 5E-4	2E-6 2E-6 2E-6	6E-3 - -	6E-2 - -
45	Rhodium-105	D, see ^{99m} Rh W, see ^{99m} Rh Y, see ^{99m} Rh	4E+3 LLI wall (4E+3) - -	1E+4 - 6E+3 6E+3	5E-6 - 3E-6 2E-6	2E-8 - 9E-9 8E-9	- 5E-5 - -	- 5E-4 - -
45	Rhodium-106m	D, see ^{99m} Rh W, see ^{99m} Rh Y, see ^{99m} Rh	8E+3 - -	3E+4 4E+4 4E+4	1E-5 2E-5 1E-5	4E-8 5E-8 5E-8	1E-4 - -	1E-3 - -
45	Rhodium-107 ²	D, see ^{99m} Rh W, see ^{99m} Rh Y, see ^{99m} Rh	7E+4 St wall (9E+4) - -	2E+5 - 3E+5 3E+5	1E-4 - 1E-4 1E-4	3E-7 - 4E-7 3E-7	- 1E-3 - -	- 1E-2 - -
46	Palladium-100	D, all compounds except those given for W and Y W, nitrates Y, oxides and hydroxides	1E+3 - -	1E+3 1E+3 1E+3	6E-7 5E-7 6E-7	2E-9 2E-9 2E-9	2E-5 - -	2E-4 - -
46	Palladium-101	D, see ¹⁰⁰ Pd W, see ¹⁰⁰ Pd Y, see ¹⁰⁰ Pd	1E+4 - -	3E+4 3E+4 3E+4	1E-5 1E-5 1E-5	5E-8 5E-8 4E-8	2E-4 - -	2E-3 - -
46	Palladium-103	D, see ¹⁰⁰ Pd W, see ¹⁰⁰ Pd Y, see ¹⁰⁰ Pd	6E+3 LLI wall (7E+3) - -	6E+3 - 4E+3 4E+3	3E-6 - 2E-6 1E-6	9E-9 - 6E-9 5E-9	- 1E-4 - -	- 1E-3 - -
46	Palladium-107	D, see ¹⁰⁰ Pd W, see ¹⁰⁰ Pd Y, see ¹⁰⁰ Pd	3E+4 LLI wall (4E+4) - -	2E+4 Kidneys (2E+4) 7E+3 4E+2	9E-6 - 3E-6 2E-7	- 3E-8 1E-8 6E-10	- 5E-4 - -	- 3E-3 - -
46	Palladium-109	D, see ¹⁰⁰ Pd W, see ¹⁰⁰ Pd Y, see ¹⁰⁰ Pd	2E+3 - -	6E+3 5E+3 5E+3	3E-6 2E-6 2E-6	9E-9 8E-9 6E-9	3E-5 - -	3E-4 - -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air ($\mu\text{Ci}/\text{ml}$)	Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				ALI (μCi)	DAC ($\mu\text{Ci}/\text{ml}$)			
47	Silver-102 ²	D, all compounds except those given for W and Y W, nitrates and sulfides Y, oxides and hydroxides	5E+4 St wall (6E+4) -	2E+5 - 2E+5 2E+5	8E-5 - 9E-5 8E-5	2E-7 - 3E-7 3E-7	- 9E-4 - -	- 9E-3 - -
47	Silver-103 ²	D, see ¹⁰² Ag W, see ¹⁰² Ag Y, see ¹⁰² Ag	4E+4 - -	1E+5 1E+5 1E+5	4E-5 5E-5 5E-5	1E-7 2E-7 2E-7	5E-4 - -	5E-3 - -
47	Silver-104m ²	D, see ¹⁰² Ag W, see ¹⁰² Ag Y, see ¹⁰² Ag	3E+4 - -	9E+4 1E+5 1E+5	4E-5 5E-5 5E-5	1E-7 2E-7 2E-7	4E-4 - -	4E-3 - -
47	Silver-104 ²	D, see ¹⁰² Ag W, see ¹⁰² Ag Y, see ¹⁰² Ag	2E+4 - -	7E+4 1E+5 1E+5	3E-5 6E-5 6E-5	1E-7 2E-7 2E-7	3E-4 - -	3E-3 - -
47	Silver-105	D, see ¹⁰² Ag W, see ¹⁰² Ag Y, see ¹⁰² Ag	3E+3 - -	1E+3 2E+3 2E+3	4E-7 7E-7 7E-7	1E-9 2E-9 2E-9	4E-5 - -	4E-4 - -
47	Silver-106m	D, see ¹⁰² Ag W, see ¹⁰² Ag Y, see ¹⁰² Ag	8E+2 - -	7E+2 9E+2 9E+2	3E-7 4E-7 4E-7	1E-9 1E-9 1E-9	1E-5 - -	1E-4 - -
47	Silver-106 ²	D, see ¹⁰² Ag W, see ¹⁰² Ag Y, see ¹⁰² Ag	6E+4 St wall (6E+4) - -	2E+5 - 2E+5 2E+5	8E-5 - 9E-5 8E-5	3E-7 - 3E-7 3E-7	- 9E-4 - -	- 9E-3 - -
47	Silver-108m	D, see ¹⁰² Ag W, see ¹⁰² Ag Y, see ¹⁰² Ag	6E+2 - -	2E+2 3E+2 2E+1	8E-8 1E-7 1E-8	3E-10 4E-10 3E-11	9E-6 - -	9E-5 - -
47	Silver-110m	D, see ¹⁰² Ag W, see ¹⁰² Ag Y, see ¹⁰² Ag	5E+2 - -	1E+2 2E+2 9E+1	5E-8 8E-8 4E-8	2E-10 3E-10 1E-10	6E-6 - -	6E-5 - -
47	Silver-111	D, see ¹⁰² Ag W, see ¹⁰² Ag Y, see ¹⁰² Ag	9E+2 LLI wall (1E+3) - -	2E+3 Liver (2E+3) 9E+2 9E+2	6E-7 - 4E-7 4E-7	- 2E-9 1E-9 1E-9	- 2E-5 - -	- 2E-4 - -
47	Silver-112	D, see ¹⁰² Ag W, see ¹⁰² Ag Y, see ¹⁰² Ag	3E+3 - -	8E+3 1E+4 9E+3	3E-6 4E-6 4E-6	1E-8 1E-8 1E-8	4E-5 - -	4E-4 - -
47	Silver-115 ²	D, see ¹⁰² Ag W, see ¹⁰² Ag Y, see ¹⁰² Ag	3E+4 St wall (3E+4) - -	9E+4 - 9E+4 8E+4	4E-5 - 4E-5 3E-5	1E-7 - 1E-7 1E-7	- 4E-4 - -	- 4E-3 - -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
48	Cadmium-104 ²	D, all compounds except those given for W and Y W, sulfides, halides, and nitrates Y, oxides and hydroxides	2E+4 - -	7E+4 1E+5 1E+5	3E-5 5E-5 5E-5	9E-8 2E-7 2E-7	3E-4 - -	3E-3 - -
48	Cadmium-107	D, see ¹⁰⁴ Cd W, see ¹⁰⁴ Cd Y, see ¹⁰⁴ Cd	2E+4 - -	5E+4 6E+4 5E+4	2E-5 2E-5 2E-5	8E-8 8E-8 7E-8	3E-4 - -	3E-3 - -
48	Cadmium-109	D, see ¹⁰⁴ Cd W, see ¹⁰⁴ Cd Y, see ¹⁰⁴ Cd	3E+2 Kidneys (4E+2) - -	4E+1 Kidneys (5E+1) 1E+2 Kidneys (1E+2) 1E+2	1E-8 - 5E-8 - 5E-8	- 7E-11 - 2E-10 2E-10	- 6E-6 - - -	- 6E-5 - - -
48	Cadmium-113m	D, see ¹⁰⁴ Cd W, see ¹⁰⁴ Cd Y, see ¹⁰⁴ Cd	2E+1 Kidneys (4E+1) - -	2E+0 Kidneys (4E+0) 8E+0 Kidneys (1E+1) 1E+1	1E-9 - 4E-9 - 5E-9	- 5E-12 - 2E-11 2E-11	- 5E-7 - - -	- 5E-6 - - -
48	Cadmium-113	D, see ¹⁰⁴ Cd W, see ¹⁰⁴ Cd Y, see ¹⁰⁴ Cd	2E+1 Kidneys (3E+1) - -	2E+0 Kidneys (3E+0) 8E+0 Kidneys (1E+1) 1E+1	9E-10 - 3E-9 - 6E-9	- 5E-12 - 2E-11 2E-11	- 4E-7 - - -	- 4E-6 - - -
48	Cadmium-115m	D, see ¹⁰⁴ Cd W, see ¹⁰⁴ Cd Y, see ¹⁰⁴ Cd	3E+2 - -	5E+1 Kidneys (8E+1) 1E+2 1E+2	2E-8 - 5E-8 6E-8	- 1E-10 2E-10 2E-10	4E-6 - - -	4E-5 - - -
48	Cadmium-115	D, see ¹⁰⁴ Cd W, see ¹⁰⁴ Cd Y, see ¹⁰⁴ Cd	9E+2 LLI wall (1E+3) - -	1E+3 - 1E+3 1E+3	6E-7 - 5E-7 6E-7	2E-9 - 2E-9 2E-9	- 1E-5 - -	- 1E-4 - -
48	Cadmium-117m ²	D, see ¹⁰⁴ Cd W, see ¹⁰⁴ Cd Y, see ¹⁰⁴ Cd	5E+3 - -	1E+4 2E+4 1E+4	5E-6 7E-6 6E-6	2E-8 2E-8 2E-8	6E-5 - -	6E-4 - -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air ($\mu\text{Ci}/\text{ml}$)	Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				ALI (μCi)	DAC ($\mu\text{Ci}/\text{ml}$)			
48	Cadmium-117	D, see ^{104}Cd W, see ^{104}Cd Y, see ^{104}Cd	5E+3 -	1E+4 2E+4 1E+4	5E-6 7E-6 6E-6	2E-8 2E-8 2E-8	6E-5 -	6E-4 -
49	Indium-109	D, all compounds except those given for W, oxides, hydroxides, halides, and nitrates	2E+4 -	4E+4 6E+4	2E-5 3E-5	6E-8 9E-8	3E-4 -	3E-3 -
49	Indium-110 ² (69.1 min)	D, see ^{109}In W, see ^{109}In	2E+4 -	4E+4 6E+4	2E-5 2E-5	6E-8 8E-8	2E-4 -	2E-3 -
49	Indium-110 (4.9 h)	D, see ^{109}In W, see ^{109}In	5E+3 -	2E+4 2E+4	7E-6 8E-6	2E-8 3E-8	7E-5 -	7E-4 -
49	Indium-111	D, see ^{109}In W, see ^{109}In	4E+3 -	6E+3 6E+3	3E-6 3E-6	9E-9 9E-9	6E-5 -	6E-4 -
49	Indium-112 ²	D, see ^{109}In W, see ^{109}In	2E+5 -	6E+5 7E+5	3E-4 3E-4	9E-7 1E-6	2E-3 -	2E-2 -
49	Indium-113m ²	D, see ^{109}In W, see ^{109}In	5E+4 -	1E+5 2E+5	6E-5 8E-5	2E-7 3E-7	7E-4 -	7E-3 -
49	Indium-114m	D, see ^{109}In W, see ^{109}In	3E+2 LLI wall (4E+2) -	6E+1 - 1E+2	3E-8 - 4E-8	9E-11 - 1E-10	- 5E-6 -	- 5E-5 -
49	Indium-115m	D, see ^{109}In W, see ^{109}In	1E+4 -	4E+4 5E+4	2E-5 2E-5	6E-8 7E-8	2E-4 -	2E-3 -
49	Indium-115	D, see ^{109}In W, see ^{109}In	4E+1 -	1E+0 5E+0	6E-10 2E-9	2E-12 8E-12	5E-7 -	5E-6 -
49	Indium-116m ²	D, see ^{109}In W, see ^{109}In	2E+4 -	8E+4 1E+5	3E-5 5E-5	1E-7 2E-7	3E-4 -	3E-3 -
49	Indium-117m ²	D, see ^{109}In W, see ^{109}In	1E+4 -	3E+4 4E+4	1E-5 2E-5	5E-8 6E-8	2E-4 -	2E-3 -
49	Indium-117 ²	D, see ^{109}In W, see ^{109}In	6E+4 -	2E+5 2E+5	7E-5 9E-5	2E-7 3E-7	8E-4 -	8E-3 -
49	Indium-119m ²	D, see ^{109}In W, see ^{109}In	4E+4 St wall (5E+4) -	1E+5 - 1E+5	5E-5 - 6E-5	2E-7 - 2E-7	- 7E-4 -	- 7E-3 -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
50	Tin-110	D, all compounds except those given for W, sulfides, oxides, hydroxides, halides, nitrates, and stannic phosphate	4E+3 -	1E+4 1E+4	5E-6 5E-6	2E-8 2E-8	5E-5 -	5E-4 -
50	Tin-111 ²	D, see ¹¹⁰ Sn W, see ¹¹⁰ Sn	7E+4 -	2E+5 3E+5	9E-5 1E-4	3E-7 4E-7	1E-3 -	1E-2 -
50	Tin-113	D, see ¹¹⁰ Sn W, see ¹¹⁰ Sn	2E+3 LLI wall (2E+3) -	1E+3 - 5E+2	5E-7 - 2E-7	2E-9 - 8E-10	- 3E-5 -	- 3E-4 -
50	Tin-117m	D, see ¹¹⁰ Sn W, see ¹¹⁰ Sn	2E+3 LLI wall (2E+3) -	1E+3 Bone surf (2E+3) 1E+3	5E-7 - 6E-7	- 3E-9 2E-9	- 3E-5 -	- 3E-4 -
50	Tin-119m	D, see ¹¹⁰ Sn W, see ¹¹⁰ Sn	3E+3 LLI wall (4E+3) -	2E+3 - 1E+3	1E-6 - 4E-7	3E-9 - 1E-9	- 6E-5 -	- 6E-4 -
50	Tin-121m	D, see ¹¹⁰ Sn W, see ¹¹⁰ Sn	3E+3 LLI wall (4E+3) -	9E+2 - 5E+2	4E-7 - 2E-7	1E-9 - 8E-10	- 5E-5 -	- 5E-4 -
50	Tin-121	D, see ¹¹⁰ Sn W, see ¹¹⁰ Sn	6E+3 LLI wall (6E+3) -	2E+4 - 1E+4	6E-6 - 5E-6	2E-8 - 2E-8	- 8E-5 -	- 8E-4 -
50	Tin-123m ²	D, see ¹¹⁰ Sn W, see ¹¹⁰ Sn	5E+4 -	1E+5 1E+5	5E-5 6E-5	2E-7 2E-7	7E-4 -	7E-3 -
50	Tin-123	D, see ¹¹⁰ Sn W, see ¹¹⁰ Sn	5E+2 LLI wall (6E+2) -	6E+2 - 2E+2	3E-7 - 7E-8	9E-10 - 2E-10	- 9E-6 -	- 9E-5 -
50	Tin-125	D, see ¹¹⁰ Sn W, see ¹¹⁰ Sn	4E+2 LLI wall (5E+2) -	9E+2 - 4E+2	4E-7 - 1E-7	1E-9 - 5E-10	- 6E-6 -	- 6E-5 -
50	Tin-126	D, see ¹¹⁰ Sn W, see ¹¹⁰ Sn	3E+2 -	6E+1 7E+1	2E-8 3E-8	8E-11 9E-11	4E-6 -	4E-5 -
50	Tin-127	D, see ¹¹⁰ Sn W, see ¹¹⁰ Sn	7E+3 -	2E+4 2E+4	8E-6 8E-6	3E-8 3E-8	9E-5 -	9E-4 -
50	Tin-128 ²	D, see ¹¹⁰ Sn W, see ¹¹⁰ Sn	9E+3 -	3E+4 4E+4	1E-5 1E-5	4E-8 5E-8	1E-4 -	1E-3 -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
51	Antimony-115 ²	D, all compounds except those given for W, oxides, hydroxides, halides, sulfides, sulfates, and nitrates	8E+4 -	2E+5 3E+5	1E-4 1E-4	3E-7 4E-7	1E-3 -	1E-2 -
51	Antimony-116m ²	D, see ¹¹⁵ Sb W, see ¹¹⁵ Sb	2E+4 -	7E+4 1E+5	3E-5 6E-5	1E-7 2E-7	3E-4 -	3E-3 -
51	Antimony-116 ²	D, see ¹¹⁵ Sb W, see ¹¹⁵ Sb	7E+4 St wall (9E+4) -	3E+5 - 3E+5	1E-4 - 1E-4	4E-7 - 5E-7	- 1E-3 -	- 1E-2 -
51	Antimony-117	D, see ¹¹⁵ Sb W, see ¹¹⁵ Sb	7E+4 -	2E+5 3E+5	9E-5 1E-4	3E-7 4E-7	9E-4 -	9E-3 -
51	Antimony-118m	D, see ¹¹⁵ Sb W, see ¹¹⁵ Sb	6E+3 5E+3	2E+4 2E+4	8E-6 9E-6	3E-8 3E-8	7E-5 -	7E-4 -
51	Antimony-119	D, see ¹¹⁵ Sb W, see ¹¹⁵ Sb	2E+4 2E+4	5E+4 3E+4	2E-5 1E-5	6E-8 4E-8	2E-4 -	2E-3 -
51	Antimony-120 ² (16 min)	D, see ¹¹⁵ Sb W, see ¹¹⁵ Sb	1E+5 St wall (2E+5) -	4E+5 - 5E+5	2E-4 - 2E-4	6E-7 - 7E-7	- 2E-3 -	- 2E-2 -
51	Antimony-120 (5.76 d)	D, see ¹¹⁵ Sb W, see ¹¹⁵ Sb	1E+3 9E+2	2E+3 1E+3	9E-7 5E-7	3E-9 2E-9	1E-5 -	1E-4 -
51	Antimony-122	D, see ¹¹⁵ Sb W, see ¹¹⁵ Sb	8E+2 LLI wall (8E+2) 7E+2	2E+3 - 1E+3	1E-6 - 4E-7	3E-9 - 2E-9	- 1E-5 -	- 1E-4 -
51	Antimony-124m ²	D, see ¹¹⁵ Sb W, see ¹¹⁵ Sb	3E+5 2E+5	8E+5 6E+5	4E-4 2E-4	1E-6 8E-7	3E-3 -	3E-2 -
51	Antimony-124	D, see ¹¹⁵ Sb W, see ¹¹⁵ Sb	6E+2 5E+2	9E+2 2E+2	4E-7 1E-7	1E-9 3E-10	7E-6 -	7E-5 -
51	Antimony-125	D, see ¹¹⁵ Sb W, see ¹¹⁵ Sb	2E+3 -	2E+3 5E+2	1E-6 2E-7	3E-9 7E-10	3E-5 -	3E-4 -
51	Antimony-126m ²	D, see ¹¹⁵ Sb W, see ¹¹⁵ Sb	5E+4 St wall (7E+4) -	2E+5 - 2E+5	8E-5 - 8E-5	3E-7 - 3E-7	- 9E-4 -	- 9E-3 -
51	Antimony-126	D, see ¹¹⁵ Sb W, see ¹¹⁵ Sb	6E+2 5E+2	1E+3 5E+2	5E-7 2E-7	2E-9 7E-10	7E-6 -	7E-5 -
51	Antimony-127	D, see ¹¹⁵ Sb W, see ¹¹⁵ Sb	8E+2 LLI wall (8E+2) 7E+2	2E+3 - 9E+2	9E-7 - 4E-7	3E-9 - 1E-9	- 1E-5 -	- 1E-4 -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
51	Antimony-128 ² (10.4 min)	D, see ¹¹⁵ Sb W, see ¹¹⁵ Sb	8E+4 St wall (1E+5) -	4E+5 - 4E+5	2E-4 - 2E-4	5E-7 - 6E-7	- 1E-3 -	- 1E-2 -
51	Antimony-128 (9.01 h)	D, see ¹¹⁵ Sb W, see ¹¹⁵ Sb	1E+3 -	4E+3 3E+3	2E-6 1E-6	6E-9 5E-9	2E-5 -	2E-4 -
51	Antimony-129	D, see ¹¹⁵ Sb W, see ¹¹⁵ Sb	3E+3 -	9E+3 9E+3	4E-6 4E-6	1E-8 1E-8	4E-5 -	4E-4 -
51	Antimony-130 ²	D, see ¹¹⁵ Sb W, see ¹¹⁵ Sb	2E+4 -	6E+4 8E+4	3E-5 3E-5	9E-8 1E-7	3E-4 -	3E-3 -
51	Antimony-131 ²	D, see ¹¹⁵ Sb W, see ¹¹⁵ Sb	1E+4 Thyroid (2E+4) - -	2E+4 Thyroid (4E+4) 2E+4 Thyroid (4E+4) -	1E-5 - 1E-5 -	- 6E-8 - 6E-8	- 2E-4 - -	- 2E-3 - -
52	Tellurium-116	D, all compounds except those given for W, oxides, hydroxides, and nitrates	8E+3 -	2E+4 3E+4	9E-6 1E-5	3E-8 4E-8	1E-4 -	1E-3 -
52	Tellurium-121m	D, see ¹¹⁶ Te W, see ¹¹⁶ Te	5E+2 Bone surf (7E+2) -	2E+2 Bone surf (4E+2) 4E+2	8E-8 - 2E-7	- 5E-10 6E-10	- 1E-5 -	- 1E-4 -
52	Tellurium-121	D, see ¹¹⁶ Te W, see ¹¹⁶ Te	3E+3 -	4E+3 3E+3	2E-6 1E-6	6E-9 4E-9	4E-5 -	4E-4 -
52	Tellurium-123m	D, see ¹¹⁶ Te W, see ¹¹⁶ Te	6E+2 Bone surf (1E+3) -	2E+2 Bone surf (5E+2) 5E+2	9E-8 - 2E-7	- 8E-10 8E-10	- 1E-5 -	- 1E-4 -
52	Tellurium-123	D, see ¹¹⁶ Te W, see ¹¹⁶ Te	5E+2 Bone surf (1E+3) - -	2E+2 Bone surf (5E+2) 4E+2 Bone surf (1E+3)	8E-8 - 2E-7 -	- 7E-10 - 2E-9	- 2E-5 - -	- 2E-4 - -
52	Tellurium-125m	D, see ¹¹⁶ Te W, see ¹¹⁶ Te	1E+3 Bone surf (1E+3) -	4E+2 Bone surf (1E+3) 7E+2	2E-7 - 3E-7	- 1E-9 1E-9	- 2E-5 -	- 2E-4 -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
52	Tellurium-127m	D, see ¹¹⁶ Te W, see ¹¹⁶ Te	6E+2 -	3E+2 Bone surf (4E+2) 3E+2	1E-7 - 1E-7	- 6E-10 4E-10	9E-6 - -	9E-5 - -
52	Tellurium-127	D, see ¹¹⁶ Te W, see ¹¹⁶ Te	7E+3 -	2E+4 2E+4	9E-6 7E-6	3E-8 2E-8	1E-4 -	1E-3 -
52	Tellurium-129m	D, see ¹¹⁶ Te W, see ¹¹⁶ Te	5E+2 -	6E+2 2E+2	3E-7 1E-7	9E-10 3E-10	7E-6 -	7E-5 -
52	Tellurium-129 ²	D, see ¹¹⁶ Te W, see ¹¹⁶ Te	3E+4 -	6E+4 7E+4	3E-5 3E-5	9E-8 1E-7	4E-4 -	4E-3 -
52	Tellurium-131m	D, see ¹¹⁶ Te W, see ¹¹⁶ Te	3E+2 Thyroid (6E+2) - -	4E+2 Thyroid (1E+3) 4E+2 Thyroid (9E+2)	2E-7 - 2E-7 -	- 2E-9 - 1E-9	- 8E-6 - -	- 8E-5 - -
52	Tellurium-131 ²	D, see ¹¹⁶ Te W, see ¹¹⁶ Te	3E+3 Thyroid (6E+3) - -	5E+3 Thyroid (1E+4) 5E+3 Thyroid (1E+4)	2E-6 - 2E-6 -	- 2E-8 - 2E-8	- 8E-5 - -	- 8E-4 - -
52	Tellurium-132	D, see ¹¹⁶ Te W, see ¹¹⁶ Te	2E+2 Thyroid (7E+2) - -	2E+2 Thyroid (8E+2) 2E+2 Thyroid (6E+2)	9E-8 - 9E-8 -	- 1E-9 - 9E-10	- 9E-6 - -	- 9E-5 - -
52	Tellurium-133m ²	D, see ¹¹⁶ Te W, see ¹¹⁶ Te	3E+3 Thyroid (6E+3) - -	5E+3 Thyroid (1E+4) 5E+3 Thyroid (1E+4)	2E-6 - 2E-6 -	- 2E-8 - 2E-8	- 9E-5 - -	- 9E-4 - -
52	Tellurium-133 ²	D, see ¹¹⁶ Te W, see ¹¹⁶ Te	1E+4 Thyroid (3E+4) - -	2E+4 Thyroid (6E+4) 2E+4 Thyroid (6E+4)	9E-6 - 9E-6 -	- 8E-8 - 8E-8	- 4E-4 - -	- 4E-3 - -
52	Tellurium-134 ²	D, see ¹¹⁶ Te W, see ¹¹⁶ Te	2E+4 Thyroid (2E+4) - -	2E+4 Thyroid (5E+4) 2E+4 Thyroid (5E+4)	1E-5 - 1E-5 -	- 7E-8 - 7E-8	- 3E-4 - -	- 3E-3 - -
53	Iodine-120m ²	D, all compounds	1E+4 Thyroid (1E+4)	2E+4 -	9E-6 -	3E-8 -	- 2E-4	- 2E-3

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
53	Iodine-120 ²	D, all compounds	4E+3 Thyroid (8E+3)	9E+3 Thyroid (1E+4)	4E-6 -	- 2E-8	- 1E-4	- 1E-3
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 ²	D, all compounds	4E+4 St wall (6E+4)	1E+5 -	5E-5 -	2E-7 -	- 8E-4	- 8E-3
53	Iodine-129	D, all compounds	5E+0 Thyroid (2E+1)	9E+0 Thyroid (3E+1)	4E-9 -	- 4E-11	- 2E-7	- 2E-6
53	Iodine-130	D, all compounds	4E+2 Thyroid (1E+3)	7E+2 Thyroid (2E+3)	3E-7 -	- 3E-9	- 2E-5	- 2E-4
53	Iodine-131	D, all compounds	3E+1 Thyroid (9E+1)	5E+1 Thyroid (2E+2)	2E-8 -	- 2E-10	- 1E-6	- 1E-5
53	Iodine-132m ²	D, all compounds	4E+3 Thyroid (1E+4)	8E+3 Thyroid (2E+4)	4E-6 -	- 3E-8	- 1E-4	- 1E-3
53	Iodine-132	D, all compounds	4E+3 Thyroid (9E+3)	8E+3 Thyroid (1E+4)	3E-6 -	- 2E-8	- 1E-4	- 1E-3
53	Iodine-133	D, all compounds	1E+2 Thyroid (5E+2)	3E+2 Thyroid (9E+2)	1E-7 -	- 1E-9	- 7E-6	- 7E-5
53	Iodine-134 ²	D, all compounds	2E+4 Thyroid (3E+4)	5E+4 -	2E-5 -	6E-8 -	- 4E-4	- 4E-3
53	Iodine-135	D, all compounds	8E+2 Thyroid (3E+3)	2E+3 Thyroid (4E+3)	7E-7 -	- 6E-9	- 3E-5	- 3E-4
54	Xenon-120 ²	Submersion ¹	-	-	1E-5	4E-8	-	-

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
54	Xenon-121 ²	Submersion ¹	-	-	2E-6	1E-8	-	-
54	Xenon-122	Submersion ¹	-	-	7E-5	3E-7	-	-
54	Xenon-123	Submersion ¹	-	-	6E-6	3E-8	-	-
54	Xenon-125	Submersion ¹	-	-	2E-5	7E-8	-	-
54	Xenon-127	Submersion ¹	-	-	1E-5	6E-8	-	-
54	Xenon-129m	Submersion ¹	-	-	2E-4	9E-7	-	-
54	Xenon-131m	Submersion ¹	-	-	4E-4	2E-6	-	-
54	Xenon-133m	Submersion ¹	-	-	1E-4	6E-7	-	-
54	Xenon-133	Submersion ¹	-	-	1E-4	5E-7	-	-
54	Xenon-135m ²	Submersion ¹	-	-	9E-6	4E-8	-	-
54	Xenon-135	Submersion ¹	-	-	1E-5	7E-8	-	-
54	Xenon-138 ²	Submersion ¹	-	-	4E-6	2E-8	-	-
55	Cesium-125 ²	D, all compounds	5E+4 St wall (9E+4)	1E+5	6E-5	2E-7	-	-
			-	-	-	-	1E-3	1E-2
55	Cesium-127	D, all compounds	6E+4	9E+4	4E-5	1E-7	9E-4	9E-3
55	Cesium-129	D, all compounds	2E+4	3E+4	1E-5	5E-8	3E-4	3E-3
55	Cesium-130 ²	D, all compounds	6E+4 St wall (1E+5)	2E+5	8E-5	3E-7	-	-
			-	-	-	-	1E-3	1E-2
55	Cesium-131	D, all compounds	2E+4	3E+4	1E-5	4E-8	3E-4	3E-3
55	Cesium-132	D, all compounds	3E+3	4E+3	2E-6	6E-9	4E-5	4E-4
55	Cesium-134m	D, all compounds	1E+5 St wall (1E+5)	1E+5	6E-5	2E-7	-	-
			-	-	-	-	2E-3	2E-2
55	Cesium-134	D, all compounds	7E+1	1E+2	4E-8	2E-10	9E-7	9E-6
55	Cesium-135m ²	D, all compounds	1E+5	2E+5	8E-5	3E-7	1E-3	1E-2
55	Cesium-135	D, all compounds	7E+2	1E+3	5E-7	2E-9	1E-5	1E-4
55	Cesium-136	D, all compounds	4E+2	7E+2	3E-7	9E-10	6E-6	6E-5
55	Cesium-137	D, all compounds	1E+2	2E+2	6E-8	2E-10	1E-6	1E-5
55	Cesium-138 ²	D, all compounds	2E+4 St wall (3E+4)	6E+4	2E-5	8E-8	-	-
			-	-	-	-	4E-4	4E-3
56	Barium-126 ²	D, all compounds	6E+3	2E+4	6E-6	2E-8	8E-5	8E-4
56	Barium-128	D, all compounds	5E+2	2E+3	7E-7	2E-9	7E-6	7E-5

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
56	Barium-131m ²	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 ²	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 ²	D, all compounds	2E+4	7E+4	3E-5	1E-7	3E-4	3E-3
56	Barium-142 ²	D, all compounds	5E+4	1E+5	6E-5	2E-7	7E-4	7E-3
57	Lanthanum-131 ²	D, all compounds except those given for W, 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 -
57	Lanthanum-137	D, see ¹³¹ La W, see ¹³¹ La	1E+4 - - -	6E+1 Liver (7E+1) 3E+2 Liver (3E+2)	3E-8 - 1E-7 -	- 1E-10 - 4E-10	2E-4 - - -	2E-3 - - -
57	Lanthanum-138	D, see ¹³¹ La W, see ¹³¹ La	9E+2 -	4E+0 1E+1	1E-9 6E-9	5E-12 2E-11	1E-5 -	1E-4 -
57	Lanthanum-140	D, see ¹³¹ La W, see ¹³¹ La	6E+2 -	1E+3 1E+3	6E-7 5E-7	2E-9 2E-9	9E-6 -	9E-5 -
57	Lanthanum-141	D, see ¹³¹ La W, see ¹³¹ La	4E+3 -	9E+3 1E+4	4E-6 5E-6	1E-8 2E-8	5E-5 -	5E-4 -
57	Lanthanum-142 ²	D, see ¹³¹ La W, see ¹³¹ La	8E+3 -	2E+4 3E+4	9E-6 1E-5	3E-8 5E-8	1E-4 -	1E-3 -
57	Lanthanum-143 ²	D, see ¹³¹ La W, see ¹³¹ La	4E+4 St wall (4E+4) -	1E+5 - 9E+4	4E-5 - 4E-5	1E-7 - 1E-7	- 5E-4 -	- 5E-3 -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
58	Cerium-134	W, all compounds except those given for Y Y, oxides, hydroxides, and fluorides	5E+2 LLI wall (6E+2) -	7E+2 - 7E+2	3E-7 - 3E-7	1E-9 - 9E-10	- 8E-6 -	- 8E-5 -
58	Cerium-135	W, see ¹³⁴ Ce Y, see ¹³⁴ Ce	2E+3 -	4E+3 4E+3	2E-6 1E-6	5E-9 5E-9	2E-5 -	2E-4 -
58	Cerium-137m	W, see ¹³⁴ Ce Y, see ¹³⁴ Ce	2E+3 LLI wall (2E+3) -	4E+3 - 4E+3	2E-6 - 2E-6	6E-9 - 5E-9	- 3E-5 -	- 3E-4 -
58	Cerium-137	W, see ¹³⁴ Ce Y, see ¹³⁴ Ce	5E+4 -	1E+5 1E+5	6E-5 5E-5	2E-7 2E-7	7E-4 -	7E-3 -
58	Cerium-139	W, see ¹³⁴ Ce Y, see ¹³⁴ Ce	5E+3 -	8E+2 7E+2	3E-7 3E-7	1E-9 9E-10	7E-5 -	7E-4 -
58	Cerium-141	W, see ¹³⁴ Ce Y, see ¹³⁴ Ce	2E+3 LLI wall (2E+3) -	7E+2 - 6E+2	3E-7 - 2E-7	1E-9 - 8E-10	- 3E-5 -	- 3E-4 -
58	Cerium-143	W, see ¹³⁴ Ce Y, see ¹³⁴ Ce	1E+3 LLI wall (1E+3) -	2E+3 - 2E+3	8E-7 - 7E-7	3E-9 - 2E-9	- 2E-5 -	- 2E-4 -
58	Cerium-144	W, see ¹³⁴ Ce Y, see ¹³⁴ Ce	2E+2 LLI wall (3E+2) -	3E+1 - 1E+1	1E-8 - 6E-9	4E-11 - 2E-11	- 3E-6 -	- 3E-5 -
59	Praseodymium-136 ²	W, all compounds except those given for Y Y, oxides, hydroxides, carbides, and fluorides	5E+4 St wall (7E+4) -	2E+5 - 2E+5	1E-4 - 9E-5	3E-7 - 3E-7	- 1E-3 -	- 1E-2 -
59	Praseodymium-137 ²	W, see ¹³⁶ Pr Y, see ¹³⁶ Pr	4E+4 -	2E+5 1E+5	6E-5 6E-5	2E-7 2E-7	5E-4 -	5E-3 -
59	Praseodymium-138m	W, see ¹³⁶ Pr Y, see ¹³⁶ Pr	1E+4 -	5E+4 4E+4	2E-5 2E-5	8E-8 6E-8	1E-4 -	1E-3 -
59	Praseodymium-139	W, see ¹³⁶ Pr Y, see ¹³⁶ Pr	4E+4 -	1E+5 1E+5	5E-5 5E-5	2E-7 2E-7	6E-4 -	6E-3 -
59	Praseodymium-142m ²	W, see ¹³⁶ Pr Y, see ¹³⁶ Pr	8E+4 -	2E+5 1E+5	7E-5 6E-5	2E-7 2E-7	1E-3 -	1E-2 -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
59	Praseodymium-142	W, see ¹³⁶ Pr Y, see ¹³⁶ Pr	1E+3 -	2E+3 2E+3	9E-7 8E-7	3E-9 3E-9	1E-5 -	1E-4 -
59	Praseodymium-143	W, see ¹³⁶ Pr Y, see ¹³⁶ Pr	9E+2 LLI wall (1E+3) -	8E+2 - 7E+2	3E-7 - 3E-7	1E-9 - 9E-10	- 2E-5 -	- 2E-4 -
59	Praseodymium-144 ²	W, see ¹³⁶ Pr Y, see ¹³⁶ Pr	3E+4 St wall (4E+4) -	1E+5 - 1E+5	5E-5 - 5E-5	2E-7 - 2E-7	- 6E-4 -	- 6E-3 -
59	Praseodymium-145	W, see ¹³⁶ Pr Y, see ¹³⁶ Pr	3E+3 -	9E+3 8E+3	4E-6 3E-6	1E-8 1E-8	4E-5 -	4E-4 -
59	Praseodymium-147 ²	W, see ¹³⁶ Pr Y, see ¹³⁶ Pr	5E+4 St wall (8E+4) -	2E+5 - 2E+5	8E-5 - 8E-5	3E-7 - 3E-7	- 1E-3 -	- 1E-2 -
60	Neodymium-144 ²	W, all compounds except those given for Y Y, oxides, hydroxides, carbides, and fluorides	1E+4 -	6E+4 5E+4	2E-5 2E-5	8E-8 8E-8	2E-4 -	2E-3 -
60	Neodymium-138	W, see ¹³⁶ Nd Y, see ¹³⁶ Nd	2E+3 -	6E+3 5E+3	3E-6 2E-6	9E-9 7E-9	3E-5 -	3E-4 -
60	Neodymium-139m	W, see ¹³⁶ Nd Y, see ¹³⁶ Nd	5E+3 -	2E+4 1E+4	7E-6 6E-6	2E-8 2E-8	7E-5 -	7E-4 -
60	Neodymium-139 ²	W, see ¹³⁶ Nd Y, see ¹³⁶ Nd	9E+4 -	3E+5 3E+5	1E-4 1E-4	5E-7 4E-7	1E-3 -	1E-2 -
60	Neodymium-141	W, see ¹³⁶ Nd Y, see ¹³⁶ Nd	2E+5 -	7E+5 6E+5	3E-4 3E-4	1E-6 9E-7	2E-3 -	2E-2 -
60	Neodymium-147	W, see ¹³⁶ Nd Y, see ¹³⁶ Nd	1E+3 LLI wall (1E+3) -	9E+2 - 8E+2	4E-7 - 4E-7	1E-9 - 1E-9	- 2E-5 -	- 2E-4 -
60	Neodymium-149 ²	W, see ¹³⁶ Nd Y, see ¹³⁶ Nd	1E+4 -	3E+4 2E+4	1E-5 1E-5	4E-8 3E-8	1E-4 -	1E-3 -
60	Neodymium-151 ²	W, see ¹³⁶ Nd Y, see ¹³⁶ Nd	7E+4 -	2E+5 2E+5	8E-5 8E-5	3E-7 3E-7	9E-4 -	9E-3 -
61	Promethium-141 ²	W, all compounds except those for Y Y, oxides, hydroxides, carbides, and fluorides	5E+4 St wall (6E+4) -	2E+5 - 2E+5	8E-5 - 7E-5	3E-7 - 2E-7	- 8E-4 -	- 8E-3 -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
61	Promethium-143	W, see ¹⁴¹ Pm Y, see ¹⁴¹ Pm	5E+3 -	6E+2 7E+2	2E-7 3E-7	8E-10 1E-9	7E-5 -	7E-4 -
61	Promethium-144	W, see ¹⁴¹ Pm Y, see ¹⁴¹ Pm	1E+3 -	1E+2 1E+2	5E-8 5E-8	2E-10 2E-10	2E-5 -	2E-4 -
61	Promethium-145	W, see ¹⁴¹ Pm Y, see ¹⁴¹ Pm	1E+4 -	2E+2 Bone surf (2E+2) 2E+2	7E-8 - 8E-8	- 3E-10 3E-10	1E-4 - -	1E-3 - -
61	Promethium-146	W, see ¹⁴¹ Pm Y, see ¹⁴¹ Pm	2E+3 -	5E+1 4E+1	2E-8 2E-8	7E-11 6E-11	2E-5 -	2E-4 -
61	Promethium-147	W, see ¹⁴¹ Pm Y, see ¹⁴¹ Pm	4E+3 LLI wall (5E+3) -	1E+2 Bone surf (2E+2) 1E+2	5E-8 - 6E-8	- 3E-10 2E-10	- 7E-5 -	- 7E-4 -
61	Promethium-148m	W, see ¹⁴¹ Pm Y, see ¹⁴¹ Pm	7E+2 -	3E+2 3E+2	1E-7 1E-7	4E-10 5E-10	1E-5 -	1E-4 -
61	Promethium-148	W, see ¹⁴¹ Pm Y, see ¹⁴¹ Pm	4E+2 LLI wall (5E+2) -	5E+2 - 5E+2	2E-7 - 2E-7	8E-10 - 7E-10	- 7E-6 -	- 7E-5 -
61	Promethium-149	W, see ¹⁴¹ Pm Y, see ¹⁴¹ Pm	1E+3 LLI wall (1E+3) -	2E+3 - 2E+3	8E-7 - 8E-7	3E-9 - 2E-9	- 2E-5 -	- 2E-4 -
61	Promethium-150	W, see ¹⁴¹ Pm Y, see ¹⁴¹ Pm	5E+3 -	2E+4 2E+4	8E-6 7E-6	3E-8 2E-8	7E-5 -	7E-4 -
61	Promethium-151	W, see ¹⁴¹ Pm Y, see ¹⁴¹ Pm	2E+3 -	4E+3 3E+3	1E-6 1E-6	5E-9 4E-9	2E-5 -	2E-4 -
62	Samarium-141m ²	W, all compounds	3E+4	1E+5	4E-5	1E-7	4E-4	4E-3
62	Samarium-141 ²	W, all compounds	5E+4 St wall (6E+4)	2E+5 -	8E-5 -	2E-7 -	- 8E-4	- 8E-3
62	Samarium-142 ²	W, all compounds	8E+3	3E+4	1E-5	4E-8	1E-4	1E-3
62	Samarium-145	W, all compounds	6E+3	5E+2	2E-7	7E-10	8E-5	8E-4
62	Samarium-146	W, all compounds	1E+1 Bone surf (3E+1)	4E-2 Bone surf (6E-2)	1E-11 -	- 9E-14	- 3E-7	- 3E-6
62	Samarium-147	W, all compounds	2E+1 Bone surf (3E+1)	4E-2 Bone surf (7E-2)	2E-11 -	- 1E-13	- 4E-7	- 4E-6

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
62	Samarium-151	W, all compounds	1E+4 LLI wall (1E+4)	1E+2 Bone surf (2E+2)	4E-8 -	- 2E-10	- 2E-4	- 2E-3
62	Samarium-153	W, all compounds	2E+3 LLI wall (2E+3)	3E+3 -	1E-6 -	4E-9 -	- 3E-5	- 3E-4
62	Samarium-155 ²	W, all compounds	6E+4 St wall (8E+4)	2E+5 -	9E-5 -	3E-7 -	- 1E-3	- 1E-2
62	Samarium-156	W, all compounds	5E+3	9E+3	4E-6	1E-8	7E-5	7E-4
63	Europium-145	W, all compounds	2E+3	2E+3	8E-7	3E-9	2E-5	2E-4
63	Europium-146	W, all compounds	1E+3	1E+3	5E-7	2E-9	1E-5	1E-4
63	Europium-147	W, all compounds	3E+3	2E+3	7E-7	2E-9	4E-5	4E-4
63	Europium-148	W, all compounds	1E+3	4E+2	1E-7	5E-10	1E-5	1E-4
63	Europium-149	W, all compounds	1E+4	3E+3	1E-6	4E-9	2E-4	2E-3
63	Europium-150 (12.62 h)	W, all compounds	3E+3	8E+3	4E-6	1E-8	4E-5	4E-4
63	Europium-150 (34.2 y)	W, all compounds	8E+2	2E+1	8E-9	3E-11	1E-5	1E-4
63	Europium-152m	W, all compounds	3E+3	6E+3	3E-6	9E-9	4E-5	4E-4
63	Europium-152	W, all compounds	8E+2	2E+1	1E-8	3E-11	1E-5	1E-4
63	Europium-154	W, all compounds	5E+2	2E+1	8E-9	3E-11	7E-6	7E-5
63	Europium-155	W, all compounds	4E+3	9E+1 Bone surf (1E+2)	4E-8 -	- 2E-10	5E-5 -	5E-4 -
63	Europium-156	W, all compounds	6E+2	5E+2	2E-7	6E-10	8E-6	8E-5
63	Europium-157	W, all compounds	2E+3	5E+3	2E-6	7E-9	3E-5	3E-4
63	Europium-158 ²	W, all compounds	2E+4	6E+4	2E-5	8E-8	3E-4	3E-3
64	Gadolinium-145 ²	D, all compounds except those given for W W, oxides, hydroxides, and fluorides	5E+4 St wall (5E+4) -	2E+5 2E+5	6E-5 7E-5	2E-7 2E-7	- 6E-4 -	- 6E-3 -
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 -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
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 -
64	Gadolinium-148	D, see ¹⁴⁵ Gd W, see ¹⁴⁵ Gd	1E+1 Bone surf (2E+1) - -	8E+3 Bone surf (2E-2) 3E-2 Bone surf (6E-2)	3E-12 - 1E-11 -	- 2E-14 - 8E-14	- 3E-7 - -	- 3E-6 - -
64	Gadolinium-149	D, see ¹⁴⁵ Gd W, see ¹⁴⁵ Gd	3E+3 -	2E+3 2E+3	9E-7 1E-6	3E-9 3E-9	4E-5 -	4E-4 -
64	Gadolinium-151	D, see ¹⁴⁵ Gd W, see ¹⁴⁵ Gd	6E+3 - -	4E+2 Bone surf (6E+2) 1E+3	2E-7 - 5E-7	- 9E-10 2E-9	9E-5 - -	9E-4 - -
64	Gadolinium-152	D, see ¹⁴⁵ Gd W, see ¹⁴⁵ Gd	2E+1 Bone surf (3E+1) - -	1E-2 Bone surf (2E-2) 4E-2 Bone surf (8E-2)	4E-12 - 2E-11 -	- 3E-14 - 1E-13	- 4E-7 - -	- 4E-6 - -
64	Gadolinium-153	D, see ¹⁴⁵ Gd W, see ¹⁴⁵ Gd	5E+3 - -	1E+2 Bone surf (2E+2) 6E+2	6E-8 - 2E-7	- 3E-10 8E-10	6E-5 - -	6E-4 - -
64	Gadolinium-159	D, see ¹⁴⁵ Gd W, see ¹⁴⁵ Gd	3E+3 -	8E+3 6E+3	3E-6 2E-6	1E-8 8E-9	4E-5 -	4E-4 -
65	Terbium-147 ²	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

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/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 ²	W, all compounds	4E+4	2E+5	6E-5	2E-7	6E-4	6E-3
67	Holmium-157 ²	W, all compounds	3E+5	1E+6	6E-4	2E-6	4E-3	4E-2
67	Holmium-159 ²	W, all compounds	2E+5	1E+6	4E-4	1E-6	3E-3	3E-2
67	Holmium-161	W, all compounds	1E+5	4E+5	2E-4	6E-7	1E-3	1E-2
67	Holmium-162m ²	W, all compounds	5E+4	3E+5	1E-4	4E-7	7E-4	7E-3
67	Holmium-162 ²	W, all compounds	5E+5 St wall (8E+5)	2E+6 -	1E-3 -	3E-6 -	- 1E-2	- 1E-1
67	Holmium-164m ²	W, all compounds	1E+5	3E+5	1E-4	4E-7	1E-3	1E-2
67	Holmium-164 ²	W, all compounds	2E+5 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
67	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

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
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+2)	1E+3 -	6E-7 -	2E-9 -	- 2E-5	- 2E-4
69	Thulium-162 ²	W, all compounds	7E+4 St wall (7E+4)	3E+5 -	1E-4 -	4E-7 -	- 1E-3	- 1E-2
69	Thulium-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 ²	W, all compounds	7E+4 St wall (9E+4)	3E+5 -	1E-4 -	4E-7 -	- 1E-3	- 1E-2
70	Ytterbium-162 ²	W, all compounds except those given for Y, 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	9E-7 8E-7	3E-9 3E-9	2E-5 -	2E-4 -
70	Ytterbium-167 ²	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 -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
70	Ytterbium-177 ²	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 ²	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 -
71	Lutetium-176	W, see ¹⁶⁹ Lu Y, see ¹⁶⁹ Lu	7E+2 -	5E+0 Bone surf (1E+1) 8E+0	2E-9 - 3E-9	- 2E-11 1E-11	1E-5 - -	1E-4 - -
71	Lutetium-177m	W, see ¹⁶⁹ Lu Y, see ¹⁶⁹ Lu	7E+2 -	1E+2 Bone surf (1E+2) 8E+1	5E-8 - 3E-8	- 2E-10 1E-10	1E-5 - -	1E-4 - -
71	Lutetium-177	W, see ¹⁶⁹ Lu Y, see ¹⁶⁹ Lu	2E+3 LLI wall (3E+3) -	2E+3 - 2E+3	9E-7 - 9E-7	3E-9 - 3E-9	- 4E-5 -	- 4E-4 -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
71	Lutetium-178m ²	W, see ¹⁶⁹ Lu Y, see ¹⁶⁹ Lu	5E+4 St. wall (6E+4) -	2E+5 - 2E+5	8E-5 - 7E-5	3E-7 - 2E-7	- 8E-4 -	- 8E-3 -
71	Lutetium-178 ²	W, see ¹⁶⁹ Lu Y, see ¹⁶⁹ Lu	4E+4 St wall (4E+4) -	1E+5 - 1E+5	5E-5 - 5E-5	2E-7 - 2E-7	- 6E-4 -	- 6E-3 -
71	Lutetium-179	W, see ¹⁶⁹ Lu Y, see ¹⁶⁹ Lu	6E+3 -	2E+4 2E+4	8E-6 6E-6	3E-8 3E-8	9E-5 -	9E-4 -
72	Hafnium-170	D, all compounds except those given for W W, oxides, hydroxides, carbides, and nitrates	3E+3 -	6E+3 5E+3	2E-6 2E-6	8E-9 6E-9	4E-5 -	4E-4 -
72	Hafnium-172	D, see ¹⁷⁰ Hf W, see ¹⁷⁰ Hf	1E+3 - -	9E+0 Bone surf (2E+1 4E+1 Bone surf (6E+1	4E-9 - 2E-8 -	- 3E-11 - 8E-11	2E-5 - - -	2E-4 - - -
72	Hafnium-173	D, see ¹⁷⁰ Hf W, see ¹⁷⁰ Hf	5E+3 -	1E+4 1E+4	5E-6 5E-6	2E-8 2E-8	7E-5 -	7E-4 -
72	Hafnium-175	D, see ¹⁷⁰ Hf W, see ¹⁷⁰ Hf	3E+3 -	9E+2 Bone surf (1E+3) 1E+3	4E-7 - 5E-7	- 1E-9 2E-9	4E-5 - -	4E-4 - -
72	Hafnium-177m ²	D, see ¹⁷⁰ Hf W, see ¹⁷⁰ Hf	2E+4 -	6E+4 9E+4	2E-5 4E-5	8E-8 1E-7	3E-4 -	3E-3 -
72	Hafnium-178m	D, see ¹⁷⁰ Hf W, see ¹⁷⁰ Hf	3E+2 - -	1E+0 Bone surf (2E+0) 5E+0 Bone surf (9E+0)	5E-10 - 2E-9 -	- 3E-12 - 1E-11	3E-6 - - -	3E-5 - - -
72	Hafnium-179m	D, see ¹⁷⁰ Hf W, see ¹⁷⁰ Hf	1E+3 - -	3E+2 Bone surf (6E+2) 6E+2	1E-7 - 3E-7	- 8E-10 8E-10	1E-5 - -	1E-4 - -
72	Hafnium-180m	D, see ¹⁷⁰ Hf W, see ¹⁷⁰ Hf	7E+3 -	2E+4 3E+4	9E-6 1E-5	3E-8 4E-8	1E-4 -	1E-3 -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
72	Hafnium-181	D, see ¹⁷⁰ Hf W, see ¹⁷⁰ Hf	1E+3 -	2E+2 Bone surf (4E+2) 4E+2	7E-8 2E-7	- 6E-10 6E-10	2E-5 -	2E-4 -
72	Hafnium-182m ²	D, see ¹⁷⁰ Hf W, see ¹⁷⁰ Hf	4E+4 -	9E+4 1E+5	4E-5 6E-5	1E-7 2E-7	5E-4 -	5E-3 -
72	Hafnium-182	D, see ¹⁷⁰ Hf W, see ¹⁷⁰ Hf	2E+2 Bone surf (4E+2) -	8E-1 Bone surf (2E+0) 3E+0 Bone surf (7E+0)	3E-10 1E-9	- 2E-12 1E-11	- 5E-6 -	- 5E-5 -
72	Hafnium-183 ²	D, see ¹⁷⁰ Hf W, see ¹⁷⁰ Hf	2E+4 -	5E+4 6E+4	2E-5 2E-5	6E-8 8E-8	3E-4 -	3E-3 -
72	Hafnium-184	D, see ¹⁷⁰ Hf W, see ¹⁷⁰ Hf	2E+3 -	8E+3 6E+3	3E-6 3E-6	1E-8 9E-9	3E-5 -	3E-4 -
73	Tantalum-172 ²	W, all compounds except those given for Y Y, elemental Ta, oxides, hydroxides, halides, carbides, nitrates, and nitrides	4E+4 -	1E+5 1E+5	5E-5 4E-5	2E-7 1E-7	5E-4 -	5E-3 -
73	Tantalum-173	W, see ¹⁷² Ta Y, see ¹⁷² Ta	7E+3 -	2E+4 2E+4	8E-6 7E-6	3E-8 2E-8	9E-5 -	9E-4 -
73	Tantalum-174 ²	W, see ¹⁷² Ta Y, see ¹⁷² Ta	3E+4 -	1E+5 9E+4	4E-5 4E-5	1E-7 1E-7	4E-4 -	4E-3 -
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 -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
73	Tantalum-182m ²	W, see ¹⁷² Ta Y, see ¹⁷² Ta	2E+5 St wall (2E+5) -	5E+5 - 4E+5	2E-4 - 2E-4	8E-7 - 6E-7	- 3E-3 -	- 3E-2 -
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 Y, see ¹⁷² Ta	9E+2 LLI wall (1E+3) -	1E+3 - 1E+3	5E-7 - 4E-7	2E-9 - 1E-9	- 2E-5 -	- 2E-4 -
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 ²	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 ²	W, see ¹⁷² Ta Y, see ¹⁷² Ta	5E+4 St wall (7E+4) -	2E+5 - 2E+5	1E-4 - 9E-5	3E-7 - 3E-7	- 1E-3 -	- 1E-2 -
74	Tungsten-176	D, all compounds	1E+4	5E+4	2E-5	7E-8	1E-4	1E-3
74	Tungsten-177	D, all compounds	2E+4	9E+4	4E-5	1E-7	3E-4	3E-3
74	Tungsten-178	D, all compounds	5E+3	2E+4	8E-6	3E-8	7E-5	7E-4
74	Tungsten-179 ²	D, all compounds	5E+5	2E+6	7E-4	2E-6	7E-3	7E-2
74	Tungsten-181	D, all compounds	2E+4	3E+4	1E-5	5E-8	2E-4	2E-3
74	Tungsten-185	D, all compounds	2E+3 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 ²	D, all compounds except those given for W W, oxides, hydroxides, and nitrates	9E+4 St wall (1E+5) -	3E+5 - 4E+5	1E-4 - 1E-4	4E-7 - 5E-7	- 2E-3 -	- 2E-2 -
75	Rhenium-178 ²	D, see ¹⁷⁷ Re W, see ¹⁷⁷ Re	7E+4 St wall (1E+5) -	3E+5 - 3E+5	1E-4 - 1E-4	4E-7 - 4E-7	- 1E-3 -	- 1E-2 -
75	Rhenium-181	D, see ¹⁷⁷ Re W, see ¹⁷⁷ Re	5E+3 -	9E+3 9E+3	4E-6 4E-6	1E-8 1E-8	7E-5 -	7E-4 -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
75	Rhenium-182 (12.7 h)	D, see ¹⁷⁷ Re W, see ¹⁷⁷ Re	7E+3 -	1E+4 2E+4	5E-6 6E-6	2E-8 2E-8	9E-5 -	9E-4 -
75	Rhenium-182 (64.0 h)	D, see ¹⁷⁷ Re W, see ¹⁷⁷ Re	1E+3 -	2E+3 2E+3	1E-6 9E-7	3E-9 3E-9	2E-5 -	2E-4 -
75	Rhenium-184m	D, see ¹⁷⁷ Re W, see ¹⁷⁷ Re	2E+3 -	3E+3 4E+2	1E-6 2E-7	4E-9 6E-10	3E-5 -	3E-4 -
75	Rhenium-184	D, see ¹⁷⁷ Re W, see ¹⁷⁷ Re	2E+3 -	4E+3 1E+3	1E-6 6E-7	5E-9 2E-9	3E-5 -	3E-4 -
75	Rhenium-186m	D, see ¹⁷⁷ Re W, see ¹⁷⁷ Re	1E+3 St wall (2E+3) -	2E+3 St wall (2E+3) 2E+2	7E-7 - 6E-8	- 3E-9 2E-10	- 2E-5 -	- 2E-4 -
75	Rhenium-186	D, see ¹⁷⁷ Re W, see ¹⁷⁷ Re	2E+3 -	3E+3 2E+3	1E-6 7E-7	4E-9 2E-9	3E-5 -	3E-4 -
75	Rhenium-187	D, see ¹⁷⁷ Re W, see ¹⁷⁷ Re	6E+5 -	8E+5 St wall (9E+5) 1E+5	4E-4 - 4E-5	- 1E-6 1E-7	8E-3 - -	8E-2 - -
75	Rhenium-188m ²	D, see ¹⁷⁷ Re W, see ¹⁷⁷ Re	8E+4 -	1E+5 1E+5	6E-5 6E-5	2E-7 2E-7	1E-3 -	1E-2 -
75	Rhenium-188	D, see ¹⁷⁷ Re W, see ¹⁷⁷ Re	2E+3 -	3E+3 3E+3	1E-6 1E-6	4E-9 4E-9	2E-5 -	2E-4 -
75	Rhenium-189	D, see ¹⁷⁷ Re W, see ¹⁷⁷ Re	3E+3 -	5E+3 4E+3	2E-6 2E-6	7E-9 6E-9	4E-5 -	4E-4 -
76	Osmium-180 ²	D, all compounds except those given for W and Y W, halides and nitrates Y, oxides and hydroxides	1E+5 -	4E+5 5E+5 5E+5	2E-4 2E-4 2E-4	5E-7 7E-7 6E-7	1E-3 - -	1E-2 - -
76	Osmium-181 ²	D, see ¹⁸⁰ Os W, see ¹⁸⁰ Os Y, see ¹⁸⁰ Os	1E+4 - -	4E+4 5E+4 4E+4	2E-5 2E-5 2E-5	6E-8 6E-8 6E-8	2E-4 - -	2E-3 - -
76	Osmium-182	D, see ¹⁸⁰ Os W, see ¹⁸⁰ Os Y, see ¹⁸⁰ Os	2E+3 - -	6E+3 4E+3 4E+3	2E-6 2E-6 2E-6	8E-9 6E-9 6E-9	3E-5 - -	3E-4 - -
76	Osmium-185	D, see ¹⁸⁰ Os W, see ¹⁸⁰ Os Y, see ¹⁸⁰ Os	2E+3 - -	5E+2 8E+2 8E+2	2E-7 3E-7 3E-7	7E-10 1E-9 1E-9	3E-5 - -	3E-4 - -
76	Osmium-189m	D, see ¹⁸⁰ Os W, see ¹⁸⁰ Os Y, see ¹⁸⁰ Os	8E+4 - -	2E+5 2E+5 2E+5	1E-4 9E-5 7E-5	3E-7 3E-7 2E-7	1E-3 - -	1E-2 - -
76	Osmium-191m	D, see ¹⁸⁰ Os W, see ¹⁸⁰ Os Y, see ¹⁸⁰ Os	1E+4 - -	3E+4 2E+4 2E+4	1E-5 8E-6 7E-6	4E-8 3E-8 2E-8	2E-4 - -	2E-3 - -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
76	Osmium-191	D, see ¹⁸⁰ Os W, see ¹⁸⁰ Os Y, see ¹⁸⁰ Os	2E+3 LLI wall (3E+3) - -	2E+3 - 2E+3 1E+3	9E-7 - 7E-7 6E-7	3E-9 - 2E-9 2E-9	- 3E-5 - -	- 3E-4 - -
76	Osmium-193	D, see ¹⁸⁰ Os W, see ¹⁸⁰ Os Y, see ¹⁸⁰ Os	2E+3 LLI wall (2E+3) - -	5E+3 - 3E+3 3E+3	2E-6 - 1E-6 1E-6	6E-9 - 4E-9 4E-9	- 2E-5 - -	- 2E-4 - -
76	Osmium-194	D, see ¹⁸⁰ Os W, see ¹⁸⁰ Os Y, see ¹⁸⁰ Os	4E+2 LLI wall (6E+2) - -	4E+1 - 6E+1 8E+0	2E-8 - 2E-8 3E-9	6E-11 - 8E-11 1E-11	- 8E-6 - -	- 8E-5 - -
77	Iridium-182 ²	D, all compounds except those given for W and Y W, halides, nitrates, and metallic iridium Y, oxides and hydroxides	4E+4 St wall (4E+4) - -	1E+5 - 2E+5 1E+5	6E-5 - 6E-5 5E-5	2E-7 - 2E-7 2E-7	- 6E-4 - -	- 6E-3 - -
77	Iridium-184	D, see ¹⁸² Ir W, see ¹⁸² Ir Y, see ¹⁸² Ir	8E+3 - -	2E+4 3E+4 3E+4	1E-5 1E-5 1E-5	3E-8 5E-8 4E-8	1E-4 - -	1E-3 - -
77	Iridium-185	D, see ¹⁸² Ir W, see ¹⁸² Ir Y, see ¹⁸² Ir	5E+3 - -	1E+4 1E+4 1E+4	5E-6 5E-6 4E-6	2E-8 2E-8 1E-8	7E-5 - -	7E-4 - -
77	Iridium-186	D, see ¹⁸² Ir W, see ¹⁸² Ir Y, see ¹⁸² Ir	2E+3 - -	8E+3 6E+3 6E+3	3E-6 3E-6 2E-6	1E-8 9E-9 8E-9	3E-5 - -	3E-4 - -
77	Iridium-187	D, see ¹⁸² Ir W, see ¹⁸² Ir Y, see ¹⁸² Ir	1E+4 - -	3E+4 3E+4 3E+4	1E-5 1E-5 1E-5	5E-8 4E-8 4E-8	1E-4 - -	1E-3 - -
77	Iridium-188	D, see ¹⁸² Ir W, see ¹⁸² Ir Y, see ¹⁸² Ir	2E+3 - -	5E+3 4E+3 3E+3	2E-6 1E-6 1E-6	6E-9 5E-9 5E-9	3E-5 - -	3E-4 - -
77	Iridium-189	D, see ¹⁸² Ir W, see ¹⁸² Ir Y, see ¹⁸² Ir	5E+3 LLI wall (5E+3) - -	5E+3 - 4E+3 4E+3	2E-6 - 2E-6 1E-6	7E-9 - 5E-9 5E-9	- 7E-5 - -	- 7E-4 - -
77	Iridium-190m ²	D, see ¹⁸² Ir W, see ¹⁸² Ir Y, see ¹⁸² Ir	2E+5 - -	2E+5 2E+5 2E+5	8E-5 9E-5 8E-5	3E-7 3E-7 3E-7	2E-3 - -	2E-2 - -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average
				ALI (μCi)	DAC (μCi/ml)			Concentration (μCi/ml)
77	Iridium-190	D, see ¹⁸² Ir W, see ¹⁸² Ir Y, see ¹⁸² Ir	1E+3 - -	9E+2 1E+3 9E+2	4E-7 4E-7 4E-7	1E-9 1E-9 1E-9	1E-5 - -	1E-4 - -
77	Iridium-192m	D, see ¹⁸² Ir W, see ¹⁸² Ir Y, see ¹⁸² Ir	3E+3 - -	9E+1 2E+2 2E+1	4E-8 9E-8 6E-9	1E-10 3E-10 2E-11	4E-5 - -	4E-4 - -
77	Iridium-192	D, see ¹⁸² Ir W, see ¹⁸² Ir Y, see ¹⁸² Ir	9E+2 - -	3E+2 4E+2 2E+2	1E-7 2E-7 9E-8	4E-10 6E-10 3E-10	1E-5 - -	1E-4 - -
77	Iridium-194m	D, see ¹⁸² Ir W, see ¹⁸² Ir Y, see ¹⁸² Ir	6E+2 - -	9E+1 2E+2 1E+2	4E-8 7E-8 4E-8	1E-10 2E-10 1E-10	9E-6 - -	9E-5 - -
77	Iridium-194	D, see ¹⁸² Ir W, see ¹⁸² Ir Y, see ¹⁸² Ir	1E+3 - -	3E+3 2E+3 2E+3	1E-6 9E-7 8E-7	4E-9 3E-9 3E-9	1E-5 - -	1E-4 - -
77	Iridium-195m	D, see ¹⁸² Ir W, see ¹⁸² Ir Y, see ¹⁸² Ir	8E+3 - -	2E+4 3E+4 2E+4	1E-5 1E-5 9E-6	3E-8 4E-8 3E-8	1E-4 - -	1E-3 - -
77	Iridium-195	D, see ¹⁸² Ir W, see ¹⁸² Ir Y, see ¹⁸² Ir	1E+4 - -	4E+4 5E+4 4E+4	2E-5 2E-5 2E-5	6E-8 7E-8 6E-8	2E-4 - -	2E-3 - -
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 ²	D, all compounds	2E+4	4E+4	2E-5	6E-8	2E-4	2E-3
78	Platinum-197	D, all compounds	3E+3	1E+4	4E-6	1E-8	4E-5	4E-4
78	Platinum-199 ²	D, all compounds	5E+4	1E+5	6E-5	2E-7	7E-4	7E-3
78	Platinum-200	D, all compounds	1E+3	3E+3	1E-6	5E-9	2E-5	2E-4

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
79	Gold-193	D, all compounds except those given for W and Y W, halides and nitrates Y, oxides and hydroxides	9E+3 - -	3E+4 2E+4 2E+4	1E-5 9E-6 8E-6	4E-8 3E-8 3E-8	1E-4 - -	1E-3 - -
79	Gold-194	D, see ¹⁹³ Au W, see ¹⁹³ Au Y, see ¹⁹³ Au	3E+3 - -	8E+3 5E+3 5E+3	3E-6 2E-6 2E-6	1E-8 8E-9 7E-9	4E-5 - -	4E-4 - -
79	Gold-195	D, see ¹⁹³ Au W, see ¹⁹³ Au Y, see ¹⁹³ Au	5E+3 - -	1E+4 1E+3 4E+2	5E-6 6E-7 2E-7	2E-8 2E-9 6E-10	7E-5 - -	7E-4 - -
79	Gold-198m	D, see ¹⁹³ Au W, see ¹⁹³ Au Y, see ¹⁹³ Au	1E+3 - -	3E+3 1E+3 1E+3	1E-6 5E-7 5E-7	4E-9 2E-9 2E-9	1E-5 - -	1E-4 - -
79	Gold-198	D, see ¹⁹³ Au W, see ¹⁹³ Au Y, see ¹⁹³ Au	1E+3 - -	4E+3 2E+3 2E+3	2E-6 8E-7 7E-7	5E-9 3E-9 2E-9	2E-5 - -	2E-4 - -
79	Gold-199	D, see ¹⁹³ Au W, see ¹⁹³ Au Y, see ¹⁹³ Au	3E+3 LLI wall (3E+3) - -	9E+3 - 4E+3 4E+3	4E-6 - 2E-6 2E-6	1E-8 - 6E-9 5E-9	- 4E-5 - -	- 4E-4 - -
79	Gold-200m	D, see ¹⁹³ Au W, see ¹⁹³ Au Y, see ¹⁹³ Au	1E+3 - -	4E+3 3E+3 2E+4	1E-6 1E-6 1E-6	5E-9 4E-9 3E-9	2E-5 - -	2E-4 - -
79	Gold-200 ²	D, see ¹⁹³ Au W, see ¹⁹³ Au Y, see ¹⁹³ Au	3E+4 - -	6E+4 8E+4 7E+4	3E-5 3E-5 3E-5	9E-8 1E-7 1E-7	4E-4 - -	4E-3 - -
79	Gold-201 ²	D, see ¹⁹³ Au W, see ¹⁹³ Au Y, see ¹⁹³ Au	7E+4 St wall (9E+4) - -	2E+5 - 2E+5 2E+5	9E-5 - 1E-4 9E-5	3E-7 - 3E-7 3E-7	- 1E-3 - -	- 1E-2 - -
80	Mercury-193m	Vapor Organic D D, sulfates W, oxides, hydroxides, halides, nitrates, and sulfides	- 4E+3 3E+3 -	8E+3 1E+4 9E+3 8E+3	4E-6 5E-6 4E-6 3E-6	1E-8 2E-8 1E-8 1E-8	- 6E-5 4E-5 -	- 6E-4 4E-4 -
80	Mercury-193	Vapor Organic D D, see ^{193m} Hg W, see ^{193m} Hg	- 2E+4 2E+4 -	3E+4 6E+4 4E+4 4E+4	1E-5 3E-5 2E-5 2E-5	4E-8 9E-8 6E-8 6E-8	- 3E-4 2E-4 -	- 3E-3 2E-3 -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average
				ALI (μCi)	DAC (μCi/ml)			Concentration (μCi/ml)
80	Mercury-194	Vapor Organic D D, see ^{193m} Hg W, see ^{193m} Hg	- 2E+1 8E+2 -	3E+1 3E+1 4E+1 1E+2	1E-8 1E-8 2E-8 5E-8	4E-11 4E-11 6E-11 2E-10	- 2E-7 1E-5 -	- 2E-6 1E-4 -
80	Mercury-195m	Vapor Organic D D, see ^{193m} Hg W, see ^{193m} Hg	- 3E+3 2E+3 -	4E+3 6E+3 5E+3 4E+3	2E-6 3E-6 2E-6 2E-6	6E-9 8E-9 7E-9 5E-9	- 4E-5 3E-5 -	- 4E-4 3E-4 -
80	Mercury-195	Vapor Organic D D, see ^{193m} Hg W, see ^{193m} Hg	- 2E+4 1E+4 -	3E+4 5E+4 4E+4 3E+4	1E-5 2E-5 1E-5 1E-5	4E-8 6E-8 5E-8 5E-8	- 2E-4 2E-4 -	- 2E-3 2E-3 -
80	Mercury-197m	Vapor Organic D D, see ^{193m} Hg W, see ^{193m} Hg	- 4E+3 3E+3 -	5E+3 9E+3 7E+3 5E+3	2E-6 4E-6 3E-6 2E-6	7E-9 1E-8 1E-8 7E-9	- 5E-5 4E-5 -	- 5E-4 4E-4 -
80	Mercury-197	Vapor Organic D D, see ^{193m} Hg W, see ^{193m} Hg	- 7E+3 6E+3 -	8E+3 1E+4 1E+4 9E+3	4E-6 6E-6 5E-6 4E-6	1E-8 2E-8 2E-8 1E-8	- 9E-5 8E-5 -	- 9E-4 8E-4 -
80	Mercury-199m ²	Vapor Organic D D, see ^{193m} Hg W, see ^{193m} Hg	- 6E+4 St wall (1E+5) 6E+4 -	8E+4 2E+5 - 1E+5 2E+5	3E-5 7E-5 - 6E-5 7E-5	1E-7 2E-7 - 2E-7 2E-7	- - 1E-3 8E-4 -	- - 1E-2 8E-3 -
80	Mercury-203	Vapor Organic D D, see ^{193m} Hg W, see ^{193m} Hg	- 5E+2 2E+3 -	8E+2 8E+2 1E+3 1E+3	4E-7 3E-7 5E-7 5E-7	1E-9 1E-9 2E-9 2E-9	- 7E-6 3E-5 -	- 7E-5 3E-4 -
81	Thallium-194m ²	D, all compounds	5E+4 St wall (7E+4)	2E+5 -	6E-5 -	2E-7 -	- 1E-3	- 1E-2
81	Thallium-194 ²	D, all compounds	3E+5 St wall (3E+5)	6E+5 -	2E-4 -	8E-7 -	- 4E-3	- 4E-2
81	Thallium-195 ²	D, all compounds	6E+4	1E+5	5E-5	2E-7	9E-4	9E-3
81	Thallium-197	D, all compounds	7E+4	1E+5	5E-5	2E-7	1E-3	1E-2
81	Thallium-198m ²	D, all compounds	3E+4	5E+4	2E-5	8E-8	4E-4	4E-3
81	Thallium-198	D, all compounds	2E+4	3E+4	1E-5	5E-8	3E-4	3E-3
81	Thallium-199	D, all compounds	6E+4	8E+4	4E-5	1E-7	9E-4	9E-3
81	Thallium-200	D, all compounds	8E+3	1E+4	5E-6	2E-8	1E-4	1E-3
81	Thallium-201	D, all compounds	2E+4	2E+4	9E-6	3E-8	2E-4	2E-3
81	Thallium-202	D, all compounds	4E+3	5E+3	2E-6	7E-9	5E-5	5E-4

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
81	Thallium-204	D, all compounds	2E+3	2E+3	9E-7	3E-9	2E-5	2E-4
82	Lead-195m ²	D, all compounds	6E+4	2E+5	8E-5	3E-7	8E-4	8E-3
82	Lead-198	D, all compounds	3E+4	6E+4	3E-5	9E-8	4E-4	4E-3
82	Lead-199 ²	D, all compounds	2E+4	7E+4	3E-5	1E-7	3E-4	3E-3
82	Lead-200	D, all compounds	3E+3	6E+3	3E-6	9E-9	4E-5	4E-4
82	Lead-201	D, all compounds	7E+3	2E+4	8E-6	3E-8	1E-4	1E-3
82	Lead-202m	D, all compounds	9E+3	3E+4	1E-5	4E-8	1E-4	1E-3
82	Lead-202	D, all compounds	1E+2	5E+1	2E-8	7E-11	2E-6	2E-5
82	Lead-203	D, all compounds	5E+3	9E+3	4E-6	1E-8	7E-5	7E-4
82	Lead-205	D, all compounds	4E+3	1E+3	6E-7	2E-9	5E-5	5E-4
82	Lead-209	D, all compounds	2E+4	6E+4	2E-5	8E-8	3E-4	3E-3
82	Lead-210	D, all compounds	6E-1 Bone surf (1E+0)	2E-1 Bone surf (4E-1)	1E-10	-	-	-
					-	6E-13	1E-8	1E-7
82	Lead-211 ²	D, all compounds	1E+4	6E+2	3E-7	9E-10	2E-4	2E-3
82	Lead-212	D, all compounds	8E+1 Bone surf (1E+2)	3E+1	1E-8	5E-11	-	-
				-	-	-	2E-6	2E-5
82	Lead-214 ²	D, all compounds	9E+3	8E+2	3E-7	1E-9	1E-4	1E-3
83	Bismuth-200 ²	D, nitrates W, all other compounds	3E+4	8E+4	4E-5	1E-7	4E-4	4E-3
			-	1E+5	4E-5	1E-7	-	-
83	Bismuth-201 ²	D, see ²⁰⁰ Bi W, see ²⁰⁰ Bi	1E+4	3E+4	1E-5	4E-8	2E-4	2E-3
			-	4E+4	2E-5	5E-8	-	-
83	Bismuth-202 ²	D, see ²⁰⁰ Bi W, see ²⁰⁰ Bi	1E+4	4E+4	2E-5	6E-8	2E-4	2E-3
			-	8E+4	3E-5	1E-7	-	-
83	Bismuth-203	D, see ²⁰⁰ Bi W, see ²⁰⁰ Bi	2E+3	7E+3	3E-6	9E-9	3E-5	3E-4
			-	6E+3	3E-6	9E-9	-	-
83	Bismuth-205	D, see ²⁰⁰ Bi W, see ²⁰⁰ Bi	1E+3	3E+3	1E-6	3E-9	2E-5	2E-4
			-	1E+3	5E-7	2E-9	-	-
83	Bismuth-206	D, see ²⁰⁰ Bi W, see ²⁰⁰ Bi	6E+2	1E+3	6E-7	2E-9	9E-6	9E-5
			-	9E+2	4E-7	1E-9	-	-
83	Bismuth-207	D, see ²⁰⁰ Bi W, see ²⁰⁰ Bi	1E+3	2E+3	7E-7	2E-9	1E-5	1E-4
			-	4E+2	1E-7	5E-10	-	-
83	Bismuth-210m	D, see ²⁰⁰ Bi W, see ²⁰⁰ Bi	4E+1 Kidneys (6E+1)	5E+0 Kidneys (6E+0)	2E-9	-	-	-
			-	7E-1	-	9E-12	8E-7	8E-6
					3E-10	9E-13	-	-

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
83	Bismuth-210	D, see ²⁰⁰ Bi W, see ²⁰⁰ Bi	8E+2 - -	2E+2 Kidneys (4E+2) 3E+1	1E-7 - 1E-8	- 5E-10 4E-11	1E-5 - -	1E-4 - -
83	Bismuth-212 ²	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 ²	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 ²	D, see ²⁰⁰ Bi W, see ²⁰⁰ Bi	2E+4 St wall (2E+4) -	8E+2 - 9E-2	3E-7 - 4E-7	1E-9 - 1E-9	- 3E-4 -	- 3E-3 -
84	Polonium-203 ²	D, all compounds except those given for W W, oxides, hydroxides, and nitrates	3E+4 -	6E+4 9E+4	3E-5 4E-5	9E-8 1E-7	3E-4 -	3E-3 -
84	Polonium-205 ²	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 -
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 ²	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 ²	D, all compounds	2E+3	5E+2	2E-7	6E-10	3E-5	3E-4
87	Francium-223 ²	D, all compounds	6E+2	8E+2	3E-7	1E-9	8E-6	8E-5
88	Radium-223	W, all compounds	5E+0 Bone surf (9E+0)	7E-1 -	3E-10 -	9E-13 -	- 1E-7	- 1E-6

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
88	Radium-224	W, all compounds	8E+0 Bone surf (2E+1)	2E+0 -	7E-10 -	2E-12 -	- 2E-7	- 2E-6
88	Radium-225	W, all compounds	8E+0 Bone surf (2E+1)	7E-1 -	3E-10 -	9E-13 -	- 2E-7	- 2E-6
88	Radium-226	W, all compounds	2E+0 Bone surf (5E+0)	6E-1 -	3E-10 -	9E-13 -	- 6E-8	- 6E-7
88	Radium-227 ²	W, all compounds	2E+4 Bone surf (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
89	Actinium-224	D, all compounds except those given for W and Y W, halides and nitrates Y, oxides and hydroxides	2E+3 LLI wall (2E+3) - -	3E+1 Bone surf (4E+1) 5E+1 5E+1	1E-8 - 2E-8 2E-8	- 5E-11 7E-11 6E-11	- 3E-5 - -	- 3E-4 - -
89	Actinium-225	D, see ²²⁴ Ac W, see ²²⁴ Ac Y, see ²²⁴ Ac	5E+1 LLI wall (5E+1) - -	3E-1 Bone surf (5E-1) 6E-1 6E-1	1E-10 - 3E-10 3E-10	- 7E-13 9E-13 9E-13	- 7E-7 - -	- 7E-6 - -
89	Actinium-226	D, see ²²⁴ Ac W, see ²²⁴ Ac Y, see ²²⁴ Ac	1E+2 LLI wall (1E+2) - -	3E+0 Bone surf (4E+0) 5E+0 5E+0	1E-9 - 2E-9 2E-9	- 5E-12 7E-12 6E-12	- 2E-6 - -	- 2E-5 - -
89	Actinium-227	D, see ²²⁴ Ac W, see ²²⁴ Ac Y, see ²²⁴ Ac	2E-1 Bone surf (4E-1) - -	4E-4 Bone surf (8E-4) 2E-3 Bone surf (3E-3) 4E-3	2E-13 - 7E-13 - 2E-12	- 1E-15 - 4E-15 6E-15	- 5E-9 - - -	- 5E-8 - - -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
89	Actinium-228	D, see ²²⁴ Ac W, see ²²⁴ Ac Y, see ²²⁴ Ac	2E+3 - -	9E+0 Bone surf (2E+1) 4E+1 Bone surf (6E+1) 4E+1	4E-9 - 2E-8 - 2E-8	- 2E-11 8E-11 6E-11	3E-5 - - -	3E-4 - - -
90	Thorium-226 ²	W, all compounds except those given for Y Y, oxides and hydroxides	5E+3 St wall (5E+3) -	2E+2 - 1E+2	6E-8 - 6E-8	2E-10 - 2E-10	- 7E-5 -	- 7E-4 -
90	Thorium-227	W, see ²²⁶ Th Y, see ²²⁶ Th	1E+2 -	3E-1 3E-1	1E-10 1E-10	5E-13 5E-13	2E-6 -	2E-5 -
90	Thorium-228	W, see ²²⁶ Th Y, see ²²⁶ Th	6E+0 Bone surf (1E+1) -	1E-2 Bone surf (2E-2) 2E-2	4E-12 - 7E-12	- 3E-14 2E-14	- 2E-7 -	- 2E-6 -
90	Thorium-229	W, see ²²⁶ Th Y, see ²²⁶ Th	6E-1 Bone surf (1E+0) - -	9E-4 Bone surf (2E-3) 2E-3 Bone surf (3E-3)	4E-13 - 1E-12 -	- 3E-15 4E-15	- 2E-8 -	- 2E-7 -
90	Thorium-230	W, see ²²⁶ Th Y, see ²²⁶ Th	4E+0 Bone surf (9E+0) - -	6E-3 Bone surf (2E-2) 2E-2 Bone surf (2E-2)	3E-12 - 6E-12 -	- 2E-14 3E-14	- 1E-7 -	- 1E-6 -
90	Thorium-231	W, see ²²⁶ Th Y, see ²²⁶ Th	4E+3 -	6E+3 6E+3	3E-6 3E-6	9E-9 9E-9	5E-5 -	5E-4 -
90	Thorium-232	W, see ²²⁶ Th Y, see ²²⁶ Th	7E-1 Bone surf (2E+0) - -	1E-3 Bone surf (3E-3) 3E-3 Bone surf (4E-3)	5E-13 - 1E-12 -	- 4E-15 6E-15	- 3E-8 -	- 3E-7 -
90	Thorium-234	W, see ²²⁶ Th Y, see ²²⁶ Th	3E+2 LLI wall (4E+2) -	2E+2 - 2E+2	8E-8 - 6E-8	3E-10 - 2E-10	- 5E-6 -	- 5E-5 -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
91	Protactinium-227 ²	W, all compounds except those given for Y, oxides and hydroxides	4E+3 -	1E+2 1E+2	5E-8 4E-8	2E-10 1E-10	5E-5 -	5E-4 -
91	Protactinium-228	W, see ²²⁷ Pa Y, see ²²⁷ Pa	1E+3 -	1E+1 Bone surf (2E+1) 1E+1	5E-9 - 5E-9	- 3E-11 2E-11	2E-5 - -	2E-4 - -
91	Protactinium-230	W, see ²²⁷ Pa Y, see ²²⁷ Pa	6E+2 Bone surf (9E+2) -	5E+0 - 4E+0	2E-9 - 1E-9	7E-12 - 5E-12	- 1E-5 -	- 1E-4 -
91	Protactinium-231	W, see ²²⁷ Pa Y, see ²²⁷ Pa	2E-1 Bone surf (5E-1) - -	2E-3 Bone surf (4E-3) 4E-3 Bone surf (6E-3)	6E-13 - 2E-12 -	- 6E-15 - 8E-15	- 6E-9 - -	- 6E-8 - -
91	Protactinium-232	W, see ²²⁷ Pa Y, see ²²⁷ Pa	1E+3 - -	2E+1 Bone surf (6E+1) 6E+1 Bone surf (7E+1)	9E-9 - 2E-8 -	- 8E-11 - 1E-10	2E-5 - - -	2E-4 - - -
91	Protactinium-233	W, see ²²⁷ Pa Y, see ²²⁷ Pa	1E+3 LLI wall (2E+3) -	7E+2 - 6E+2	3E-7 - 2E-7	1E-9 - 8E-10	- 2E-5 -	- 2E-4 -
91	Protactinium-234	W, see ²²⁷ Pa Y, see ²²⁷ Pa	2E+3 -	8E+3 7E+3	3E-6 3E-6	1E-8 9E-9	3E-5 -	3E-4 -
92	Uranium-230	D, UF, UO ₂ F ₂ , UO ₂ (NO ₃) ₂ W, UO ₃ , UF ₄ , UC ₁₄ Y, UO ₂ , U ₃ O ₈	4E+0 Bone surf (6E+0) -	4E-1 Bone surf (6E-1) 4E-1 3E-1	2E-10 - 1E-10 1E-10	- 8E-13 5E-13 4E-13	- 8E-8 - -	- 8E-7 - -
92	Uranium-231	D, see ²³⁰ U W, see ²³⁰ U Y, see ²³⁰ U	5E+3 LLI wall (4E+3) -	8E+3 - 6E+3 5E+3	3E-6 - 2E-6 2E-6	1E-8 - 8E-9 6E-9	- 6E-5 -	- 6E-4 -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
92	Uranium-232	D, see ²³⁰ U W, see ²³⁰ U Y, see ²³⁰ U	2E+0 Bone surf (4E+0) - -	2E-1 Bone surf (4E-1) 4E-1 8E-3	9E-11 - 2E-10 3E-12	- 6E-13 5E-13 1E-14	- 6E-8 - -	- 6E-7 - -
92	Uranium-233	D, see ²³⁰ U W, see ²³⁰ U Y, see ²³⁰ U	1E+1 Bone surf (2E+1) - -	1E+0 Bone surf (2E+0) 7E-1 4E-2	5E-10 - 3E-10 2E-11	- 3E-12 1E-12 5E-14	- 3E-7 - -	- 3E-6 - -
92	Uranium-234 ³	D, see ²³⁰ U W, see ²³⁰ U Y, see ²³⁰ U	1E+1 Bone surf (2E+1) - -	1E+0 Bone surf (2E+0) 7E-1 4E-2	5E-10 - 3E-10 2E-11	- 3E-12 1E-12 5E-14	- 3E-7 - -	- 3E-6 - -
92	Uranium-235 ³	D, see ²³⁰ U W, see ²³⁰ U Y, see ²³⁰ U	1E+1 Bone surf (2E+1) - -	1E+0 Bone surf (2E+0) 8E-1 4E-2	6E-10 - 3E-10 2E-11	- 3E-12 1E-12 6E-14	- 3E-7 - -	- 3E-6 - -
92	Uranium-236	D, see ²³⁰ U W, see ²³⁰ U Y, see ²³⁰ U	1E+1 Bone surf (2E+1) - -	1E+0 Bone surf (2E+0) 8E-1 4E-2	5E-10 - 3E-10 2E-11	- 3E-12 1E-12 6E-14	- 3E-7 - -	- 3E-6 - -
92	Uranium-237	D, see ²³⁰ U W, see ²³⁰ U Y, see ²³⁰ U	2E+3 LLI wall (2E+3) - -	3E+3 - 2E+3 2E+3	1E-6 - 7E-7 6E-7	4E-9 - 2E-9 2E-9	- 3E-5 - -	- 3E-4 - -
92	Uranium-238 ³	D, see ²³⁰ U W, see ²³⁰ U Y, see ²³⁰ U	1E+1 Bone surf (2E+1) - -	1E+0 Bone surf (2E+0) 8E-1 4E-2	6E-10 - 3E-10 2E-11	- 3E-12 1E-12 6E-14	- 3E-7 - -	- 3E-6 - -
92	Uranium-239 ²	D, see ²³⁰ U W, see ²³⁰ U Y, see ²³⁰ U	7E+4 - -	2E+5 2E+5 2E+5	8E-5 7E-5 6E-5	3E-7 2E-7 2E-7	9E-4 - -	9E-3 - -
29	Uranium-240	D, see ²³⁰ U W, see ²³⁰ U Y, see ²³⁰ U	1E+3 - -	4E+3 3E+3 2E+3	2E-6 1E-6 1E-6	5E-9 4E-9 3E-9	2E-5 - -	2E-4 - -
92	Uranium-natural ³	D, see ²³⁰ U W, see ²³⁰ U Y, see ²³⁰ U	1E+1 Bone surf (2E+1) - -	1E+0 Bone surf (2E+0) 8E-1 5E-2	5E-10 - 3E-10 2E-11	- 3E-12 9E-13 9E-14	- 3E-7 - -	- 3E-6 - -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
93	Neptunium-232 ²	W, all compounds	1E+5 -	2E+3 Bone surf (5E+2)	7E-7 -	- 6E-9	2E-3 -	2E-2 -
93	Neptunium-233 ²	W, all compounds	8E+5	3E+6	1E-3	4E-6	1E-2	1E-1
93	Neptunium-234	W, all compounds	2E+3	3E+3	1E-6	4E-9	3E-5	3E-4
93	Neptunium-235	W, all compounds	2E+4 LLI wall (2E+4)	8E+2 Bone surf (1E+3)	3E-7 -	- 2E-9	- 3E-4	- 3E-3
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 ²	W, all compounds	2E+4	8E+4	3E-5	1E-7	3E-4	3E-3
94	Plutonium-234	W, all compounds except PuO ₂ Y, PuO ₂	8E+3 -	2E-2 2E+2	9E-8 8E-8	3E-10 3E-10	1E-4 -	1E-3 -
94	Plutonium-235 ²	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 -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
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 -
94	Plutonium-240	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 -
94	Plutonium-241	W, see ²³⁴ Pu Y, see ²³⁴ Pu	4E+1 Bone surf (7E+1) -	3E-1 Bone surf (6E-1) 8E-1 Bone surf (1E+0)	1E-10 - 3E-10	- 8E-13 1E-12	- 1E-6 -	- 1E-5 -
94	Plutonium-242	W, see ²³⁴ Pu Y, see ²³⁴ Pu	8E-1 Bone surf (1E+0) -	7E-3 Bone surf (1E-2) 2E-2 Bone surf (2E-2)	3E-12 - 7E-12	- 2E-14 2E-14	- 2E-8 -	- 2E-7 -
94	Plutonium-243	W, see ²³⁴ Pu Y, see ²³⁴ Pu	2E+4 -	4E+4 4E+4	2E-5 2E-5	5E-8 5E-8	2E-4 -	2E-3 -
94	Plutonium-244	W, see ²³⁴ Pu Y, see ²³⁴ Pu	8E-1 Bone surf (2E+0) -	7E-3 Bone surf (1E-2) 2E-2 Bone surf (2E-2)	3E-12 - 7E-12	- 2E-14 2E-14	- 2E-8 -	- 2E-7 -
94	Plutonium-245	W, see ²³⁴ Pu Y, see ²³⁴ Pu	2E+3 -	5E+3 4E+3	2E-6 2E-6	6E-9 6E-9	3E-5 -	3E-4 -
94	Plutonium-246	W, see ²³⁴ Pu Y, see ²³⁴ Pu	4E+2 LLI wall (4E+2) -	3E+2 - 3E+2	1E-7 - 1E-7	4E-10 - 4E-10	- 6E-6 -	- 6E-5 -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
95	Americium-237 ²	W, all compounds	8E+4	3E+5	1E-4	4E-7	1E-3	1E-2
95	Americium-238 ²	W, all compounds	4E+4	3E+3 Bone surf (6E+3)	1E-6	- 9E-9	5E-4 -	5E-3 -
95	Americium-239	W, all compounds	5E+3	1E+4	5E-6	2E-8	7E-5	7E-4
95	Americium-240	W, all compounds	2E+3	3E+3	1E-6	4E-9	3E-5	3E-4
95	Americium-241	W, all compounds	8E-1 Bone surf (1E+0)	6E-3 Bone surf (1E-2)	3E-12	- 2E-14	- 2E-8	- 2E-7
95	Americium-242m	W, all compounds	8E-1 Bone surf (1E+0)	6E-3 Bone surf (1E-2)	3E-12	- 2E-14	- 2E-8	- 2E-7
95	Americium-242	W, all compounds	4E+3	8E+1 Bone surf (9E+1)	4E-8	- 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 ²	W, all compounds	6E+4 St wall (8E+4)	4E+3 Bone surf (7E+3)	2E-6	- 1E-8	- 1E-3	- 1E-2
95	Americium-244	W, all compounds	3E+3	2E+2 Bone surf (3E+2)	8E-8	- 4E-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 ²	W, all compounds	5E+4 St wall (6E+4)	2E+5	8E-5	3E-7	- 8E-4	- 8E-3
95	Americium-246 ²	W, all compounds	3E+4	1E+5	4E-5	1E-7	4E-4	4E-3
96	Curium-238	W, all compounds	2E+4	1E+3	5E-7	2E-9	2E-4	2E-3
96	Curium-240	W, all compounds	6E+1 Bone surf (8E+1)	6E-1 Bone surf (6E-1)	2E-10	- 9E-13	- 1E-6	- 1E-5

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation ALI (μCi) DAC (μCi/ml)		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
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
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 ²	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

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air (μCi/ml)	Water (μCi/ml)	Monthly Average Concentration (μCi/ml)
				ALI (μCi)	DAC (μCi/ml)			
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 ²	W, all compounds except those given for Y Y, oxides and hydroxides	3E+4 St wall (3E+4) -	6E+2 - 6E+2	2E-7 - 2E-7	8E-10 - 8E-10	- 4E-4 -	- 4E-3 -
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 Y, see ²⁴⁴ Cf	8E+0 Bone surf (2E+1) -	6E-2 Bone surf (1E-1) 1E-1	3E-11 - 4E-11	- 2E-13 1E-13	- 2E-7 -	- 2E-6 -
98	Californium-249	W, see ²⁴⁴ Cf Y, see ²⁴⁴ Cf	5E-1 Bone surf (1E+0) - -	4E-3 Bone surf (9E-3) 1E-2 Bone surf (1E-2)	2E-12 - 4E-12 -	- 1E-14 - 2E-14	- 2E-8 -	- 2E-7 -
98	Californium-250	W, see ²⁴⁴ Cf Y, see ²⁴⁴ Cf	1E+0 Bone surf (2E+0) -	9E-3 Bone surf (2E-2) 3E-2	4E-12 - 1E-11	- 3E-14 4E-14	- 3E-8 -	- 3E-7 -
98	Californium-251	W, see ²⁴⁴ Cf Y, see ²⁴⁴ Cf	5E-1 Bone surf (1E+0) - -	4E-3 Bone surf (9E-3) 1E-2 Bone surf (1E-2)	2E-12 - 4E-12 -	- 1E-14 - 2E-14	- 2E-8 -	- 2E-7 -
98	Californium-252	W, see ²⁴⁴ Cf Y, see ²⁴⁴ Cf	2E+0 Bone surf (5E+0) -	2E-2 Bone surf (4E-2) 3E-2	8E-12 - 1E-11	- 5E-14 5E-14	- 7E-8 -	- 7E-7 -

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air ($\mu\text{Ci}/\text{ml}$)	Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				ALI (μCi)	DAC ($\mu\text{Ci}/\text{ml}$)			
98	Californium-253	W, see ^{244}Cf Y, see ^{244}Cf	2E+2 Bone surf (4E+2) -	2E+0 - 2E+0	8E-10 - 7E-10	3E-12 - 2E-12	- 5E-6 -	- 5E-5 -
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
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

Atomic No.	Radionuclide	Class	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (μCi)	Inhalation		Air ($\mu\text{Ci}/\text{ml}$)	Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
				ALI (μCi)	DAC ($\mu\text{Ci}/\text{ml}$)			
-	Any single radionuclide not listed above with decay mode other than alpha emission or spontaneous fission and with radioactive half-life less than 2 hours; Submersion ¹		-	2E+2	1E-7	1E-9	-	-
-	Any single radionuclide not listed above with decay mode other than alpha emission or spontaneous fission and with radioactive half-life greater than 2 hours.		-	2E-1	1E-10	1E-12	1E-8	1E-7
-	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

Tables I, II and III notes:

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

² these radionuclides have radiological half-lives of less than 2 hours. The total effective dose equivalent received during operations with these radionuclides might include a significant contribution from external exposure. The DAC values for all radionuclides, other than those designated class "Submersion," are based upon the committed effective dose equivalent due to the intake of the radionuclide into the body and do not include potentially significant contributions to dose equivalent from external exposures. The licensee may substitute 1E-7 microcurie per milliliter ($\mu\text{Ci}/\text{ml}$) for the listed DAC to account for the submersion dose prospectively, but should use individual monitoring devices or other radiation measuring instruments that measure external exposure to demonstrate compliance with the limits (see 20.3.4.407 NMAC);

³ for soluble mixtures of U-238, U-234 and U-235 in air, chemical toxicity may be the limiting factor (see Subsection E of 20.3.4.405 NMAC). If the percent of weight (enrichment) of U-235 is not greater than 5, the concentration value for a 40-hour workweek is 0.2 milligrams uranium per cubic meter of air average. For any enrichment, the product of the average concentration and time of exposure during a 40-hour workweek shall not exceed 8E-3 (SA) microcurie-hours per milliliter ($\mu\text{Ci}\cdot\text{hr}/\text{ml}$), where SA is the specific activity of the uranium inhaled. The specific activity for natural uranium is 6.77E-7 curies per gram uranium. The specific activity for other mixtures of U-238, U-235 and U-234, if not known, shall be:

SA = 3.6E-7 curies/gram U for depleted uranium; and

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

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

F. Notes.

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

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

Radionuclide	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
	Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
	Oral Ingestion	Inhalation		Air ($\mu\text{Ci}/\text{ml}$)	Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
		ALI (μCi)	DAC ($\mu\text{Ci}/\text{ml}$)			
If it is known that Ac-227-D and Cm-250-W are not present	-	7E-4	3E-13	-	-	-
If, in addition, it is known that Ac-227-W, Y, Th-229-W, Y, Th-230-W, Th-232-W, Y, Pa-231-W, Y, Np-237-W, Pu-239-W, Pu-240-W, Pu-242-W, Am-241-W, Am-242m-W, Am-243-W, Cm-245-W, Cm-246-W, Cm-247-W, Cm-248-W, Bk-247-W, Cf-249-W, and Cf-251-W are not present	-	7E-3	3E-12	-	-	-
If, in addition, it is known that Sm-146-W, Sm-147-W, Gd-148-D, W, Gd-152-D, W, Th-228-W, Y, Th-230-Y, U-232-Y, U-233-Y, U-234-Y, U-235-Y, U-236-Y, U-238-Y, Np-236-W, Pu-236-W, Y, Pu-238-W, Y, Pu-239-Y, Pu-240-Y, Pu-242-Y, Pu-244-W, Y, Cm-243-W, Cm-244-W, Cf-248-W, Cf-249-Y, Cf-250-W, Y, Cf-251-Y, Cf-252-W, Y, and Cf-254-W, Y are not present	-	7E-2	3E-11	-	-	-
If, in addition, it is known that Pb-210-D, Bi-210m-W, Po-210-D, W, Ra-223-W, Ra-225-W, Ra-226-W, Ac-225-D, W, Y, Th-227-W, Y, U-230-D, W, Y, U-232-D, W, Pu-241-W, Cm-240-W, Cm-242-W, Cf-248-Y, Es-254-W, Fm-257-W, and Md-258-W are not present	-	7E-1	3E-10	-	-	-
If, in addition, it is known that Si-32-Y, Ti-44-Y, Fe-60-D, Sr-90-Y, Zr-93-D, Cd-113m-D, Cd-113-D, In-115-D, W, La-138-D, Cd-176-W, Hf-178m-D, W, Hf-182-D, W, Bi-210m-D, Ra-224-W, Ra-228-W, Ac-226-D, W, Y, Pa-230-W, Y, U-233-D, W, U-234-D, W, U-235-D, W, U-236-D, W, U-238-D, W, Pu-241-Y, Bk-249-W, Cf-253-W, Y, and Es-253-W are not present	-	7E+0	3E-9	-	-	-
If it is known that Ac-227-D, W, Y, Th-229-W, Y, Th-232-W, Y, Pa-231-W, Y, Cm-248-W, and Cm-250-W are not present	-	-	-	1E-14	-	-
If, in addition, it is known that Sm-146-W, Gd-148-D, W, Gd-152-D, Th-228-W, Y, Th-230-W, Y, U-232-Y, U-233-Y, U-234-Y, U-235-Y, U-236-Y, U-238-Y, U-Nat-Y, Np-236-W, Np-237-W, Pu-236-W, Y, Pu-238-W, Y, Pu-239-W, Y, Pu-240-W, Y, Pu-242-W, Y, Pu-244-W, Y, Am-241-W, Am-242m-W, Am-243-W, Cm-243-W, Cm-244-W, Cm-245-W, Cm-246-W, Cm-247-W, Bk-247-W, Cf-249-W, Y, Cf-250-W, Y, Cf-251-W, Y, Cf-252-W, Y, and Cf-254-W, Y are not present.	-	-	-	1E-13	-	-

Radionuclide	Table I Occupational Values			Table II Effluent Concentrations		Table III Releases to Sewers
	Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
	Oral Ingestion	Inhalation		Air ($\mu\text{Ci}/\text{ml}$)	Water ($\mu\text{Ci}/\text{ml}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$)
	ALI (μCi)	ALI (μCi)	DAC ($\mu\text{Ci}/\text{ml}$)			
If, in addition, it is known that Sm-147-W, Gd-152-W, Pb-210-D, Bi-210m-W, Po-210-D, W, Ra-223-W, Ra-225-W, Ra-226-W, Ac-225-D, W, Y, Th-227-W, Y, U-230-D, W, Y, U-232-D, W, U-Nat-W, Pu-241-W, Cm-240-W, Cm-242-W, Cf-248-W, Y, Es-254-W, Fm-257-W, and Md-258-W are not present.	-	-	-	1E-12	-	-
If, in addition it is known that Fe-60, Sr-90, Cd-113m, Cd-113, In-115, I-129, Cs-134, Sm-145, Sm-147, Gd-148, Gd-152, Hg-194 (organic), Bi-210m, Ra-223, Ra-224, Ra-225, Ac-225, Th-228, Th-230, U-233, U-234, U-235, U-236, U-238, U-Nat, Cm-242, Cf-248, Es-254, Fm-257, and Md-258 are not present.	-	-	-	-	1E-6	1E-5

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

(4) If the identity and concentration of each radionuclide in a mixture are known, the limiting values should be derived as follows: determine, for each radionuclide in the mixture, the ratio between the concentration present in the mixture and the concentration otherwise established in this section for the specific radionuclide when not in a mixture. The sum of such ratios for all of the radionuclides in the mixture may not exceed "1" (i.e., "unity"). Example: If radionuclides "A," "B" and "C" are present in concentrations C_A , C_B and C_C , and if the applicable DACs are DAC_A , DAC_B and DAC_C , respectively, then the concentrations shall be limited so that the following relationship exists:

$$\frac{C_A}{\text{DAC}_A} + \frac{C_B}{\text{DAC}_B} + \frac{C_C}{\text{DAC}_C} < 1$$

(5) To convert microcuries to kilobecquerels, multiply the microcurie value by 37.
[20.3.4.461 NMAC - Rp, 20.3.4.461 NMAC, 4/30/2009]

20.3.4.462 APPENDIX C - QUANTITIES¹ OF LICENSED MATERIAL REQUIRING LABELING:

A. Table 462.1.

TABLE 462.1	
Radionuclide	Quantity (microcuries ²)
Hydrogen-3	1,000
Beryllium-7	1,000
Beryllium-10	1
Carbon-11	1,000
Carbon-14	100
Fluorine-18	1,000
Sodium-22	100
Sodium-24	100

TABLE 462.1	
Radionuclide	Quantity (microcuries ²)
Magnesium-28	100
Aluminum-26	10
Silicon-31	1,000
Silicon-32	1
Phosphorus-32	10
Phosphorus-33	100
Sulfur-35	100
Chlorine-36	10
Chlorine-38	1,000
Chlorine-39	1,000
Argon-39	1,000
Argon-41	1,000
Potassium-40	100
Potassium-42	1,000
Potassium-43	1,000
Potassium-44	1,000
Potassium-45	1,000
Calcium-41	100
Calcium-45	100
Calcium-47	100
Scandium-43	1,000
Scandium-44m	100
Scandium-44	100
Scandium-46	10
Scandium-47	100
Scandium-48	100
Scandium-49	1,000
Titanium-44	1
Titanium-45	1,000
Vanadium-47	1,000
Vanadium-48	100
Vanadium-49	1,000
Chromium-48	1,000
Chromium-49	1,000
Chromium-51	1,000
Manganese-51	1,000
Manganese-52m	1,000
Manganese-52	100
Manganese-53	1,000
Manganese-54	100
Manganese-56	1,000
Iron-52	100
Iron-55	100
Iron-59	10
Iron-60	1
Cobalt-55	100
Cobalt-56	10
Cobalt-57	100
Cobalt-58m	1,000
Cobalt-58	100
Cobalt-60m	1,000

TABLE 462.1	
Radionuclide	Quantity (microcuries ²)
Cobalt-60	1
Cobalt-61	1,000
Cobalt-62m	1,000
Nickel-56	100
Nickel-57	100
Nickel-59	100
Nickel-63	100
Nickel-65	1,000
Nickel-66	10
Copper-60	1,000
Copper-61	1,000
Copper-64	1,000
Copper-67	1,000
Zinc-62	100
Zinc-63	1,000
Zinc-65	10
Zinc-69m	100
Zinc-69	1,000
Zinc-71m	1,000
Zinc-72	100
Gallium-65	1,000
Gallium-66	100
Gallium-67	1,000
Gallium-68	1,000
Gallium-70	1,000
Gallium-72	100
Gallium-73	1,000
Germanium-66	1,000
Germanium-67	1,000
Germanium-68	10
Germanium-69	1,000
Germanium-71	1,000
Germanium-75	1,000
Germanium-77	1,000
Germanium-78	1,000
Arsenic-69	1,000
Arsenic-70	1,000
Arsenic-71	100
Arsenic-72	100
Arsenic-73	100
Arsenic-74	100
Arsenic-76	100
Arsenic-77	100
Arsenic-78	1,000
Selenium-70	1,000
Selenium-73m	1,000
Selenium-73	100
Selenium-75	100
Selenium-79	100
Selenium-81m	1,000
Selenium-81	1,000

TABLE 462.1	
Radionuclide	Quantity (microcuries ²)
Selenium-83	1,000
Bromine-74m	1,000
Bromine-74	1,000
Bromine-75	1,000
Bromine-76	100
Bromine-77	1,000
Bromine-80m	1,000
Bromine-80	1,000
Bromine-82	100
Bromine-83	1,000
Bromine-84	1,000
Krypton-74	1,000
Krypton-76	1,000
Krypton-77	1,000
Krypton-79	1,000
Krypton-81	1,000
Krypton-83m	1,000
Krypton-85m	1,000
Krypton-85	1,000
Krypton-87	1,000
Krypton-88	1,000
Rubidium-79	1,000
Rubidium-81m	1,000
Rubidium-81	1,000
Rubidium-82m	1,000
Rubidium-83	100
Rubidium-84	100
Rubidium-86	100
Rubidium-87	100
Rubidium-88	1,000
Rubidium-89	1,000
Strontium-80	100
Strontium-81	1,000
Strontium-83	100
Strontium-85m	1,000
Strontium-85	100
Strontium-87m	1,000
Strontium-89	10
Strontium-90	0.1
Strontium-91	100
Strontium-92	100
Yttrium-86m	1,000
Yttrium-86	100
Yttrium-87	100
Yttrium-88	10
Yttrium-90m	1,000
Yttrium-90	10
Yttrium-91m	1,000
Yttrium-91	10
Yttrium-92	100
Yttrium-93	100

TABLE 462.1	
Radionuclide	Quantity (microcuries ²)
Yttrium-94	1,000
Yttrium-95	1,000
Zirconium-86	100
Zirconium-88	10
Zirconium-89	100
Zirconium-93	1
Zirconium-95	10
Zirconium-97	100
Niobium-88	1,000
Niobium-89m (66 min.)	1,000
Niobium-89 (122 min.)	1,000
Niobium-90	100
Niobium-93m	10
Niobium-94	1
Niobium-95m	100
Niobium-95	100
Niobium-96	100
Niobium-97	1,000
Niobium-98	1,000
Molybdenum-90	100
Molybdenum-93m	100
Molybdenum-93	10
Molybdenum-99	100
Molybdenum-101	1,000
Technetium-93m	1,000
Technetium-93	1,000
Technetium-94m	1,000
Technetium-94	1,000
Technetium-96m	1,000
Technetium-96	100
Technetium-97m	100
Technetium-97	1,000
Technetium-98	10
Technetium-99m	1,000
Technetium-99	100
Technetium-101	1,000
Technetium-104	1,000
Ruthenium-94	1,000
Ruthenium-97	1,000
Ruthenium-103	100
Ruthenium-105	1,000
Ruthenium-106	1
Rhodium-99m	1,000
Rhodium-99	100
Rhodium-100	100
Rhodium-101m	1,000
Rhodium-101	10
Rhodium-102m	10
Rhodium-102	10
Rhodium-103m	1,000
Rhodium-105	100

TABLE 462.1	
Radionuclide	Quantity (microcuries ²)
Rhodium-106m	1,000
Rhodium-107	1,000
Palladium-100	100
Palladium-101	1,000
Palladium-103	100
Palladium-107	10
Palladium-109	100
Silver-102	1,000
Silver-103	1,000
Silver-104m	1,000
Silver-104	1,000
Silver-105	100
Silver-106m	100
Silver-106	1,000
Silver-108m	1
Silver-110m	10
Silver-111	100
Silver-112	100
Silver-115	1,000
Cadmium-104	1,000
Cadmium-107	1,000
Cadmium-109	1
Cadmium-113m	0.1
Cadmium-113	100
Cadmium-115m	10
Cadmium-115	100
Cadmium-117m	1,000
Cadmium-117	1,000
Indium-109	1,000
Indium-110m (69.1 min)	1,000
Indium-110 (4.9 h)	1,000
Indium-111	100
Indium-112	1,000
Indium-113m	1,000
Indium-114m	10
Indium-115m	1,000
Indium-115	100
Indium-116m	1,000
Indium-117m	1,000
Indium-117	1,000
Indium-119m	1,000
Tin-110	100
Tin-111	1,000
Tin-113	100
Tin-117m	100
Tin-119m	100
Tin-121m	100
Tin-121	1,000
Tin-123m	1,000
Tin-123	10
Tin-125	10

TABLE 462.1	
Radionuclide	Quantity (microcuries ²)
Tin-126	10
Tin-127	1,000
Tin-128	1,000
Antimony-115	1,000
Antimony-116m	1,000
Antimony-116	1,000
Antimony-117	1,000
Antimony-118m	1,000
Antimony-119	1,000
Antimony-120 (16 min.)	1,000
Antimony-120 (5.76 d)	100
Antimony-122	100
Antimony-124m	1,000
Antimony-124	10
Antimony-125	100
Antimony-126m	1,000
Antimony-126	100
Antimony-127	100
Antimony-128 (10.4 min)	1,000
Antimony-128 (9.01 h)	100
Antimony-129	100
Antimony-130	1,000
Antimony-131	1,000
Tellurium-116	1,000
Tellurium-121m	10
Tellurium-121	100
Tellurium-123m	10
Tellurium-123	100
Tellurium-125m	10
Tellurium-127m	10
Tellurium-127	1,000
Tellurium-129m	10
Tellurium-129	1,000
Tellurium-131m	10
Tellurium-131	100
Tellurium-132	10
Tellurium-133m	100
Tellurium-133	1,000
Tellurium-134	1,000
Iodine-120m	1,000
Iodine-120	100
Iodine-121	1,000
Iodine-123	100
Iodine-124	10
Iodine-125	1
Iodine-126	1
Iodine-128	1,000
Iodine-129	1
Iodine-130	10
Iodine-131	1
Iodine-132m	100

TABLE 462.1	
Radionuclide	Quantity (microcuries ²)
Iodine-132	100
Iodine-133	10
Iodine-134	1,000
Iodine-135	100
Xenon-120	1,000
Xenon-121	1,000
Xenon-122	1,000
Xenon-123	1,000
Xenon-125	1,000
Xenon-127	1,000
Xenon-129m	1,000
Xenon-131m	1,000
Xenon-133m	1,000
Xenon-133	1,000
Xenon-135m	1,000
Xenon-135	1,000
Xenon-138	1,000
Cesium-125	1,000
Cesium-127	1,000
Cesium-129	1,000
Cesium-130	1,000
Cesium-131	1,000
Cesium-132	100
Cesium-134m	1,000
Cesium-134	10
Cesium-135m	1,000
Cesium-135	100
Cesium-136	10
Cesium-137	10
Cesium-138	1,000
Barium-126	1,000
Barium-128	100
Barium-131m	1,000
Barium-131	100
Barium-133m	100
Barium-133	100
Barium-135m	100
Barium-139	1,000
Barium-140	100
Barium-141	1,000
Barium-142	1,000
Lanthanum-131	1,000
Lanthanum-132	100
Lanthanum-135	1,000
Lanthanum-137	10
Lanthanum-138	100
Lanthanum-140	100
Lanthanum-141	100
Lanthanum-142	1,000
Lanthanum-143	1,000
Cerium-134	100

TABLE 462.1	
Radionuclide	Quantity (microcuries ²)
Cerium-135	100
Cerium-137m	100
Cerium-137	1,000
Cerium-139	100
Cerium-141	100
Cerium-143	100
Cerium-144	1
Praseodymium-136	1,000
Praseodymium-137	1,000
Praseodymium-138m	1,000
Praseodymium-139	1,000
Praseodymium-142m	1,000
Praseodymium-142	100
Praseodymium-143	100
Praseodymium-144	1,000
Praseodymium-145	100
Praseodymium-147	1,000
Neodymium-136	1,000
Neodymium-138	100
Neodymium-139m	1,000
Neodymium-139	1,000
Neodymium-141	1,000
Neodymium-147	100
Neodymium-149	1,000
Neodymium-151	1,000
Promethium-141	1,000
Promethium-143	100
Promethium-144	10
Promethium-145	10
Promethium-146	1
Promethium-147	10
Promethium-148m	10
Promethium-149	100
Promethium-150	1,000
Promethium-151	100
Samarium-141m	1,000
Samarium-141	1,000
Samarium-142	1,000
Samarium-145	100
Samarium-146	1
Samarium-147	100
Samarium-151	10
Samarium-153	100
Samarium-155	1,000
Samarium-156	1,000
Europium-145	100
Europium-146	100
Europium-147	100
Europium-148	10
Europium-149	100
Europium-150 (12.62 h)	100

TABLE 462.1	
Radionuclide	Quantity (microcuries ²)
Europium-150 (34.2 y)	1
Europium-152m	100
Europium-152	1
Europium-154	1
Europium-155	10
Europium-156	100
Europium-157	100
Europium-158	1,000
Gadolinium-145	1,000
Gadolinium-146	10
Gadolinium-147	100
Gadolinium-148	0.001
Gadolinium-149	100
Gadolinium-151	10
Gadolinium-152	100
Gadolinium-153	10
Gadolinium-159	100
Terbium-147	1,000
Terbium-149	100
Terbium-150	1,000
Terbium-151	100
Terbium-153	1,000
Terbium-154	100
Terbium-155	1,000
Terbium-156m (5.0 h)	1,000
Terbium-156m (24.4 h)	1,000
Terbium-156	100
Terbium-157	10
Terbium-158	1
Terbium-160	10
Terbium-161	100
Dysprosium-155	1,000
Dysprosium-157	1,000
Dysprosium-159	100
Dysprosium-165	1,000
Dysprosium-166	100
Holmium-155	1,000
Holmium-157	1,000
Holmium-159	1,000
Holmium-161	1,000
Holmium-162m	1,000
Holmium-162	1,000
Holmium-164m	1,000
Holmium-164	1,000
Holmium-166m	1
Holmium-166	100
Holmium-167	1,000
Erbium-161	1,000
Erbium-165	1,000
Erbium-169	100
Erbium-171	100

TABLE 462.1	
Radionuclide	Quantity (microcuries ²)
Erbium-172	100
Thulium-162	1,000
Thulium-166	100
Thulium-167	100
Thulium-170	10
Thulium-171	10
Thulium-172	100
Thulium-173	100
Thulium-175	1,000
Ytterbium-162	1,000
Ytterbium-166	100
Ytterbium-167	1,000
Ytterbium-169	100
Ytterbium-175	100
Ytterbium-177	1,000
Ytterbium-178	1,000
Lutetium-169	100
Lutetium-170	100
Lutetium-171	100
Lutetium-172	100
Lutetium-173	10
Lutetium-174m	10
Lutetium-174	10
Lutetium-176m	1,000
Lutetium-176	100
Lutetium-177m	10
Lutetium-177	100
Lutetium-178m	1,000
Lutetium-178	1,000
Lutetium-179	1,000
Hafnium-170	100
Hafnium-172	1
Hafnium-173	1,000
Hafnium-175	100
Hafnium-177m	1,000
Hafnium-178m	0.1
Hafnium-179m	10
Hafnium-180m	1,000
Hafnium-181	10
Hafnium-182m	1,000
Hafnium-182	0.1
Hafnium-183	1,000
Hafnium-184	100
Tantalum-172	1,000
Tantalum-173	1,000
Tantalum-174	1,000
Tantalum-175	1,000
Tantalum-176	100
Tantalum-177	1,000
Tantalum-178	1,000
Tantalum-179	100

TABLE 462.1	
Radionuclide	Quantity (microcuries ²)
Tantalum-180m	1,000
Tantalum-180	100
Tantalum-182m	1,000
Tantalum-182	10
Tantalum-183	100
Tantalum-184	100
Tantalum-185	1,000
Tantalum-186	1,000
Tungsten-176	1,000
Tungsten-177	1,000
Tungsten-178	1,000
Tungsten-179	1,000
Tungsten-181	1,000
Tungsten-185	100
Tungsten-187	100
Rhenium-177	1,000
Rhenium-178	1,000
Rhenium-181	1,000
Rhenium-182 (12.7 h)	1,000
Rhenium-182 (64.0 h)	100
Rhenium-184m	10
Rhenium-184	100
Rhenium-186m	10
Rhenium-186	100
Rhenium-187	1,000
Rhenium-188m	1,000
Rhenium-188	100
Rhenium-189	100
Osmium-180	1,000
Osmium-181	1,000
Osmium-182	100
Osmium-185	100
Osmium-189m	1,000
Osmium-191m	1,000
Osmium-191	100
Osmium-193	100
Osmium-194	1
Iridium-182	1,000
Iridium-184	1,000
Iridium-185	1,000
Iridium-186	100
Iridium-187	1,000
Iridium-188	100
Iridium-189	100
Iridium-190m	1,000
Iridium-190	100
Iridium-192m (1.4 m)	10
Iridium-192 (73.8 d)	1
Iridium-194m	10
Iridium-194	100
Iridium-195m	1,000

TABLE 462.1	
Radionuclide	Quantity (microcuries ²)
Iridium-195	1,000
Platinum-186	1,000
Platinum-188	100
Platinum-189	1,000
Platinum-191	100
Platinum-193m	100
Platinum-193	1,000
Platinum-195m	100
Platinum-197m	1,000
Platinum-197	100
Platinum-199	1,000
Platinum-200	100
Gold-193	1,000
Gold-194	100
Gold-195	10
Gold-198m	100
Gold-198	100
Gold-199	100
Gold-200m	100
Gold-200	1,000
Gold-201	1,000
Mercury-193m	100
Mercury-193	1,000
Mercury-194	1
Mercury-195m	100
Mercury-195	1,000
Mercury-197m	100
Mercury-197	1,000
Mercury-199m	1,000
Mercury-203	100
Thallium-194m	1,000
Thallium-194	1,000
Thallium-195	1,000
Thallium-197	1,000
Thallium-198m	1,000
Thallium-198	1,000
Thallium-199	1,000
Thallium-200	1,000
Thallium-201	1,000
Thallium-202	100
Thallium-204	100
Lead-195m	1,000
Lead-198	1,000
Lead-199	1,000
Lead-200	100
Lead-201	1,000
Lead-202m	1,000
Lead-202	10
Lead-203	1,000
Lead-205	100
Lead-209	1,000

TABLE 462.1	
Radionuclide	Quantity (microcuries ²)
Lead-210	0.01
Lead-211	100
Lead-212	1
Lead-214	100
Bismuth-200	1,000
Bismuth-201	1,000
Bismuth-202	1,000
Bismuth-203	100
Bismuth-205	100
Bismuth-206	100
Bismuth-207	10
Bismuth-210m	0.1
Bismuth-210	1
Bismuth-212	10
Bismuth-213	10
Bismuth-214	100
Polonium-203	1,000
Polonium-205	1,000
Polonium-207	1,000
Polonium-210	0.1
Astatine-207	100
Astatine-211	10
Radon-220	1
Radon-222	1
Francium-222	100
Francium-223	100
Radium-223	0.1
Radium-224	0.1
Radium-225	0.1
Radium-226	0.1
Radium-227	1,000
Radium-228	0.1
Actinium-224	1
Actinium-225	0.01
Actinium-226	0.1
Actinium-227	0.001
Actinium-228	1
Thorium-226	10
Thorium-227	0.01
Thorium-228	0.001
Thorium-229	0.001
Thorium-230	0.001
Thorium-231	100
Thorium-232	100
Thorium-234	10
Thorium-natural	100
Protactinium-227	10
Protactinium-228	1
Protactinium-230	0.1
Protactinium-231	0.001
Protactinium-232	1

TABLE 462.1	
Radionuclide	Quantity (microcuries ²)
Protactinium-233	100
Protactinium-234	100
Uranium-230	0.01
Uranium-231	100
Uranium-232	0.001
Uranium-233	0.001
Uranium-234	0.001
Uranium-235	0.001
Uranium-236	0.001
Uranium-237	100
Uranium-238	100
Uranium-239	1,000
Uranium-240	100
Uranium-natural	100
Neptunium-232	100
Neptunium-233	1,000
Neptunium-234	100
Neptunium-235	100
Neptunium-236 (1.15E+5 y)	0.001
Neptunium-236 (22.5 h)	1
Neptunium-237	0.001
Neptunium-238	10
Neptunium-239	100
Neptunium-240	1,000
Plutonium-234	10
Plutonium-235	1,000
Plutonium-236	0.001
Plutonium-237	100
Plutonium-238	0.001
Plutonium-239	0.001
Plutonium-240	0.001
Plutonium-241	0.001
Plutonium-242	0.001
Plutonium-243	1,000
Plutonium-244	0.001
Plutonium-245	100
Americium-237	1,000
Americium-238	100
Americium-239	1,000
Americium-240	100
Americium-241	0.001
Americium-242m	0.001
Americium-242	10
Americium-243	0.001
Americium-244m	100
Americium-244	10
Americium-245	1,000
Americium-246m	1,000
Americium-246	1,000
Curium-238	100
Curium-240	0.1

TABLE 462.1	
Radionuclide	Quantity (microcuries ²)
Curium-241	1
Curium-242	0.01
Curium-243	0.001
Curium-244	0.001
Curium-245	0.001
Curium-246	0.001
Curium-247	0.001
Curium-248	0.001
Curium-249	1,000
Berkelium-245	100
Berkelium-246	100
Berkelium-247	0.001
Berkelium-249	0.1
Berkelium-250	10
Californium-244	100
Californium-246	1
Californium-248	0.01
Californium-249	0.001
Californium-250	0.001
Californium-251	0.001
Californium-252	0.001
Californium-253	0.1
Californium-254	0.001
Einsteinium-250	100
Einsteinium-251	100
Einsteinium-253	0.1
Einsteinium-254m	1
Einsteinium-254	0.01
Fermium-252	1
Fermium-253	1
Fermium-254	10
Fermium-255	1
Fermium-257	0.01
Mendelevium-257	10
Mendelevium-258	0.01
Any alpha-emitting radionuclide not listed above or mixtures of alpha emitters of unknown composition	0.001
Any radionuclide other than alpha-emitting radionuclides not listed above, or mixtures of beta emitters of unknown composition	0.01

Table 462.1 notes:

¹ the quantities listed above were derived by taking 1/10th of the most restrictive ALI listed in columns 1 and 2 of table I of 20.3.4.461 NMAC, rounding to the nearest factor of 10, and constraining the values listed between 0.001 and 1,000 microcuries (37 becquerels and 37 megabecquerels). Values of 100 microcuries (3.7 megabecquerels) have been assigned for radionuclides having a radioactive half-life in excess of E+9 years, except rhenium, 1,000 microcuries (37 megabecquerels) to take into account their low specific activity;

² to convert microcuries to kilobecquerels, multiply the microcurie value by 37.

B. Note. For purposes of Subsection E of 20.3.4.428 NMAC, Subsection A of 20.3.4.431 NMAC and Subsection A of 20.3.4.451 NMAC where there is involved a combination of radionuclides in known amounts,

the limit for the combination shall be derived as follows: determine, for each radionuclide in the combination, the ratio between the quantity present in the combination and the limit otherwise established for the specific radionuclide when not in combination. The sum of such ratios for all radionuclides in the combination may not exceed "1", that is, unity.

[20.3.4.462 NMAC - Rp, 20.3.4.462 NMAC, 4/30/2009; A, 8/10/2021]

20.3.4.463 [RESERVED]

20.3.4.464 [RESERVED]

20.3.4.465 [RESERVED]

20.3.4.466 APPENDIX G - REQUIREMENTS FOR TRANSFERS OF LOW-LEVEL RADIOACTIVE WASTE INTENDED FOR DISPOSAL AT LICENSED LAND DISPOSAL FACILITIES AND MANIFESTS: LLW means low-level radioactive waste as defined in the Low-Level Radioactive Waste Policy Act.

A. Manifest.

(1) A waste generator, collector or processor who transports, or offers for transportation LLW intended for ultimate disposal at a licensed low-level radioactive waste land disposal facility must prepare a manifest [NRC OMB Control Numbers 3150-0164, -0165 and -0166] reflecting information requested on applicable NRC forms 540 (*uniform low-level radioactive waste manifest* (shipping paper) and 541 (*uniform low-level radioactive waste manifest* (container and waste description)) and, if necessary, on an applicable NRC form 542 (*uniform low-level radioactive waste manifest* (manifest index and regional compact tabulation)). NRC forms 540 and 540A must be completed and must physically accompany the pertinent low-level waste shipment. Upon agreement between shipper and consignee, NRC forms 541, 541A, 542 and 542A may be completed, transmitted and stored in electronic media with the capability for producing legible, accurate and complete records on the respective forms. Licensees are not required by NRC to comply with the manifesting requirements of this part when they ship the following:

(a) LLW for processing and expect its return (i.e., for storage under their license) prior to disposal at a licensed land disposal facility;

(b) LLW that is being returned to the licensee who is the "waste generator" or "generator", as defined in this part; or

(c) radioactively contaminated material to a "waste processor" that becomes the processor's "residual waste" unless regulated by other applicable federal or state regulations;

(d) these exclusions from manifesting requirements do not, however, exempt the licensee from complying with applicable DOT requirements for shipments referencing 49 CFR, including the preparation of shipping papers.

(2) For guidance in completing these forms, refer to the instructions that accompany the forms. Copies of manifests required by this section may be legible carbon copies, photocopies or computer printouts that reproduce the data in the format of the uniform manifest.

(3) NRC forms 540, 540A, 541, 541A, 542 and 542A, and the accompanying instructions, in hard copy, may be obtained by writing or calling the Office of the Chief Information Officer, United States Nuclear Regulatory Commission, Washington, DC 20555-0001, telephone (301) 415-5877, or by visiting the NRC's web site at <http://www.nrc.gov> and selecting forms from the index found on the home page.

(4) This section includes information requirements of the DOT, as codified in 49 CFR Part 172. Additional 49 CFR requirements may be applicable. Information on hazardous, medical or other waste, required to meet EPA regulations, as codified in 40 CFR Parts 259, 261 or elsewhere, is not addressed in this section, and must be provided on the required EPA forms. However, any required EPA forms must accompany the *uniform low-level radioactive waste manifest* required by this chapter.

(5) As used in this section, the following definitions apply:

(a) "chelating agent" has the same meaning as that given in 20.3.13.7 NMAC;

(b) "chemical description" means a description of the principal chemical characteristics of a low-level radioactive waste;

(c) "computer-readable medium" means that the department's computer can transfer the information from the medium into its memory;

1 (d) “consignee” means the designated receiver of the shipment of low-level
2 radioactive waste;

3 (e) “decontamination facility” means a facility operating under a department, NRC
4 or agreement state license whose principal purpose is decontamination of equipment or materials to accomplish
5 recycle, reuse or other waste management objectives, and, for purposes of this part, is not considered to be a
6 consignee for LLW shipments;

7 (f) “disposal container” means a container principally used to confine low-level
8 radioactive waste during disposal operations at a land disposal facility (also see “high integrity container”); note that
9 for some shipments, the disposal container may be the transport package;

10 (g) “EPA identification number” means the number received by a transporter
11 following application to the administrator of EPA as required by 40 CFR Part 263;

12 (h) “generator” means a licensee operating under a department, NRC or agreement
13 state license who (1) is a waste generator as defined in this part, or (2) is the licensee to whom waste can be
14 attributed within the context of the Low-Level Radioactive Waste Policy Amendments Act (e.g., waste generated as
15 a result of decontamination or recycle activities);

16 (i) “high integrity container” (HIC) means a container commonly designed to meet
17 the structural stability requirements of 20.3.13.1325 NMAC, and to meet DOT requirements for a type A package;

18 (j) “land disposal facility” has the same meaning as that given in 20.3.13.7 NMAC;

19 (k) “NRC forms 540, 540A, 541, 541A, 542 and 542A” are official NRC forms
20 referenced in this section; licensees need not use originals of these NRC forms as long as any substitute forms are
21 equivalent to the original documentation in respect to content, clarity, size and location of information; upon
22 agreement between the shipper and consignee, NRC forms 541 (and 541A) and NRC forms 542 (and 542A) may be
23 completed, transmitted and stored in electronic media; the electronic media must have the capability for producing
24 legible, accurate and complete records in the format of the uniform manifest;

25 (l) “package” means the assembly of components necessary to ensure compliance
26 with the packaging requirements of DOT regulations, together with its radioactive contents, as presented for
27 transport;

28 (m) “physical description” means the items called for on NRC form 541 to describe
29 a LLW;

30 (n) “residual waste” means LLW resulting from processing or decontamination
31 activities that cannot be easily separated into distinct batches attributable to specific waste generators; this waste is
32 attributable to the processor or decontamination facility, provided that other federal laws or regulations, such as
33 those of Resource Conservation and Recovery Act (RCRA), are not applicable;

34 (o) “shipper” means the licensed entity (i.e., the waste generator, waste collector or
35 waste processor) who offers low-level radioactive waste for transportation, typically consigning this type of waste to
36 a licensed waste collector, waste processor or land disposal facility operator;

37 (p) “shipping paper” means NRC form 540 and, if required, NRC form 540A which
38 includes the information required by DOT in 49 CFR part 172;

39 (q) “source material” has the same meaning as that given in 20.3.3.7 NMAC;

40 (r) “special nuclear material” has the same meaning as that given in 20.3.3.7
41 NMAC;

42 (s) “*uniform low-level radioactive waste manifest*” or “uniform manifest” means the
43 combination of NRC forms 540, 541 and, if necessary, 542, and their respective continuation sheets as needed, or
44 equivalent;

45 (t) “waste collector,” including “waste broker,” means an entity, operating under a
46 department, NRC or agreement state license, whose principal purpose is to collect and consolidate waste generated
47 by others, and to transfer this waste, without processing or repackaging the collected waste, to another licensed
48 waste collector, licensed waste processor or licensed land disposal facility;

49 (u) “waste description” means the physical, chemical and radiological description of
50 a low-level radioactive waste as called for on NRC form 541;

51 (v) “waste generator” means an entity, operating under a department, NRC or
52 agreement state license, who (1) possesses any material or component that contains radioactivity or is radioactively
53 contaminated for which the licensee foresees no further use, and (2) transfers this material or component to a
54 licensed land disposal facility or to a licensed waste collector or processor for handling or treatment prior to
55 disposal; a licensee performing processing or decontamination services may be a “waste generator” if the transfer of
56 low-level radioactive waste from its facility is defined as “residual waste”;

(w) “waste processor” means an entity, operating under a department, NRC or agreement state license, whose principal purpose is to process, repackage or otherwise treat low-level radioactive material or waste generated by others prior to eventual transfer of waste to a licensed low-level radioactive waste land disposal facility; and

(x) “waste type” means a waste within a disposal container having a unique physical description (i.e., a specific waste descriptor code or description; or a waste sorbed on or solidified in a specifically defined media).

(6) Information requirements.

(a) General information. The shipper of the radioactive waste shall provide the following information on the uniform manifest:

- (i) the name, facility address and telephone number of the licensee shipping the waste;
- (ii) an explicit declaration indicating whether the shipper is acting as a waste generator, collector, processor or a combination of these identifiers for purposes of the manifested shipment; and
- (iii) the name, address and telephone number, or the name and EPA identification number for the carrier transporting the waste.

(b) Shipment information. The shipper of the radioactive waste shall provide the following information regarding the waste shipment on the uniform manifest:

- (i) the date of the waste shipment;
- (ii) the total number of packages or disposal containers;
- (iii) the total disposal volume and disposal weight in the shipment;
- (iv) the total radionuclide activity in the shipment;
- (v) the activity of each of the radionuclides H-3, C-14, Tc-99 and I-129 contained in the shipment; and
- (vi) the total masses of U-233, U-235 and plutonium in special nuclear material, and the total mass of uranium and thorium in source material.

(c) Disposal container and waste information. The shipper of the radioactive waste shall provide the following information on the uniform manifest regarding the waste and each disposal container of waste in the shipment:

- (i) an alphabetic or numeric identification that uniquely identifies each disposal container in the shipment;
- (ii) a physical description of the disposal container, including the manufacturer and model of any high integrity container;
- (iii) the volume displaced by the disposal container;
- (iv) the gross weight of the disposal container, including the waste;
- (v) for waste consigned to a disposal facility, the maximum radiation level at the surface of each disposal container;
- (vi) a physical and chemical description of the waste;
- (vii) the total weight percentage of chelating agent for any waste containing more than 0.1% chelating agent by weight, plus the identity of the principal chelating agent;
- (viii) the approximate volume of waste within a container;
- (ix) the sorbing or solidification media, if any, and the identity of the solidification media vendor and brand name;
- (x) the identities and activities of individual radionuclides contained in each container, the masses of U-233, U-235 and plutonium in special nuclear material, and the masses of uranium and thorium in source material, including fissile category classification; for discrete waste types (i.e., activated materials, contaminated equipment, mechanical filters, sealed source/devices and wastes in solidification/stabilization media), the identities and activities of individual radionuclides associated with or contained on these waste types within a disposal container shall be reported;
- (xi) the total radioactivity within each container;
- (xii) for wastes consigned to a disposal facility, the classification of the waste pursuant to 20.3.13.1324 NMAC; waste not meeting the structural stability requirements of Subsection B of 20.3.13.1325 NMAC; and
- (xiii) any other information required on a manifest or shipping paper by the DOT, the NRC or other regulatory agencies.

1 **(d) Uncontainerized waste information.** The shipper of the radioactive waste
2 shall provide the following information on the uniform manifest regarding a waste shipment delivered without a
3 disposal container:

- 4 **(i)** the approximate volume and weight of the waste;
- 5 **(ii)** a physical and chemical description of the waste;
- 6 **(iii)** the total weight percentage of chelating agent if the chelating agent
7 exceeds 0.1% by weight, plus the identity of the principal chelating agent;
- 8 **(iv)** for waste consigned to a disposal facility, the classification of the waste
9 pursuant to 20.3.13.1324 NMAC; waste not meeting the structural stability requirements of Subsection B of
10 20.3.13.1325 NMAC must be identified;
- 11 **(v)** the identities and activities of individual radionuclides contained in the
12 waste, the masses of U-233, U-235 and plutonium in special nuclear material, and the masses of uranium and
13 thorium in source material; and
- 14 **(vi)** for wastes consigned to a disposal facility, the maximum radiation
15 levels at the surface of the waste.

16 **(e) Multi-generator disposal container information.** This section applies to
17 disposal containers enclosing mixtures of waste originating from different generators. (Note: The origin of the
18 LLW resulting from a processor's activities may be attributable to one or more "generators," including "waste
19 generators," as defined in this section). It also applies to mixtures of wastes shipped in an uncontainerized form, for
20 which portions of the mixture within the shipment originate from different generators.

- 21 **(i)** For homogeneous mixtures of waste, such as incinerator ash, provide
22 the waste description applicable to the mixture and the volume of the waste attributed to each generator.
- 23 **(ii)** For heterogeneous mixtures of waste, such as the combined products
24 from a large compactor, identify each generator contributing waste to the disposal container, and, for discrete waste
25 types (i.e., activated materials, contaminated equipment, mechanical filters, sealed source/devices and wastes in
26 solidification/stabilization media), the identities and activities of individual radionuclides contained on these waste
27 types within the disposal container. For each generator, provide the following: (1) the volume of waste within the
28 disposal container; (2) a physical and chemical description of the waste, including the solidification agent, if any; (3)
29 the total weight percentage of chelating agents for any disposal container containing more than 0.1% chelating agent
30 by weight, plus the identity of the principal chelating agent; (4) the sorbing or solidification media, if any, and the
31 identity of the solidification media vendor and brand name if the media is claimed to meet stability requirements in
32 Subsection B of 20.3.13.1325 NMAC; and (5) radionuclide identities and activities contained in the waste, the
33 masses of U-233, U-235 and plutonium in special nuclear material, and the masses of uranium and thorium in source
34 material if contained in the waste.

35 **B. Certification.** An authorized representative of the waste generator, processor or collector shall
36 certify by signing and dating the shipment manifest that the transported materials are properly classified, described,
37 packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations
38 of the department, the DOT and the NRC. A collector in signing the certification is certifying that nothing has been
39 done to the collected waste which would invalidate the waste generator's certification.

40 **C. Control and Tracking.**

- 41 **(1)** Any licensee who transfers radioactive waste to a land disposal facility or a licensed
42 waste collector shall comply with the requirements in Subparagraphs (a) through (i) of this paragraph. Any licensee
43 who transfers waste to a licensed waste processor for waste treatment or repackaging shall comply with the
44 requirements of Subparagraphs (d) through (i) of this paragraph. A licensee shall:
- 45 **(a)** prepare all wastes so that the waste is classified according to 20.3.13.1324
46 NMAC, and meets the waste characteristics requirements in 20.3.13.1325 NMAC;
- 47 **(b)** label each disposal container (or transport package if potential radiation hazards
48 preclude labeling of the individual disposal container) of waste to identify whether it is class A waste, class B waste,
49 class C waste or greater than class C waste, in accordance with 20.3.13.1324 NMAC;
- 50 **(c)** conduct a quality assurance program to assure compliance with 20.3.13.1324
51 NMAC and 20.3.13.1325 NMAC (the program must include management evaluation of audits);
- 52 **(d)** prepare the NRC *uniform low-level radioactive waste manifest* as required by
53 Subsection A of this section;
- 54 **(e)** forward a copy or electronically transfer the *uniform low-level radioactive waste*
55 *manifest* to the intended consignee so that either (1) receipt of the manifest precedes the LLW shipment or (2) the

manifest is delivered to the consignee with the waste at the time the waste is transferred to the consignee. Using both delivery methods (1) and (2) is also acceptable;

- (f) include NRC form 540 (and NRC form 540A, if required) with the shipment regardless of the option chosen in Subparagraph (e) of this paragraph;
- (g) receive acknowledgment of the receipt of the shipment in the form of a signed copy of NRC form 540;
- (h) retain a copy of or electronically store the *uniform low-level radioactive waste manifest* and documentation of acknowledgment of receipt as the record of transfer of licensed material as required by 20.3.3 NMAC; and
- (i) for any shipments or any part of a shipment for which acknowledgment of receipt has not been received within the times set forth in this section, conduct an investigation in accordance with Paragraph (5) of this subsection.

(2) Any waste collector licensee who handles only prepackaged waste shall:

- (a) acknowledge receipt of the waste from the shipper within one week of receipt by returning a signed copy of NRC form 540;
- (b) prepare a new manifest to reflect consolidated shipments that meet the requirements of this section; the waste collector shall ensure that, for each container of waste in the shipment, the manifest identifies the generator of that container of waste;
- (c) forward a copy or electronically transfer the *uniform low-level radioactive waste manifest* to the intended consignee so that either (1) receipt of the manifest precedes the LLW shipment or (2) the manifest is delivered to the consignee with the waste at the time the waste is transferred to the consignee; using both delivery methods (1) and (2) is also acceptable;
- (d) include NRC form 540 (and NRC form 540A, if required) with the shipment regardless of the option chosen in Subparagraph (c) of this paragraph;
- (e) receive acknowledgment of the receipt of the shipment in the form of a signed copy of NRC form 540;
- (f) retain a copy of or electronically store the *uniform low-level radioactive waste manifest* and documentation of acknowledgment of receipt as the record of transfer of licensed material as required by 20.3.3 NMAC;
- (g) for any shipments or any part of a shipment for which acknowledgment of receipt has not been received within the times set forth in this section, conduct an investigation in accordance with Paragraph (5) of this subsection; and
- (h) notify the shipper and the department when any shipment, or part of a shipment, has not arrived within 60 days after receipt of an advance manifest, unless notified by the shipper that the shipment has been cancelled.

(3) Any licensed waste processor who treats or repackages waste shall:

- (a) acknowledge receipt of the waste from the shipper within one week of receipt by returning a signed copy of NRC form 540;
- (b) prepare a new manifest that meets the requirements of this section; preparation of the new manifest reflects that the processor is responsible for meeting these requirements; for each container of waste in the shipment, the manifest shall identify the waste generators, the preprocessed waste volume and the other information as required in Subparagraph (e) of Paragraph (6) of Subsection A of this section;
- (c) prepare all wastes so that the waste is classified according to 20.3.13.1324 NMAC, and meets the waste characteristics requirements in 20.3.13.1325 NMAC;
- (d) label each package of waste to identify whether it is class A waste, class B waste or class C waste, in accordance with 20.3.13.1324 NMAC and 20.3.13.1326 NMAC;
- (e) conduct a quality assurance program to assure compliance with 20.3.13.1324 NMAC and 20.3.13.1325 NMAC (the program shall include management evaluation of audits);
- (f) forward a copy or electronically transfer the *uniform low-level radioactive waste manifest* to the intended consignee so that either (1) receipt of the manifest precedes the LLW shipment or (2) the manifest is delivered to the consignee with the waste at the time the waste is transferred to the consignee; using both delivery methods (1) and (2) is also acceptable;
- (g) include NRC form 540 (and NRC form 540A, if required) with the shipment regardless of the option chosen in paragraph Subparagraph (f) of this paragraph;
- (h) receive acknowledgment of the receipt of the shipment in the form of a signed copy of NRC form 540;

(i) retain a copy of or electronically store the *uniform low-level radioactive waste manifest* and documentation of acknowledgment of receipt as the record of transfer of licensed material as required by 20.3.3 NMAC;

(j) for any shipment or any part of a shipment for which acknowledgment of receipt has not been received within the times set forth in this section, conduct an investigation in accordance with Paragraph (5) of this subsection; and

(k) notify the shipper and the department when any shipment, or part of a shipment, has not arrived within 60 days after receipt of an advance manifest, unless notified by the shipper that the shipment has been canceled.

(4) The land disposal facility operator shall:

(a) acknowledge receipt of the waste within one week of receipt by returning, as a minimum, a signed copy of NRC form 540 to the shipper; the shipper to be notified is the licensee who last possessed the waste and transferred the waste to the operator; if any discrepancy exists between materials listed on the *uniform low-level radioactive waste manifest* and materials received, copies or electronic transfer of the affected forms must be returned indicating the discrepancy;

(b) maintain copies of all completed manifests and electronically store the information required by 20.3.13.1334 NMAC until the department terminates the license; and

(c) notify the shipper and the department when any shipment, or part of a shipment, has not arrived within 60 days after receipt of an advance manifest, unless notified by the shipper that the shipment has been canceled.

(5) Any shipment or part of a shipment for which acknowledgment is not received within the times set forth in this section must:

(a) be investigated by the shipper if the shipper has not received notification or receipt within 20 days after transfer; and

(b) be traced and reported; the investigation shall include tracing the shipment and filing a report with the department; each licensee who conducts a trace investigation shall file a written report with the department within 2 weeks of completion of the investigation.

[20.3.4.466 NMAC - Rp, 20.3.4.466 NMAC, 4/30/2009; A, 8/10/2021]

20.3.4.467 NATIONALLY TRACKED SOURCE THRESHOLDS: The terabecquerel values are the regulatory standard. The curie values specified are obtained by converting from the terabecquerel value. The curie values are provided for practical usefulness only and are rounded after conversion.

TABLE 467.1				
Radioactive Material	Category 1 terabecquerel	Category 1 curie	Category 2 terabecquerel	Category 2 curie
Actinium-227	20	540	0.2	5.4
Americium-241	60	1,600	0.6	16
Americium-241/Be	60	1,600	0.6	16
Californium-252	20	540	0.2	5.4
Cobalt-60	30	810	0.3	8.1
Curium-244	50	1,400	0.5	14
Cesium-137	100	2,700	1	27
Gadolinium-153	1,000	27,000	10	270
Iridium-192	80	2,200	0.8	22
Plutonium-238	60	1,600	0.6	16
Plutonium-239/Be	60	1,600	0.6	16
Polonium-210	60	1,600	0.6	16
Promethium-147	40,000	1,100,000	400	11,000
Radium-226	40	1,100	0.4	11
Selenium-75	200	5,400	2	54
Strontium-90	1,000	27,000	10	270
Thorium-228	20	540	0.2	5.4
Thorium-229	20	540	0.2	5.4
Thulium-170	20,000	540,000	200	5,400

TABLE 467.1				
Radioactive Material	Category 1 terabecquerel	Category 1 curie	Category 2 terabecquerel	Category 2 curie
Ytterbium-169	300	8,100	3	81

[20.3.4.467 NMAC - N, 4/30/2009]

HISTORY OF 20.3.4 NMAC:

Pre-NMAC History: The material in this part was derived from that previously filed as follows:

EIB 73-2, Regulations for Governing the Health and Environmental Aspects of Radiation filed on 7/9/1973;

EIB 73-2, Amendment 1, Regulations for Governing the Health and Environmental Aspects of Radiation filed on 4/17/1978;

EIB RPR-1, Radiation Protection Regulations filed on 4/21/1980;

EIB RPR-1, Amendment 1, Radiation Protection Regulations filed on 10/13/1981;

EIB RPR-1, Amendment 2, Radiation Protection Regulations filed on 12/15/1982; and

EIB RPR-1, Radiation Protection Regulations filed on 3/10/1989.

History of Repealed Material: 20.3.4 NMAC, Standards for Protection Against Radiation (filed 3/15/2004) repealed 4/30/2009.

Other History: EIB RPR 1, Radiation Protection Regulations, filed 3/10/1989 renumbered and reformatted to 20 NMAC 3.1; Radioactive Materials and Radiation Machines, effective 5/3/1995;
20 NMAC 3.1; Radioactive Materials and Radiation Machines (filed 4/3/1995) internally renumbered, reformatted and replaced by 20 NMAC 3.1, Radioactive Materials and Radiation Machines, effective 7/30/1999.
20 NMAC 3.1.Subpart 4, Standards for Protection Against Radiation (filed 6/17/1999) reformatted, amended and replaced by 20.3.4 NMAC, Standards for Protection Against Radiation, effective 4/15/2004.
20.3.4 NMAC, Standards for Protection Against Radiation (filed 03/15/2004) replaced by 20.3.4 NMAC, Standards for Protection Against Radiation, effective 4/30/2009.

TITLE 20 ENVIRONMENTAL PROTECTION
CHAPTER 3 RADIATION PROTECTION
PART 6 ~~[X-RAYS IN THE HEALING ARTS]~~ MEDICAL DIAGNOSTIC AND INTERVENTIONAL X-RAY AND IMAGING SYSTEMS

20.3.6.1 ISSUING AGENCY: Environmental Improvement Board.
[[5/3/95; Recompiled 11/27/01] 20.3.6.1 NMAC – Rp 20.3.6.1, xx/xx/2026]

20.3.6.2 SCOPE: ~~[This subpart (now 20.3.6 NMAC) establishes requirements, for which a registrant is responsible, for use of x ray equipment by or under the supervision of an individual authorized by and licensed in accordance with state statutes to engage in the healing arts or veterinary medicine. The provisions of this subpart [now part] are in addition to, and not in substitution for, other applicable provisions of these regulations.] This Part establishes requirements, for which a registrant or licensee is responsible, for use of diagnostic and interventional x-ray equipment and imaging systems by, or under the supervision of, an individual authorized by and licensed in accordance with State statutes to engage in the healing arts or veterinary medicine. The provisions of this Part are in addition to, and not in substitution for, other applicable provisions of Parts 1, 2, 4, 7, 9, 10, 19, and 20 of 20.3 NMAC.~~
[[5/3/95; Recompiled 11/27/01] 20.3.6.2 NMAC – Rp 20.3.6.2 NMAC, xx/xx/2026]

20.3.6.3 STATUTORY AUTHORITY: Sections 74-1-8(A)(5), 74-1-9, 74-3-5 and 74-3-9 NMSA 1978.
[[5/3/95; Recompiled 11/27/01] 20.3.6.3 NMAC – Rp 20.3.6.3 NMAC, xx/xx/2026]

20.3.6.4 DURATION: Permanent.
[[5/3/95; Recompiled 11/27/01] 20.3.6.4 NMAC – Rp 20.3.6.4 NMAC, xx/xx/2026]

20.3.6.5 EFFECTIVE DATE: Effective XX/XX/2026, [June —, 2026 unless a later date is cited at the end of a section or paragraph of this Part, this part, less Subpart 14 (now 20.3.14 NMAC), superseded EIB RPR 1, Radiation Protection Regulations, filed March 10, 1989. Any reference to EIB RPR 1 on any other regulations shall be construed to mean these regulations. Effective July 30, 1999, this part has been internally renumbered and history notes have been added for inclusion into the New Mexico Administrative Code.

A. Subpart 14 (now 20.3.14 NMAC) is effective August 2, 1995.

B. Supersession of EIB RPR 1 shall not affect any administrative or judicial enforcement action pending on the effective date of these regulations, nor the validity of any license issued pursuant to EIB RPR 1.]
[[5/3/95; 8/2/95; 7/30/99; Recompiled 11/27/01] 20.3.6.5 NMAC – Rp 20.3.6.5 NMAC, xx/xx/2026]

[Compiler's note: The words *or paragraph*, above, are no longer applicable. Later dates are now cited only at the end of sections, in the history notes appearing in brackets.]

20.3.6.6 OBJECTIVE:

A. To protect the public and occupationally exposed individuals from unnecessary exposure to ionizing radiation.

B. To provide for the safe possession and use of radioactive materials and radiation machines in keeping with the As Low As Reasonably Possible (ALARA) principle.
[[5/3/95; Recompiled 11/27/01] 20.3.2.6 NMAC – Rp 20.3.2.6 NMAC, xx/xx/2026]

20.3.6.7 DEFINITIONS: As used in this subpart (~~now part~~):

A. Terms beginning with numerals or the letter "A."

(1) **"Accessible surface"** means the external surface of the enclosure or housing provided by the manufacture;

(2) ~~["added filter" means the filter added to the inherent filtration;]~~ **"Air kerma"** means kerma in air (see definition of Kerma).

(3) **"Air kerma rate (AKR)"** means the air kerma per unit time.

(4) **"Alert value"** means a dose index (e.g., of CTDIvol(mGy) or DLP(mGy-cm)) that is set by the registrant or licensee to trigger an alert to the CT operator prior to scanning within an ongoing examination. The Alert value represents a universal dose index value well above the registrant or licensee's established range for the examination that warrants more stringent review and consideration before proceeding.

~~[C-]~~(5) **"Aluminum equivalent"** means the thickness of aluminum (type 1100 alloy) affording the same attenuation, under specified conditions as the material in question; (the nominal chemical composition of type 1100 aluminum alloy is 99.00 percent minimum aluminum, 0.12 percent copper);

(6) **"Articulated joint"** means a joint between two separate sections of a tabletop where the joint provides the capacity of one of the sections to pivot on the line segment along which the sections join.

~~[D-]~~(7) **"Attenuation block"** means a block or stack 3.8 cm thick of type 1100 aluminum alloy or other material having equivalent attenuation;

~~[E-]~~(8) **"Automatic exposure control (AEC)"** means a device which automatically controls one or more technique factors in order to obtain at a preselected location(s) a required quantity of radiation (see also "phototimer");

(9) **"Automatic exposure rate control (AERC)"** means a device which automatically controls one or more technique factors in order to obtain, at a preselected location(s), a required quantity of radiation per unit time.

B. Terms beginning with numerals or the letter "B."

~~[F-]~~(1) **"Barrier"** (see "protective barrier");

~~[G-]~~(2) **"Beam axis"** means a line from the source through the center of the x-ray field;

~~[H-]~~(3) **"Beam-limiting device"** means a device which provides a means to restrict the dimensions of the x-ray field;

(4) **"Bone densitometer"** means a device intended for medical purposes to measure bone density and mineral content by x-ray or gamma ray transmission measurements through the bone and adjacent tissues. This generic type of device may include signal analysis and display equipment, patient and equipment supports, component parts, and accessories.

(5) **"Bone densitometry"** means a noninvasive measurement of certain physical characteristics of bone that reflect bone strength. Test results are typically reported as bone mineral content or density and are used for diagnosing osteoporosis, estimating fracture risk, and monitoring changes in bone mineral content.

C. Terms beginning with numerals or the letter "C."

(1) **"C-arm fluoroscope"** means a fluoroscopic x-ray system in which the image receptor and the x-ray tube housing assembly are connected or coordinated to maintain a spatial relationship. Such a system allows a change in the direction of the beam axis with respect to the patient without moving the patient.

(2) **"Cantilevered tabletop"** means a tabletop designed such that the unsupported portion can be extended at least 100 cm beyond the support.

(3) **"Cassette holder"** means a device, other than a spot-film device, that supports and/or fixes the position of the image receptor during a radiographic exposure.

~~[J-]~~(4) **"Coefficient of variation (SA)"** means the ratio of the standard deviation to the mean value of a population of observations. It is estimated using the following equation:

where:

$\bar{x}$ = mean value of observations in sample

x_i = i th observation in sample

N = number of observations in sample]

$$C = \frac{s}{\bar{x}} = \frac{1}{\bar{x}} \left[\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n - 1} \right]^{1/2}$$

s = Estimated standard deviation of the population.

$\bar{x}$ = Mean value of observations in sample;

x_i = i th observation in sample;

n = Number of observations sampled.^{2/}

~~[K-]~~(5) **"Collimator"** means a device or mechanism by which the x-ray beam is restricted in size;

(6) **"Computed radiography (CR; also see DR)"** means a digital x-ray imaging method in which a photo-stimulable phosphor is used to capture and store a latent image. The latent image is read out by

stimulating the phosphor with a laser. Computed radiography systems may use cassettes to house the phosphor, or it may be integrated into a digital radiography system.

(7) **"Computed tomography (CT)"** means the production of a tomogram by the acquisition and computer processing of x-ray transmission data.

(8) **"Computed tomography dose index(CTDI)"** means the average absorbed dose, along the z-axis, from a series of contiguous irradiations. It is measured from one axial CT scan (one rotation of the x-ray tube), and is calculated by dividing the integrated absorbed dose by the nominal total beam collimation. The scattering media for CTDI consist of two (16 and 32 cm in diameter) polymethylmethacrylate (PMMA, e.g., acrylic or Lucite) cylinders of 14 cm length. The equation is:

$$CTDI = \frac{1}{NT} \int_{-\infty}^{\infty} D(z) dz ,$$

Where:

$D(z)$ = the radiation dose profile along the z-axis.

N = the number of tomographic sections imaged in a single axial scan. This is equal to the number of data channels used in a particular scan. The value of N may be less than or equal to the maximum number of data channels available on the system, and

T = the width of the tomographic section along the z-axis imaged by one data channel. In multiple-detector-row (multislice) CT scanners, several detector elements may be grouped together to form one data channel. In single-detector-row (single-slice) CT, the z-axis collimation (T) is the nominal scan width.

(9) **"CTDI₁₀₀"** means the accumulated multiple scan dose at the center of a 100-mm scan and underestimates the accumulated dose for longer scan lengths. It is thus smaller than the equilibrium dose. The CTDI₁₀₀ requires integration of the radiation dose profile from a single axial scan over specific integration limits. In the case of CTDI₁₀₀, the integration limits are +50 mm, which corresponds to the 100-mm length of the commercially available "pencil" ionization chamber. CTDI₁₀₀ is acquired using a 100-mm long, 3-cc active volume CT "pencil" ionization chamber and one of the two standard CTDI acrylic phantoms (16 and 32 cm diameter) and a stationary patient table. The equation is:

$$CTDI_{100} = \frac{1}{NT} \int_{-50mm}^{50mm} D(z) dz$$

(10) **"CTDI_{vol}"** see "Volume Computed Tomography Dose Index (CTDI_{vol}) "

(11) **"CTDI_w"** see "Weighted Computed Tomography Dose Index (CTDI_w) "

(12) **"Cone Beam Computed Tomography (CBCT)"** is a volumetric imaging modality.

Volumetric data are acquired using two dimensional digital detector arrays, and a cone-shaped x-ray beam (instead of fan-shaped) that rotates around the patient. Reconstruction algorithms can be used to generate images of any desired plane.

[E-](13) **"Contact therapy system"** means that the x-ray tube port is put in contact with, or within 5 centimeters of, the surface being treated;

[M-](14) **"Control panel"** means that part of the x-ray control upon which are mounted the switches, knobs, pushbuttons and other hardware necessary for manually setting the technique factors;

[N-](15) **"Cooling curve"** means the graphical relationship between heat units stored and cooling time;

(16) **"Cradle"** means:

(a) A removable device which supports and may restrain a patient above an x-ray table; or

(b) A device;

(i) Whose patient support structure is interposed between the patient and the image receptor during normal use;

(ii) Which is equipped with means for patient restraint; and

(iii) Which is capable of rotation about its long (longitudinal) axis.

(17) **"CT"** (See "Computed tomography").

(18) "CT conditions of operation" means all selectable parameters governing the operation of a CT x-ray system including nominal tomographic section thickness, filtration, and the technique factors as defined in F.2.

(19) "CT gantry" means tube housing assemblies, beam-limiting devices, detectors, and the supporting structures, frames, and covers which hold and/or enclose these components within a computed tomography system.

(20) "CT number" means the number used to represent the x-ray attenuation associated with each elemental area of the CT image:

$$\overline{\text{CTN}} = \frac{k(\mu_x - \mu_w)}{\mu_w}$$

Where:

- k = A constant, a normal value of 1,000 when the Hounsfield scale of CT number is used;
- μ_x = Linear attenuation coefficient of the material of interest;
- μ_w = Linear attenuation coefficient of water.

(21) "Cumulative air kerma" means the total air kerma accrued from the beginning of an examination or procedure and includes all contributions from fluoroscopic and radiographic irradiation.

D. Terms beginning with numerals or the letter "D."

[Q-](1) "Dead man switch" means a switch so constructed that a circuit closing contact can be maintained only by continuous pressure on the switch by the operator;

[P-](2) "Density (D)" (as used in conjunction with image receptors) means the logarithm to the base 10 of the ratio of the incident to the transmitted luminous flux, where I is luminous flux; $D = \log_{10} (I_{\text{Incident}} / I_{\text{Transmitted}})$

(3) "Detector" (see Radiation detector).

(4) "Department" means the New Mexico Environment Department

(5) "Diagnostic reference level (DRL)" is an investigational level used to identify unusually high radiation doses or dose rates for common medical X-ray imaging procedures. DRLs are suggested action levels above which a facility should review its methods and determine if acceptable image quality can be achieved at lower doses. DRLs should not be applied to an individual patient.

[Q-](6) "Diagnostic source assembly" means the tube housing assembly with a beam-limiting device attached;

[R-](7) "Diagnostic x-ray system" means an x-ray system designed for irradiation of any part of the human body for the purpose of diagnosis or visualization;

(8) "Digital radiography (DR)" means an x-ray imaging method (or radiography) which produces a digital rather than analog image. DR includes both computed radiography and direct digital radiography.

(9) "Direct digital radiography (DDR; also see CR and DR)" means an x-ray imaging method in which a digital sensor, usually incorporating a thin-film transistor, is used to capture an x-ray image. Some DDR systems use a scintillator to convert x-rays to light and a photodiode array to convert light to charge, while others use a photoconductor to convert x-rays directly to charge, which is stored on the thin-film transistor.

[S-](10) "Direct scattered radiation" means that scattered radiation which has been deviated in direction only by materials irradiated by the useful beam (see also "scattered radiation");

(11) "Direct supervision" means a qualified practitioner must exercise general supervision and be present in the facility and immediately available to furnish assistance and direction throughout the performance of the procedure. It does not mean that the licensed practitioner must be present in the room when the procedure is being performed.

(12) "Dose" means the absorbed dose as defined by the International Commission on Radiation Units and Measurements. The absorbed dose, D, is the quotient of de by dm, where de is the mean energy imparted to matter of mass dm; thus $D = de/dm$, in units of J/kg, where the special name of the unit of absorbed dose is gray (Gy).

(13) "Dose area product (DAP) (aka kerma-area product (KAP))" means the product of the air kerma and the area of the irradiated field and is typically expressed in Gy-cm², so it does not change with distance from the x-ray tube.

(14) "Dose length product (DLP)" means the indicator of the integrated radiation dose from a complete CT examination. It addresses the total scan length by the $DLP (mGy\text{-}cm) = CTDI_{vol} (mGy) \times \text{scan length (cm)}$

(15) "Dose profile" means the dose as a function of position along a line.
E. Terms beginning with numerals or the letter "E."

(1) "Effective dose (E)" means the sum of the tissue-weighted equivalent doses for the radiosensitive tissues and organs of the body. It is given by the expression $E = \sum T (w_T HT)$, in which HT is the equivalent dose in tissue or organ T and w_T is the tissue weighting factor for tissue or organ T. The unit of E and HT is joule per kilogram ($J\text{-}kg^{-1}$), with the special name sievert (Sv).

[T-](2) "Entrance exposure rate" means the roentgens per unit time at the point where the center of the useful beam enters the patient;

[U-](3) "Equipment" (see "x-ray equipment");

[V-](4) "Exposure" means the quotient of dQ by dm where dQ is the absolute value of the total charge of the ions of one sign produced in air when all the electrons (negatrons and positrons) liberated or created by photons in a volume element of air having mass dm are completely stopped in air, thus $X = dQ/dm$, in units of C/kg. (The special unit of exposure is the roentgen, $1R = 2.58 \times 10^{-4} C/Kg$). A second meaning of exposure is the process or condition during which the x-ray tube produces x-ray radiation.

F. Terms beginning with numerals or the letter "F."

[W-](1) "Field emission equipment" means equipment which uses an x-ray tube in which electron emission from the cathode is due solely to the action of an electric field.

[X-](2) "Filter" means material placed in the useful beam to absorb preferentially the less penetrating components.

[Y-](3) "Fluoroscopic imaging assembly" means a component which comprises a reception system in which x-ray photons produce a fluoroscopic image. It includes equipment housings, electrical interlocks if any, the primary protective barrier, and structural material providing linkage between the image receptor and the diagnostic source assembly.

(4) "Fluoroscopic irradiation time" means the cumulative duration during an examination or procedure of operator-applied continuous pressure to the device, enabling x-ray tube activation in any fluoroscopic mode of operation.

(5) "Fluoroscopically-Guided Interventional (FGI) Procedures" means an interventional diagnostic or therapeutic procedure performed via percutaneous or other access routes, usually with local anesthesia or intravenous sedation, which uses external ionizing radiation in the form of fluoroscopy to localize or characterize a lesion, diagnostic site, or treatment site, to monitor the procedure, and to control and document therapy.

(6) "Fluoroscopy" means a technique for generating x-ray images and presenting them simultaneously and continuously as visible images. This term has the same meaning as the term "radioscopy" in the standards of the International Electrotechnical Commission.

(7) "Focal spot (actual)" means the area projected on the anode of the x-ray tube bombarded by the electrons accelerated from the cathode and from which the useful beam originates.

G. Terms beginning with numerals or the letter "G."

[Z-](1) "General purpose radiographic x-ray system" means any radiographic x-ray system which, by design, is not limited to radiographic examination of specific anatomical regions.

(2) "General supervision" means the procedure is performed under the overall direction and control of the qualified practitioner but who is not required to be physically present during the performance of the procedure.

[AA-] ["Gonad shield"] means a protective barrier for the testes or ovaries.

H. Terms beginning with numerals or the letter "H."

[AB-](1) "Half-value layer (HVL)" means the thickness of specified material which attenuates the beam of radiation to an extent such that the exposure rate is reduced to one-half of its original value. In this definition the contribution of all scattered radiation, other than any which might be present initially in the beam concerned, is deemed to be excluded.

(2) "Hand-held x-ray equipment" means x-ray equipment that is designed to be hand-held during operation.

(3) "Healing arts screening" means the testing of human beings using x-ray machines for the detection or evaluation of health indications when such tests are not specifically and individually ordered by a licensed practitioner of the healing arts legally authorized to prescribe such x-ray tests for the purpose of diagnosis or treatment.

(4) "Heat unit" means a unit of energy equal to the product of the peak kilovoltage, milliamperes, and seconds, i.e., kVp x mA x second.

(5) "HVL" (See "Half-value layer").

L. Terms beginning with numerals or the letter "L."

~~{AC.-(1)}~~ **"Image intensifier"** means a device which produces an image of greater contrast than would be produced without the device present.

~~{AD.-(2)}~~ **"Image receptor"** means any device, such as a fluorescent screen or radiographic film, x-ray image intensifier tube, solid-state detector, or gaseous detector which transforms incident x-ray photons either into a visible image or into another form which can be made into a visible image by further transformations. In those cases where means are provided to preselect a portion of the image receptor, the term "image receptor" shall mean the preselected portion of the device.

~~{AE.-(3)}~~ **"Inherent filtration"** means filtration permanently in the useful beam; it includes the window of the x-ray tube and any permanent tube or source enclosure.

~~{AF.-(4)}~~ **"Interlock"** means a device for precluding access to a radiation area by automatically terminating exposure upon entry by personnel.

(5) "Irradiation" means the exposure of matter to ionizing radiation.

(6) "Isocenter" means the center of the smallest sphere through which the beam axis passes when the equipment moves through a full range of rotations about its common center.

J. Terms beginning with numerals or the letter "J." [Reserved]

K. Terms beginning with numerals or the letter "K."

(1) **"Kerma"** means the quantity defined by the International Commission on Radiation Units and Measurements. The kerma, K, is the quotient of dE_{tr} by dm, where dE_{tr} is the sum of the initial kinetic energies of all the charged particles liberated by uncharged particles in a mass dm of material; thus $K = dE_{tr}/dm$, in units of J/kg, where the special name for the unit of kerma is gray (Gy). When the material is air, the quantity is referred to as "air kerma."

(2) **"Kerma-area product (KAP)"** (See "dose area product")

~~{AG.-(3)}~~ **"Kilovolts peak (kVp)"** (see "Peak tube potential").

(4) "kV" means kilovolts.

~~{AH.-(5)}~~ **"kWsec"** means kilowatt second which is equal to the product of peak kilovolts, amperes, and seconds or 103 kVmA sec.

L. Terms beginning with numerals or the letter "L."

(1) **"Last-image hold (LIH) radiograph"** means an image obtained either by retaining one or more fluoroscopic images, which may be temporarily integrated, at the end of a fluoroscopic exposure or by initiating a separate and distinct radiographic exposure automatically and immediately in conjunction with termination of the fluoroscopic exposure.

~~{AI.-(2)}~~ **"Lead equivalent"** means the thickness of material in question affording the same attenuation, under specified conditions, as the lead in question.

~~{AJ.-(3)}~~ **"Leakage radiation"** means radiation emanating from the diagnostic or therapeutic source assembly except for:

- (a) the useful beam; and
- (b) radiation produced when the exposure switch or timer is not activated.

~~{AK.-(4)}~~ **"Leakage technique factors"** means the technique factors associated with the diagnostic tube housing source assembly which are used in measuring leakage radiation. They are defined as follows:

(a) For diagnostic source assemblies intended for capacitor energy storage equipment, the maximum rated peak tube potential and the maximum rated number of exposures in an hour for operation at the maximum rated peak tube potential with the quantity of charge per exposure being 10 millicoulombs (or 10 mAs) or the minimum obtainable from the unit, whichever is larger;

(b) For diagnostic source assemblies intended for field emission equipment rated for pulsed operation, the maximum rated number of x-ray pulses in an hour for operation at the maximum rated peak tube potential; and

(c) For all other ~~[equipment]~~ diagnostic source assemblies, the maximum-rated peak tube potential and the maximum rated continuous tube current for the maximum rated peak tube potential.

~~{AL.-(5)}~~ **"Light field"** means that area of the intersection of the light beam from the beam-limiting device and one of the set of planes parallel to and including the plane of the image receptor, whose perimeter is the locus of points at which the illumination is one-fourth of the maximum in the intersection.

~~(6)~~ **"Line pair"** means an object in which parallel wires or strips are placed so that the space between each wire or strip is equal to the width of the wire or strip. A line pair is one space and a strip or wire.

~~(7)~~ **"Linear Accelerator"** means a device for accelerating particles employing alternate electrodes and gaps arranged in a straight line, so proportioned that when their potentials are varied in the proper amplitude and frequency, particles passing through them receive successive increments of energy.

~~(8)~~ **"Line-voltage regulation"** means the difference between the no-load and the load potentials expressed as a percent of the load line potential, that is: Percent line-voltage regulation = $100 (V_n - V_l) / V_l$ where:

(a) V_n = No-load line potential; and

(b) V_l = Load line potential

M. Terms beginning with numerals or the letter "M."

~~(1)~~ **"mAs"** means milliamperere second.

~~(2)~~ **"Maximum line current"** means the root mean square current in the supply line of an x-ray machine operating at its maximum rating.

~~(3)~~ **"Medical event"** means one or more of the following criteria have occurred:

~~(a)~~ Unintended skin dose to the same area in a single procedure greater than 2 Gy (200 rad);

~~(b)~~ Unintended dose other than skin dose in a single procedure greater than:

~~(i)~~ 5 times the facility's established protocol, and > 0.5 Gy (50 rad) to any organ; or

~~(ii)~~ 5 times the facility's established protocol, and > 0.05 Sv (5 rem) effective dose;

~~(c)~~ Wrong patient or wrong site for entire procedure when the resultant dose is:

~~(i)~~ Dose > 0.5 Gy (50 rad) to any organ; or

~~(ii)~~ Effective dose > 0.05 Sv (5 rem).

~~(4)~~ **"Mobile x-ray equipment"** (see "X-ray equipment").

~~(5)~~ **"Mode of operation"** means, for fluoroscopic systems, a distinct method of fluoroscopy or radiography provided by the manufacturer and selected with a set of several technique factors or other control settings uniquely associated with the mode. The set of distinct technique factors and control settings for the mode may be selected by the operation of a single control. Examples of distinct modes of operation include normal fluoroscopy (analog or digital), high-level control fluoroscopy, cineradiography (analog and digital), digital subtraction angiography, electronic radiography using the fluoroscopic image receptor, and photospot recording. In a specific mode of operation, certain system variables affecting kerma, AKR, or image quality, such as image magnification, x-ray field size, pulse rate, pulse duration, number of pulses, source-image receptor distance (SID), or optical aperture, may be adjustable or may vary; their variation per se does not comprise a mode of operation different from the one that has been selected.

~~(6)~~ **"Multiple tomogram system"** means a computed tomography x-ray system which obtains x-ray transmission data simultaneously during a single scan to produce more than one tomogram.

N. Terms beginning with numerals or the letter "N."

~~(1)~~ **"Noise"** in CT means the standard deviation of the fluctuations in CT number expressed as a percentage of the attenuation coefficient of water. Its estimate (S_n) is calculated using the following expression:

$$S_n = \frac{100 \cdot \overline{CS} \cdot s}{\mu_w}$$

where:

$\overline{CS}$ = Linear attenuation coefficient of the material of interest.

μ_w = Linear attenuation coefficient of water.

s = Estimated [S]standard deviation of the CT numbers of picture elements in a specified area of the CT image.^{2/}

~~(2)~~ **"Nominal tomographic section thickness"** means the full width at half-maximum of the sensitivity profile taken at the center of the cross-sectional volume over which x-ray transmission data are collected.

~~(3)~~ **"Notification value"** means a protocol-specific dose index (e.g. CTDIvol(mGy)) or of DLP (mGy-cm) that is set by the registrant to trigger a notification to the CT operator prior to scanning when the dose index exceeds the established range for the examination.

1 **O.** Terms beginning with numerals or the letter "O." [Reserved]
2 **P.** Terms beginning with numerals or the letter "P."
3 **(1)** "Patient" means an individual or animal subjected to healing arts examination, diagnosis
4 or treatment.
5 **(2)** "PBL" See "Positive beam limitation."
6 ~~[AR-](3)~~ **(3)** "Peak tube potential" means the maximum value of the potential difference
7 across the x-ray tube during an exposure.
8 ~~[AS-](4)~~ **(4)** "Personal monitoring" means the estimation of dose to a person.
9 **(5)** "Personal supervision" means a qualified expert must exercise General Supervision and
10 be present in the room or adjacent control area during the performance of the procedure.
11 **(6)** "Phantom" means a volume of material behaving in a manner similar to tissue with
12 respect to the attenuation and scattering of radiation. This requires that both the atomic number (Z) and the density
13 of the material be similar to that of tissue.
14 **(7)** "Photostimulable storage phosphor (PSP)" means a material used to capture and store
15 radiographic images in computed radiography systems.
16 ~~[AT-](8)~~ **(8)** "Phototimer" means a method for controlling radiation exposures to image
17 receptors by the amount of radiation which reaches a radiation monitoring device(s). The radiation monitoring
18 devices(s) is part of an electronic circuit which controls the duration of time the tube is activated (see also
19 "Automatic exposure control").
20 **(9)** "Pitch" means the table incrementation, in CT, per x-ray tube rotation, divided by the
21 nominal x-ray beam width at isocenter.
22 ~~[AU-](10)~~ **(10)** "Portable x-ray equipment" (see "X-ray equipment").
23 ~~[AV-](11)~~ **(11)** "Position indicating device (PID)" means a device on dental x-ray equipment
24 used to indicate the beam position and to establish a definite source-surface (skin) distance. It may or may not
25 incorporate or serve as a beam-limiting device.
26 **(12)** "Positive beam limitation" means the automatic or semi-automatic adjustment of an x-
27 ray beam to the size of the selected image receptor, whereby exposures cannot be made without such adjustment.
28 ~~[AX-](13)~~ **(13)** "Protective apron" means an apron made of radiation absorbing materials,
29 used to reduce radiation exposure.
30 ~~[AY-](14)~~ **(14)** "Protective barrier" means a barrier of radiation absorbing material(s) used to
31 reduce radiation exposure. The types of protective barriers are as follows:
32 **(a)** "Primary protective barrier" means the material, excluding filters, placed in
33 the useful beam, for protection purposes, to reduce the radiation exposure; and
34 **(b)** "Secondary protective barrier" means a barrier sufficient to attenuate the
35 stray radiation to the required degree.
36 ~~[AZ-](15)~~ **(15)** "Protective glove" means a glove made of radiation absorbing materials used
37 to reduce radiation exposure.
38 **(16)** "Protocol" means a collection of settings and parameters that fully describe an
39 examination.
40 **(17)** "Pulsed mode" means operation of the x-ray system such that the x-ray tube current is
41 pulsed by the x-ray control to produce one or more exposure intervals of duration less than one-half second.
42 **Q.** Terms beginning with numerals or the letter "Q."
43 ~~[BA-](1)~~ **(1)** "Qualified expert (QE)" means an individual who is granted professional
44 privileges based on education and experience to provide clinical services in diagnostic medical physics by the
45 department. (see [Subsection RR. of Section 7 of 20.3.1.7 NMAC]).
46 **(2)** "Quality Assurance" means a program providing for verification by written procedures
47 such as testing, auditing, and inspection to ensure that deficiencies, deviations, defective equipment, or unsafe
48 practices, or a combination thereof, relating to the use, disposal, management, or manufacture of radiation devices
49 are identified, promptly corrected, and reported to the appropriate regulatory authorities as required.
50 **(3)** "Qualified medical physicist (QMP)" means an individual who meets each of the
51 following credentials:
52 **(a)** Has earned a master's and/or doctoral degree in physics, medical physics,
53 biophysics, radiological physics, medical health physics, or equivalent disciplines from an accredited college or
54 university; and

(b) Has been granted certification in the specific subfield(s) of medical physics with its associated medical health physics aspects by an appropriate national certifying body and abides by the certifying body's requirements for continuing education;

R. Terms beginning with numerals or the letter "R."

(1) "Radiation detector" means a device which in the presence of radiation provides a signal or other indication suitable for use in measuring one or more quantities of incident radiation.

(2) "Radiation Protocol Committee (RPC)" means the representative group of qualified individuals in a CT or FGI facility responsible for the ongoing review and management of CT or FGI protocols to ensure that exams being performed achieve the desired diagnostic image quality at the lowest radiation dose possible while properly exploiting the capabilities of the equipment being used.

(3) "Radiation therapy simulation system" means a radiographic or fluoroscopic x-ray system intended for localizing the volume to be exposed during radiation therapy and confirming the position and size of the therapeutic irradiation field.

~~{BB-}~~(4) "Radiograph" means an image receptor on which the image is created directly or indirectly by an x-ray pattern and results in a permanent record.

(5) "Radiography" means a technique for generating and recording an x-ray pattern for the purpose of providing the user with an image(s) after termination of the exposure.

~~{BC-}~~(6) "Radiographic imaging system (RIS)" means any system whereby a permanent or semi-permanent image is recorded on an image receptor by the action of ionizing radiation.

~~{BD-}~~(7) "Recording" means producing a retrievable ~~[permanent]~~ form of an image resulting from x-ray photons [e.g., film, video tape].

(8) "Reference plane" means a plane which parallel to and which can be offset (as specified in manufacturer information provided to users) from the location of the tomographic plane(s).

~~{BE-}~~(9) "Registrant", as used in this Subpart [Part], means any person who owns or possesses and administratively controls an x-ray system which is used to deliberately expose humans or animals to the useful beam of the system and is required by the provisions in Subpart 1 and 2 [Part 1 and 2] of these regulations to register with this department.

~~{BF-}~~ (10) "Repair person (Service person)" means an individual who maintains an x-ray system; not limited to a manufacturer, assembler or user.

~~{BG-}~~ (11) "Response time" means the time required for an instrument system to reach 90 percent of its final reading when the radiation-sensitive volume of the instrument system is exposed to a step change in radiation flux from zero sufficient to provide a steady state midscale reading.

S. Terms beginning with numerals or the letter "S."

(1) "Scan" means the complete process of collecting x-ray transmission data for the production of a tomogram. Data may be collected simultaneously during a single scan for the production of one or more tomograms.

(2) "Scan increment" means the amount of relative displacement of the patient with respect to the CT x-ray system between successive scans measured along the direction of such displacement.

(3) "Scan sequence" means a pre-selected set of two or more scans performed consecutively under pre-selected CT conditions of operation.

(4) "Scan time" means the time elapsed during the accumulation of x-ray transmission data for a single scan.

~~{BH-}~~(5) "Scattered radiation" means radiation that, during passage through matter, has been deviated in direction (see also "Direct scattered radiation").

(6) "Sensitivity profile" means the relative response of the CT x-ray system as a function of position along a line perpendicular to the tomographic plane.

(7) "Shutter" means a device attached to the tube housing assembly which can intercept the entire cross-sectional area of the useful beam and which has a lead equivalency not less than that of the tube housing assembly.

~~{BJ-}~~ (8) "Single tomogram system" means a CT x-ray system which obtains x-ray transmission data during a scan to produce a single tomogram.

(9) "Size-specific dose estimate (SSDE)" means a patient dose estimate which takes into consideration corrections based on the size of the patient, using linear dimensions measured on the patient or patient images.

~~{BK-}~~ (10) "Source" means the focal spot of the x-ray tube.

~~{BL-}~~ (11) "Source-image receptor distance (SID)" means the distance from the source to the center of the input surface of the image receptor.

(12) "Source-skin distance (SSD)" means the distance from the source to the center of the entrant x-ray field in the plane tangent to the patient skin surface.

~~{BM-}~~ (13) "Spot film" means a radiograph which is made during a fluoroscopic examination to permanently record conditions which exist during that fluoroscopic procedure.

(14) "Spot-film device" means a device intended to transport and/or position a radiographic image receptor between the x-ray source and fluoroscopic image receptor. It includes a device intended to hold a cassette over the input end of the fluoroscopic image receptor for the purpose of producing a radiograph.

~~{BN-}~~ (15) "Stationary x-ray equipment" (see "X-ray equipment").

~~{BO-}~~ (16) "Stray radiation" means the sum of leakage and scattered radiation.

(17) "Substantial radiation dose level (SRDL)" means an appropriately-selected dose used to trigger additional dose-management actions during a procedure and medical follow-up for a radiation level that might produce a clinically-relevant injury in an average patient.

T. Terms beginning with numerals or the letter "T."

~~{BP-}~~ (1) "Technique factors" means the conditions of operation. They are specified as follows:
(a) For capacitor energy storage equipment, peak tube potential in (kVp) and quantity of charge in milliamperere-seconds (mAs);

(b) For field emission equipment rated for pulsed operation, peak tube potential in kVp and number of x-ray pulses; ~~[and]~~

(c) For CT equipment designed for pulsed operation, peak tube potential in kV, scan time in seconds, and either tube current in milliamperes (mA), x-ray pulse width in seconds, and the number of x-ray pulses per scan, or the product of tube current, x-ray pulse width, and the number of x-ray pulses in mAs;

(d) For CT equipment not designed for pulsed operation, peak tube potential in kV, and either tube current in mA and scan time in seconds, or the product of tube current and exposure time in mAs and the scan time when the scan time and exposure time are equivalent; and

~~{(3)}~~ (e) For all other equipment, peak tube potential in kVp and either tube current in mA and exposure time in seconds, or the product of tube current and exposure time in mAs.

~~{BQ-}~~ (2) "Therapeutic-type protective tube housing" means the tube housing with tube installed and it includes high voltage or filament transformers and other appropriate elements when they are contained within that housing.

(3) "Tomogram" means the depiction of the x-ray attenuation properties of a section through the body.

(4) "Tomographic plane" means that geometric plane which the manufacturer identified as correspondYng to the output tomogram.

(5) "Tomographic section" means the volume of an object whose x-ray attenuation properties are imaged in a tomogram.

~~{BR-}~~ (6) "Tube" means an x-ray tube, unless otherwise specified.

~~{BS-}~~ (7) "Tube housing assembly" means the tube housing with tube installed. It includes high-voltage or filament transformers and other appropriate elements when they are contained within the tube housing.

~~{BT-}~~ (8) "Tube rating chart" means the set of curves which specify the rated limits of operation of the tube in terms of the technique factors.

U. Terms beginning with numerals or the letter "U."

(1) "Unintended" means a patient radiation dose resulting from a human error or equipment malfunction during the procedure.

~~{BU-}~~ (2) "Useful beam" means the radiation which passes through the tube housing port and the aperture of the beam-limiting device when the exposure switch or timer is activated.

V. Terms beginning with numerals or the letter "V."

~~{BV-}~~ (1) "Variable-aperture beam-limiting device" means a beam-limiting device which has capacity for stepless adjustment of the x-ray field size at a given SID.

~~{BW-}~~ (2) "Visible area" means that portion of the input surface of the image receptor over which incident x-ray photons produce a visible image.

(3) "Volume Computed Tomography Dose Index (CTDIvol)" means a radiation dose parameter derived from the CTDIw (weighted or average CTDI given across the field of view). The formula is:

$$CTDI_{vol} = (N)(T)(CTDI_w)/I$$
, where

N = number of simultaneous axial scans per x-ray source rotation.

T = thickness of one axial scan (mm), and

I = table increment per axial scan (mm).

Thus,

CTDI_{vol} = CTDI_w / pitch

W. Terms beginning with numerals or the letter "W."

(1) "Weighted Computed Tomography Dose Index (CTDI_w)" means the estimated average CTDI₁₀₀ across the field of view (FOV). The equation is:

$$CTDI_w = 1/3 CTDI_{100,center} + 2/3 CTDI_{100,edge}.$$

Where 1/3 and 2/3 approximate the relative areas represented by the center and edge values derived using the 16 or 32 cm acrylic phantom. CTDI_w uses CTDI₁₀₀ and an f-factor for air (0.87 rad/R or 1.0 mGy/mGy).

X. Terms beginning with numerals or the letter "X."

{BX.}(1) "X-ray control" means a device which controls input power to the x-ray high-voltage generator of the x-ray tube. It includes equipment such as timers, phototimers, automatic brightness stabilizers, and similar devices, which controls the technique factors of an x-ray exposure.

(2) "X-ray equipment" means an x-ray system, subsystem or component thereof. Types of x-ray equipment are as follows:

(a) "Mobile x-ray equipment" means x-ray equipment mounted on a permanent base with wheels and/or casters for moving while completely assembled;

(b) "Portable x-ray equipment" means x-ray equipment designed to be hand-carried;

(c) "Stationary x-ray equipment" means x-ray equipment which is installed in a fixed location; and

(d) "Transportable" means x-ray equipment installed in a vehicle or trailer; and

(e) "Hand-held x-ray equipment" means x-ray equipment that is designed to be hand-held during operation.

{BY.}(3) "X-ray exposure control" means a device, switch, button or other similar means by which an operator initiates and/or terminates the radiation exposure. The x-ray exposure control may include such associated equipment as timers and back-up timers.

{BZ.}(4) "X-ray field" means that area of the intersection of the useful beam and any one of the set of planes parallel to and including the plane of the image receptor, whose perimeter is the locus of points at which the exposure rate is one-fourth of the maximum in the intersection.

{CA.}(5) "X-ray high-voltage generator" means a device which transforms electrical energy from the potential supplied by the x-ray control to the tube operating potential. The device may also include means for transforming alternating current to direct current, filament transformers for the x-ray tube(s), high-voltage switches, electrical protective devices, and other appropriate elements.

{CB.}(6) "X-ray subsystem" means any combination of two or more components of an x-ray system for which there are requirements specified in this Subpart [Part].

{CC.}(7) "X-ray system" means an assemblage of components for the controlled production of x-rays. It includes minimally an x-ray high-voltage generator, an x-ray control, a tube housing assembly, a beam-limiting device, and the necessary supporting structures. Additional components which function with the system are considered integral parts of the system.

(8) "X-ray table" means a patient support device with its patient support structure (tabletop) interposed between the patient and the image receptor during radiography and/or fluoroscopy. This includes, but is not limited to, any stretcher equipped with a radiolucent panel and any table equipped with a cassette tray (or bucky), cassette tunnel, fluoroscopic image receptor, or spot-film device beneath the tabletop.

{CD.}(9) "X-ray tube" means any electron tube which is designed for the conversion of electrical energy into x-ray energy.

Y. Terms beginning with numerals or the letter "Y." **[Reserved]**

Z. Terms beginning with numerals or the letter "Z." **[Reserved]**

[5/3/95; Recompiled 11/27/01] 20.3.6.7 NMAC – Rp 20.3.6.7 NMAC, xx/xx/2026]

20.3.6.8 - 20.3.6.601 [RESERVED]

20.3.6.602 GENERAL AND ADMINISTRATIVE REQUIREMENTS:

1 A. ~~[Administrative controls:]~~ Radiation Safety Requirements. The registrant shall be responsible for
2 directing the operation of the x-ray system(s) under his or her administrative control and shall assure that the
3 requirements of these regulations are met in the operation of the x-ray system(s).

4 (1) ~~[Registrant: The registrant shall be responsible for directing the operation of the x ray~~
5 ~~machines which he has registered with the department. He or his agent shall assure that the following provisions are~~
6 ~~met in the operation of the x ray machine(s).]~~ The registrant shall have a radiation safety program. The radiation
7 safety program shall include but not be limited to the following requirements:

8 (a) ~~[An x ray machine which does not meet the provision of these regulations shall~~
9 ~~not be operated for diagnostic or therapeutic purposes, if so directed by the department.]~~ The use of ionizing
10 radiation within its purview is performed in accordance with existing laws and regulations.

11 (b) ~~[Individuals who will be operating the x ray equipment shall be adequately~~
12 ~~instructed in the safe operating procedures and be competent in the safe use of the equipment.]~~ All persons are
13 protected as required by 20.3.4 NMAC, Standards for Protection Against Radiation.

14 (c) ~~[In the vicinity of each x ray system's control panel, a chart shall be provided~~
15 ~~which specifies for all examinations which are performed by that system a listing of information, including, but not~~
16 ~~limited to, the following, for each projection within that examination:]~~ Upon discovery of a medical event, the
17 registrant shall:

18 (i) ~~[patient's anatomical size versus technique factors to be utilized;]~~
19 Contact the department regarding the medical event within one business day;

20 (ii) ~~[type of and size of the film or film screen combination to be used;]~~
21 Provide a written report, including the analysis of the medical event, by a QMP [QE] to the department within 15
22 business days;

23 (iii) ~~[type of grid to be used, if any, and focal distance;]~~ Provide a clinical
24 summary to the prescribing physician and patient within 15 business days; and

25 (iv) ~~[source to image receptor distance to be used; and]~~ Maintain a record of
26 the medical event as part of the patient's permanent medical record.

27 ~~[(v) type and location of placement of gonad shielding to be used.]~~

28 (2) An x-ray machine which does not meet the provisions of these regulations shall not be
29 operated for diagnostic or therapeutic purposes, unless the department or a QMP [QE] determines that the non-
30 compliance shall not pose a significant radiation risk or significantly affect image quality, and arrangements have
31 been made to correct the non-compliance within 30 calendar days.

32 (3) The QMP [QE], if required in this Part, shall complete initial and routine compliance
33 evaluations following nationally recognized procedures or those recognized by the department. These evaluations
34 shall include a review of the required QC tests.

35 (4) Individuals who will be operating the x-ray equipment shall be adequately instructed in
36 the safe operating procedures and be competent in the safe use of the equipment.

37 (5) Individuals operating the x-ray systems shall meet the qualifications required by the
38 department.

39 (6) A chart shall be maintained in the vicinity of each x-ray system's control panel for all
40 examinations which are performed by that system. For each examination, the chart shall contain a list of
41 information that includes, but is not limited to the following:

42 ~~[(i)]~~ (a) patient's (adult and pediatric, if appropriate) body part and anatomical size

43 ~~[(ii)]~~ (b) technique factors

44 ~~[(iii)]~~ (c) type of image receptor used

45 ~~[(iv)]~~ (d) source to image receptor distance to be used (except for dental intraoral
46 radiography); and

47 ~~[(v)]~~ (e) type of grid if any.

48 (7) The registrant shall create and make available to x-ray operators written safety
49 procedures including instructions for patient holding and any restrictions of the operating technique required for the
50 safe operation of the particular x-ray system.

51 ~~[(d)]~~ Written safety procedures and rules shall be provided to each individual
52 operating x ray equipment under his control, including any restrictions of the operating technique required for the
53 safe operation of the particular x ray system. The operator shall be able to demonstrate familiarity with these rules.]

54 (8) A sufficient number of protective apparel (e.g., aprons, gloves, collars) and shields shall
55 be available to provide the necessary radiation protection for all patients and personnel who are involved with x-ray
56 operations.

(9) All protective apparel and auxiliary shields shall be evaluated annually for integrity and clearly labeled with their lead equivalence.

(10) Each registrant shall have a mechanism in place for the referring physician to access information on selecting the most appropriate diagnostic procedure to answer the clinical question.

(11) Nationally recognized diagnostic reference levels (DRLs) shall be utilized when applicable.

(12) The registrant shall use auxiliary equipment designed to minimize patient and personnel exposure commensurate with the needed diagnostic information.

(13) Portable or mobile x-ray equipment shall be used only for examinations where it is impractical to transfer the patient to a stationary x-ray installation.

(14) Neither the x-ray tube housing nor the collimating device shall be held during an exposure. Exceptions are allowed for [Department approved] devices specifically designed to be hand-held.

(15) The useful x-ray beam shall be limited to the area of clinical interest.

(16) Consideration shall be given to selecting the appropriate technique and employing available dose reduction methods and technologies across all patient sizes and clinical indications.

(17) A facility shall have a documented procedure in place for verification of patient identity and exam to be performed, including identification of the appropriate body part.

[(e) Except for patients who cannot be moved out of the room, only the staff and ancillary personnel required for the medical procedure or training shall be in the room during the radiographic exposure. Other than the patient being examined:]

(18) The registrant shall restrict the presence of individuals in the immediate area of the patient being examined to those required or in training for the medical procedure, or the parent or guardian of a patient while the x-ray tube is energized. The following applies to all individuals, other than the patient being examined:

[(i)](a) All individuals shall be positioned such that no part of the body, including the extremities will be struck by the useful beam unless [not] protected by 0.5 mm lead equivalent material[, will be struck by the useful beam];

[(ii)](b) [staff and ancillary personnel] All individuals shall be protected from the [direct and scatter radiation] secondary radiation by protective aprons or whole body protective barriers of not less than 0.25 mm lead equivalent material; and

[(iii)](c) Instances may warrant having human patients [who cannot be removed from the room] other than the one being examined in the room during the exam. If the procedure results in scatter radiation in excess of 0.02 mSv (2 mR) in any one hour at the position of these patients, they shall be protected from the direct scatter radiation by whole body protective barriers of 0.25 mm lead equivalent material, or shall be so positioned that the [nearest portion of the body is at least 2 meters from both the tube head and the nearest edge of the image receptor] 0.02 mSv (2 mR) in any one hour limit is met.

[(iv) when a portion of the body of any staff or ancillary personnel is potentially subjected to stray radiation which could result in that individual receiving one quarter of the maximum permissible dose as defined in Subpart 4 (now 20.3.4 NMAC), additional protective devices may be required by the department.

(f) Gonad shielding of not less than 0.25 mm lead equivalent shall be used for patients who have not passed the reproductive age during radiographic procedures in which the gonads are in the direct (useful) beam, except for cases in which this would interfere with the diagnostic procedures.]

[(g)](19) [Patients] Individuals shall not be exposed to the useful beam, except for healing arts purposes, and each exposure of which has been authorized by a licensed practitioner of the healing arts. This provision specifically prohibits deliberate exposure for the following purposes:

[(i)](a) exposure of an individual for training, demonstration or other non-healing art purposes, [unless there are also healing arts requirements and proper prescription has been provided]; and

[(ii)](b) exposure of an individual for the purpose of healing arts screening without prior written approval of the department. (Screening means an exposure of a person without a prior examination by a licensed practitioner).

[(h)](20) When a patient or film must be provided with auxiliary support during a radiation exposure:

[(i)](a) mechanical holding devices shall be used when the technique permits; the safety [rules] procedures, required by this section, shall list individual projections where holding devices cannot be utilized;

1 ~~[(iii)](b)~~ written safety procedures, as required by Paragraph 7 of Subsection A of
2 20.3.6.602 NMAC. ~~[1.d 8 Subparagraph (d), Paragraph (18), Subsection A., Section 602 of 20.3.6.602 NMAC],~~
3 shall indicate the requirements for selecting a holder and the procedure the holder shall follow;

4 ~~[(iii)](c)~~ the human holder shall be protected as required by Subsection A of this
5 section.~~[1.e (now Subparagraph (e) of Paragraph (1) of Subsection A of 20.3.6.602 NMAC)];~~

6 ~~[(iv)](d)~~ no ~~[person]~~ individual shall be used routinely to hold ~~[film]~~ the image receptor
7 or patients;

8 ~~[(v)](e)~~ such holding shall be permitted only in very unusual and rare situations; and

9 ~~[(v)](f)~~ all x-ray room doors shall be closed before an exposure is made.

10 (21) In those cases where the patient must hold the image receptor, except during intraoral
11 examinations, any portion of the body other than the area of clinical interest struck by the useful beam shall be
12 protected by not less than 0.5 millimeter lead equivalent material.

13 ~~[(i)](22)~~ Procedures and auxiliary equipment designed to minimize patient and personnel exposure
14 commensurate with the needed diagnostic information shall be utilized. This is interpreted to include, but is not
15 limited to:

16 ~~[(i)]~~ the speed of film or screen and film combinations shall be the fastest speed
17 consistent with the diagnostic objective of the examinations;]

18 ~~[(ii)](a)~~ ensuring minimum radiation exposure required to produce images of good
19 diagnostic quality for a patient; and

20 ~~[(iii)](b)~~ ensuring portable or mobile equipment is only used for examinations where it is
21 impractical to transfer the patient(s) to a stationary installation.

22 ~~[(j)](23)~~ ~~[Personnel monitoring:]~~ All persons who are associated with the operation of an x-ray
23 system are subject to ~~[the occupational exposure limits and the requirements for the determination of the doses~~
24 ~~which are stated in Sections 405 and 412. In addition, the following requirements are made:~~

25 ~~(i)~~ when protective clothing or devices are worn on portions of the body
26 and a monitoring device(s) is required, at least one such device shall be utilized as follows: 1) when an apron is
27 worn, the monitoring device shall be worn at collar level outside of the apron; and 2) the dose to the whole body
28 based on the maximum dose attributed to any one critical organ (which are the gonads, the blood forming organs,
29 head and trunk, or lens of the eye) shall be recorded in the reports required by Section 452. If more than one device
30 is used, each dose shall be identified with the area of the body where the device was worn;] requirements of Part 4 of
31 these regulations.

32 ~~[(ii)](24)~~ exposure of a personnel monitoring device to deceptively indicate a dose delivered to an
33 individual is prohibited.

34 ~~[(2)](25)~~ Information and maintenance record ~~[and associated information]~~: The registrant shall
35 maintain ~~[at least]~~ the following information for each x-ray ~~[machine]~~ system for inspection by the department for a
36 minimum of 5 years or as noted below:

37 (a) maximum rating of technique factors; model and serial numbers of all major
38 components, and user's manuals for those components, including software, shall be maintained for the life of the
39 system;

40 (b) model numbers of all certifiable components;

41 (c) aluminum equivalent filtration of the useful beam; including any routine
42 variation;

43 (d) tube rating charts and cooling curves;]

44 ~~[(e)](b)~~ record of surveys, calibrations, maintenance, modifications ~~[(from the original~~
45 ~~schematics and drawings)]~~ (e.g., major software and hardware upgrades) performed on the x-ray ~~[machine after the~~
46 ~~effective date of these regulations, along with the names of persons who performed the service]~~ system;

47 ~~[(f)](c)~~ a scale drawing of the room in which a stationary x-ray system is located; the
48 drawing shall denote the type of materials and their thickness (or lead equivalence) provided by each barrier of the
49 room (walls, ceilings, floors, doors, windows); the drawing shall also denote the type of occupancy of adjacent areas
50 to include above and below the x-ray room of concern (e.g., hallways, office, parking lots and toilets); estimates of
51 the frequency of such occupancy shall also be noted on the drawing; and

52 ~~[(g)](d)~~ a copy of all correspondence with this department regarding that x-ray
53 ~~[machine]~~ system.

54 ~~[(3)](26)~~ X-ray log. Each facility shall maintain an x-ray log containing the examinations and the
55 dates those examinations were performed. The log shall indicate when techniques for procedures vary from those

specified in the technique chart required in [Section 602.A.1.e (now Subparagraph (e) of Paragraph (1) of Subsection A of 20.3.6.602 NMAC)] Paragraph 6 of Subsection A of this section.

(27) Healing Arts Screening. Any person proposing to conduct a healing arts screening program shall not initiate such a program without prior approval of the department. When requesting such approval, that person shall submit the information outlined in Appendix A of this Part. If any information submitted to the department becomes invalid or outdated, the department shall be immediately notified. FDA/MQSA-certified facilities are registered with the department for the use of dedicated mammographic equipment to conduct mammography screening.

(28) All x-ray equipment shall be installed and used in accordance with the equipment manufacturer's specifications.

B. Quality Assurance.

(1) The registrant shall establish and maintain a quality assurance (QA) program. In addition to the standards in the modality specific sections, the registrant shall:

(a) maintain documentation of minimum qualifications for practitioners, medical physicists, and x-ray equipment operators;

(b) designate an appropriately trained individual to manage the QA program;

(c) establish and maintain written QA and quality control (QC) procedures, including evaluation frequencies and tolerances;

(d) check each study for artifacts. If an artifact is present, the source shall be identified and appropriate action taken;

(e) perform repeat / reject analysis of radiographic images at least quarterly following specifications of a nationally recognized organization;

(f) complete preventative maintenance on the x-ray systems in accordance with manufacturer specifications at intervals not to exceed 12 months;

(g) maintain documentation showing the testing instruments used in determining compliance with the provisions of this section are properly calibrated and maintained in accordance with the department minimum standard or accepted professional standards when no department minimum is defined;

(h) complete and document an annual review of the QA program; and

(i) retain QA/QC records of evaluations and reviews in accordance with state statutes, regulations, but in no case less than three years.

(2) X-Ray Film Processing Facilities. A registrant using analog image receptors (e.g. radiographic film) shall have available suitable equipment for handling and processing radiographic film in accordance with the following provisions:

(a) Manually developed film:

(i) Processing tanks shall be constructed of mechanically rigid, corrosion resistant material;

(ii) Developing solutions shall be prepared, replenished, and replaced following manufacturer recommendations;

(iii) The temperature of solutions in the tanks shall be maintained within the range of 60° F to 80° F (16° C to 27° C). Film shall be developed in accordance with the time-temperature relationships recommended by the film manufacturer, or, in the absence of such recommendations, with the following time-temperature chart; and

Manual Film Developing Technique Chart				
Developer Temperature °C / °F	Developing Time (Minutes)		Developer Temperature °C / °F	Developing Time (Minutes)
26.7 / 80	2.0		20.6 / 69	4.5
26.1 / 79	2.0		20.0 / 68	5.0
25.6 / 78	2.5		19.4 / 67	5.5
25.0 / 77	2.5		18.9 / 66	5.5

24.4 / 76	3.0		18.3 / 65	6.0
23.9 / 75	3.0		17.8 / 64	6.5
23.3 / 74	3.5		17.2 / 63	7.0
22.8 / 73	3.5		16.7 / 62	8.0
22.2 / 72	4.0		16.1 / 61	8.5
21.7 / 71	4.0		15.6 / 60	9.5
21.1 / 70	4.5			

(iv) Devices shall be utilized which will indicate the actual temperature of the developer solution and signal the passage of a preset time.

(b) Automatic processors and other closed processing systems:

(i) Automatic processors shall be operated and maintained following manufacturer specifications.

(ii) Films shall be developed in accordance with the time-temperature relationships recommended by the film manufacturer; in the absence of such recommendations, the film shall be developed using the following chart:

Developer Temperature		Minimum Immersion Time ^{a/}
°C	°F	Seconds
35.5	96	19
35	95	20
34.5	94	21
34	93	22
33.5	92	23
33	91	24
32	90	25
31.5	89	26
31	88	27
30.5	87	28
30	86	29
29.5	85	30
<i>a/ Immersion time only, no crossover time included.</i>		

(iii) Processing deviations from the requirements of Paragraph 2 of Subsection B of this section shall be documented by the registrant in such manner that the requirements are shown to be met or exceeded (e.g., extended processing, and special rapid chemistry).

(3) Additional requirements for facilities using x-ray film.

(a) Pass boxes, if provided, shall be so constructed as to exclude light from the darkroom when cassettes are placed in or removed from the boxes, and shall incorporate adequate shielding from stray radiation to prevent exposure of undeveloped film.

1 (b) Darkrooms typically used by more than one individual shall be provided a
2 method to prevent accidental entry while undeveloped films are being handled or processed.

3 (c) Film shall be stored in a cool, dry place and shall be protected from exposure to
4 stray radiation. Film in open packages shall be stored in a light tight container.

5 (d) Film cassettes and intensifying screens shall be inspected periodically and shall
6 be cleaned and replaced as necessary.

7 (e) Outdated x-ray film shall not be used for diagnostic radiographs.

8 (f) The film and intensifying screen shall be spectrally compatible.

9 (g) Facilities shall maintain a light-tight darkroom, use proper safelighting and
10 safeguards, and evaluate darkroom integrity and daylight loading systems for film fog every six months and after a
11 change that may impact film fog.

12 (h) Facilities other than dental, podiatry, and veterinary shall:

13 (i) have a continuous and documented sensitometric quality control
14 program, including quality control tests for speed, contrast and fog, which shall be performed according to
15 specifications of the manufacturer, a QMP [QE], or a nationally recognized organization;

16 (ii) maintain a light-tight darkroom and use proper safelighting and
17 safeguards such that any film type in use exposed in a cassette to x-radiation sufficient to produce an optical density
18 from 1 to 2 when processed shall not suffer an increase in optical density greater than 0.1 when exposed in the
19 darkroom for 2 minutes with all safelights on. If used, daylight film handling boxes shall preclude fogging of the
20 film; and

21 (iii) limit the base plus fog of unexposed film to an optical density less than
22 0.25 when developed by the routine procedure used by the facility.

23 (4) Facilities Using Computed Radiography (CR) or Direct Digital Radiography (DDR).

24 (a) When exposure indicators are available, the facility shall establish and document
25 an acceptable range for the exposure values for examinations routinely performed at the facility. The indicated
26 exposure values for each image shall be compared to the established range. Consistent deviations from established
27 ranges shall be investigated, corrective actions taken as necessary, and results documented.

28 (b) Facilities shall establish and follow an image quality control program in accord
29 with the recommendations of a QMP [QE], the system manufacturer, or a nationally recognized organization.

30 (c) Facilities other than dental, podiatric and veterinary, shall quarterly complete
31 phantom image evaluation using a phantom approved by a QMP [QE], system manufacturer, or the department. The
32 analysis at a minimum shall include: artifacts, spatial resolution, contrast/noise, workstation monitors, and exposure
33 indicator constancy.

34 (d) In addition CR facilities shall perform erasure of all CR cassettes, at least on a
35 weekly basis.

36 ~~[B.]~~ [C.] Plan review:

37 (1) Prior to construction, the floor plans and equipment arrangement of all installations (new
38 or modifications of existing installations) utilizing x-rays for diagnostic or therapeutic purposes, shall be submitted
39 to the department for review and approval. The required information is denoted in 20.3.2.213 NMAC and
40 20.3.2.214 NMAC [~~now 20.3.6.610 NMAC and 20.3.6.611 NMAC~~].

41 (2) The department may require the applicant to utilize the services of a qualified expert to
42 determine the shielding requirement prior to the plan review and approval.

43 (3) The approval of such plans shall not preclude the requirement of additional modifications
44 should a subsequent analysis of operating conditions indicate the possibility of an individual receiving a dose in
45 excess of the limits prescribed in 20.3.4.405 NMAC to 20.3.4.414 NMAC [~~now 20.3.4.405 to 20.3.4.412 NMAC~~].

46 (4) For all medical facilities in hospitals or clinics, interlocks shall be required on all doors
47 leading into diagnostic x-ray rooms when the doors cannot be seen by the operator at the control station.

48 ~~[C.] [Chemicals, film processing and darkroom will be complied with in accordance with Subpart 6,~~
49 ~~Section 612 (now 20.3.6.612 NMAC).~~

50 D. Digital radiographic systems shall be evaluated by a QMP [QE] within 30 calendar days of clinical
51 use, after repair or maintenance by or under the direction of a QMP [QE] at intervals not to exceed 12 months unless
52 otherwise determined by the department. The evaluation shall follow those recognized by the department.

53 E. Exemptions.

54 (1) Dental facilities. Dental facilities performing only intra-oral, panoramic, cephalometric or
55 volumetric dental imaging are exempt from the following provisions: Paragraph (10) of Subsection A of this section

(information available to referring physician), Subparagraph (e) of Paragraph (1) of Subsection B of this section (repeat analysis) and subsection D of this section. (evaluation)

(2) Podiatry facilities. Podiatry facilities are exempt from the following provisions of this Section: Paragraph (11) of Subsection A of this section (information available to referring physician) and Subparagraph (e) of Paragraph (1) of Subsection B of this section (repeat analysis).

(3) Veterinary facilities. Veterinary facilities are exempt from the following provisions of this Section: Paragraph (6) of Subsection A of this section (X-Ray Chart), Paragraph (10) of Subsection A of this section (information available to referring physician), Paragraph (11) of Subsection A of this section NMAC (use of reference levels), Paragraph 16 of Subsection A of this section (dose reduction), Paragraph 17 of Subsection A of this section (patient identification), Subparagraph d Paragraph (20) of Subsection A of this section (routine holding of patient), Paragraph 26 of Subsection A of this section (X-Ray Log), Paragraph (27) of Subsection A of this section (healing arts screening), Paragraph (1) of Subsection B of this section (quality assurance), subparagraph h of paragraph (3) Subsection B of this section (use of sensitometric equipment) and Subsection D of this section (evaluation).

[[5/3/95; Recompiled 11/27/04] 20.3.6.602 NMAC – Rp 20.3.6.602 NMAC, xx/xx/2026]

20.3.6.603 GENERAL REQUIREMENTS FOR ALL DIAGNOSTIC X-RAY SYSTEMS: ~~In addition to other requirements of this subpart (now part), all diagnostic x ray systems shall meet the following requirements:~~

A. Warning label: The control panel containing the main power switch shall bear the warning statement, legible and accessible to view: “WARNING: This X ray Unit May Be Dangerous To Patient and Operator Unless Safe Exposure Factors and Operating Instructions Are Observed”.

B. Battery charge indicator: On battery powered generators, visual means shall be provided on the control panel to indicate whether the battery is in a state of charge adequate for proper operation.

C. Leakage radiation from the diagnostic source assembly: The leakage radiation from the diagnostic source assembly measured at a distance of 1 m in any direction from the source shall not exceed 100 mR (1 mSv) in 1 hour when the x ray tube is operated at its leakage technique factor. Compliance shall be determined by measurements averaged over an area of 100 sq cm (39.37 inches) with no linear dimension greater than 20 cm (7.87 inches).

D. Radiation from components other than the diagnostic source assembly: The radiation emitted by a component other than the diagnostic source assembly shall not exceed 2 mR (2 mSv) in 1 hour at 5 cm from any accessible surface of the component when it is operated in an assembled x ray system under any conditions for which it was designed. Compliance shall be determined by measurements averaged over an area of 100 sq cm (39.37 inches) with no linear dimension greater than 20 cm (7.87 inches).

E. Beam quality:

(1) Half value layer:

(a) The half value layer (HVL) of the useful beam for a given x ray tube potential shall not be less than the values shown in Table 603.1. If it is necessary to determine such half value layer at an x ray tube potential which is not listed in Table 603.1, linear interpolation or extrapolation may be made.

Table 603.1

Design operating range (Kilovolts peak)	Measured potential (Kilovolts peak)	Half value layer (Millimeters of aluminum)
Below 50	30	0.3
	40	0.4
	49	0.5
50 to 70	50	1.2
	60	1.3
	70	1.5
Above 70	71	2.1
	80	2.3
	90	2.5
	100	2.7
	110	3.0
	120	3.2

130	3.5
140	3.8
150	4.1

(b) The above HVL criteria will be considered to have been met if it can be demonstrated that the aluminum equivalent of the total filtration in the primary beam is not less than that shown in Table 603.2.

TABLE 603.2

FILTRATION REQUIRED vs. OPERATING VOLTAGE	
Operating voltage (kVp)	Total filtration (inherent plus added) (millimeters aluminum equivalent)
Below 50	0.5 mm
50—70—	1.5 mm
Above 70	2.5 mm

(e) Beryllium window tubes shall have a minimum of 0.5 mm aluminum equivalent filtration permanently mounted in the useful beam.

(d) For capacitor energy storage equipment, compliance shall be determined with the maximum quantity of charge per exposure.

(e) The required minimal aluminum equivalent filtration shall include the filtration contributed by all materials which are always present between the focal spot of the tube and the patient (e.g., a tabletop when the tube is mounted “under the table” and inherent filtration of the tube).

(2) Filtration control: For x-ray systems manufactured after August 1, 1974, which have variable kVP and variable filtration for the useful beam, a device shall link the kVP selector with the filter(s), and will prevent an exposure, unless the minimum required amount of filtration (see Table 603.1 or Table 603.2 above) is in the useful beam for the given kVP which has been selected.

F. Multiple tubes: Where two or more radiographic tubes are controlled by one exposure switch, the tube or tubes which have been selected shall be clearly indicated prior to initiation of the exposure. This indication shall be both on the x-ray control and at or near the tube housing assembly which has been selected.

G. Mechanical support of tube head: The tube housing assembly supports shall be adjusted such that the tube housing assembly will remain stable during an exposure, unless the tube housing movement is a designed function of the x-ray system.

H. Technique indicators:

(1) The technique factors to be used during an exposure shall be indicated before the exposure begins, except when automatic exposure controls are used, in which case the technique factors which are set prior to the exposure shall be indicated.

(2) On equipment having fixed technique factors, the requirement, Section 603.H.1 (now Paragraph (1) of Subsection H of 20.3.6.603 NMAC), may be met by permanent markings. Indication of technique factors shall be visible from the operator’s position, except in the case of spot films by the fluoroscopist.] The regulations of the U.S. food and drug administration set forth in 21 CFR 1020.30 and 21 CFR 1020.31 are hereby incorporated by reference.

[5/3/95; Recompiled 11/27/01] 20.3.6.603 NMAC – Rp 20.3.6.603 NMAC, xx/xx/2026]

20.3.6.604 FLUOROSCOPIC X-RAY SYSTEMS: [All fluoroscopic x-ray systems shall meet the following requirements: The provisions of this Part apply to equipment for fluoroscopic imaging or for recording images from the fluoroscopic image receptor. (21CFR1020.32)]

A. Limitation of useful beam:

(1) The fluoroscopic tube shall not produce x-rays, unless the primary protective barrier is in position to intercept the entire useful beam at all times.

(2) The entire cross section of the useful beam shall be intercepted by the primary protective barrier of the fluoroscopic image assembly at any SID.

(3) Limitation to the imaging surface:

(a) Non-image intensified fluoroscopy and spot filming: The x ray field produced by non-image intensified fluoroscopic equipment shall not extend beyond the entire visible area of the image receptor. This requirement applies to field size during both fluoroscopic procedures and spot filming procedures.

(b) Image intensified fluoroscopy and spot filming:

(i) During fluoroscopic or spot filming procedures, neither the length nor the width of the x ray field in the plane of the image receptor shall exceed the visible area of the image receptor by more than 3 percent of the SID. The sum of the excess length and the excess width shall be no greater than 4 percent of the SID.

(ii) Compliance shall be determined with the beam axis perpendicular to the image receptor. For rectangular x ray fields used with circular image reception, the error in alignment shall be determined along the length and width dimensions of the x ray field, which pass through the center of the visible area of the image receptor.

B. Activation of the fluoroscopic tube: X ray production in the fluoroscopic mode shall be controlled by a device which requires continuous pressure by the fluoroscopist for the entire time of any exposure. When recording serial fluoroscopic images, the fluoroscopist shall be able to terminate the x ray exposure(s) at any time, but means may be provided to permit completion of any single exposure of the series in process.

C. Entrance exposure rate allowable limits:

(1) The exposure rate measured at the point where the center of the useful beam enters the patient shall not exceed 10 R per minute, (2.58 mC/kg), except during recording of fluoroscopic images or when provided with optional high level control.

(2) When provided with optional high level control, the equipment shall not be operable at any combination of tube potential and current, which will result in an exposure rate in excess of 5 rem (1.29 mC/kg) per minute at the point where the center of the useful beam enters the patient, unless the high level control is activated. A continuous signal audible to the fluoroscopist shall indicate that the high level control is being employed.

(3) Measuring compliance of entrance exposure rate limits: Compliance with Section 604.C (now Subsection C of 20.3.6.604 NMAC) shall be determined by:

(a) removing movable grids and compression devices from the useful beam during the measurements;

(b) if the source is below the table, express exposure rate, 1 cm above the tabletop or cradle;

(c) express exposure rate, if the source is above the table, 30 cm above the tabletop with the end of the beam limiting device or spacer positioned as closely as possible to the point of measurement; and

(d) in a C arm type of fluoroscope, the exposure rate shall be measured, 30 cm (11.81 inches) from the input surface of the fluoroscopic imaging assembly.

(4) Periodic measurement of entrance exposure rate limits:

(a) Periodic measurements of the exposure rate shall be made by a qualified expert. An adequate period for such measurements shall be annually or after any maintenance of the system which might affect the exposure rate.

(b) Results of these measurements shall be posted where any fluoroscopist may have ready access to such results while using that fluoroscope and in the record required in Section 602.A.2.e (now Subparagraph (e) of Paragraph (2) of Subsection A of 20.3.6.602 NMAC). Results of the measurements shall include the maximum possible rem/per minute, (1.29 mC/kg), as well as the physical factors used to determine all data; the name of the person performing the measurements; and the date the measurements were performed.

(c) Use of monitoring devices (e.g., commercially available film badges, thermoluminescent dosimeters, or low energy dosimeters) may be used to perform the test, provided the measurements are made as noted in Section 604.C.4.d (now Subparagraph (d) of Paragraph (4) of Subsection C of 20.3.6.604 NMAC).

(d) Conditions of measurement:

(i) the measurement shall be made under the conditions that satisfy the requirements of Section 604.C.3 (now Paragraph (3) of Subsection C of 20.3.6.604 NMAC);

(ii) the kVp shall be the peak Kv that the x ray system is capable of producing;

(iii) the high level control, if present, shall not be activated;
(iv) the x ray systems that do not incorporate automatic exposure control (automatic brightness control, etc.) shall have sufficient material (e.g., lead or lead equivalence) placed in the useful beam to produce the maximum milliamperage of the x ray system; and
(v) x ray systems that incorporate automatic exposure control shall utilize the maximum milliamperage of the x ray system; materials (e.g., an attenuation block) may be placed in the useful beam to protect the imaging system.

D. Barrier transmitted radiation rate limits:

(1) The exposure rate due to transmission through the primary protective barrier with the attenuation block in the useful beam combined with radiation from the image intensifier, if provided, shall not exceed 2 mR (0.516 mC/kg) per hour at 10 cm (3.93 inches) from any surface of the fluoroscopic imaging assembly beyond the plane of the image receptor for each roentgen per minute of entrance exposure rate.

(2) Measuring compliance of barrier transmission:

(a) The exposure rate due to transmission through the primary protective barrier, combined with radiation from the image intensifier, shall be determined by measurements averaged over an area of 100 sq cm with no linear dimension greater than 20 cm (7.87 inches).

(b) If the source is below the tabletop, the measurement shall be made with the input surface of the fluoroscopic imaging assembly, positioned 30 cm (11.81 inches) above the tabletop.

(c) If the source is above the tabletop and the SID is variable, the measurement shall be made with the end of the beam limiting device or spacer as close to the tabletop as it can be placed, provided that it shall not be closer than 30 cm (11.81 inches).

(d) Movable grids and compression devices shall be removed from the useful beam during the measurement.

(e) The attenuation block shall be positioned in the useful beam 10 cm (3.93 inches) from the point of measurement of entrance exposure rate and between this point and the input surface of the fluoroscopic imaging assembly.

E. Indication of potential and current: During fluoroscopy and cinefluorography, x ray tube potential and current shall be continuously indicated.

F. Source-skin distance: The source to skin distance shall not be less than:

(1) 38 cm (14.96 inches) on stationary fluoroscopes installed after March 10, 1989;
(2) 35.5 cm (13.98 inches) on stationary fluoroscopes which are in operation prior to March 10, 1989;

(3) 30 cm (11.81 inches) on all mobile fluoroscopes; and

(4) 20 cm (7.87 inches) for image intensified fluoroscopes used for specific surgical application; the users operating manual must provide precautionary measures to be adhered to during the use of this device.

G. Fluoroscopic timer:

(1) Means shall be provided to preset the cumulative on-time of the fluoroscopic tube. The maximum cumulative time of the timing device shall not exceed 5 minutes without resetting.

(2) A signal audible to the fluoroscopist shall indicate the completion of any preset cumulative on-time. Such signal shall continue to sound while x-rays are produced until the timing device is reset.

H. Mobile fluoroscopes: In addition to the other requirements of Section 604 (now 20.3.6.604 NMAC), mobile fluoroscopes shall provide intensified imaging.

I. Control of scattered radiation:

(1) Fluoroscopic table designs, when combined with procedures utilized, shall be such that no unprotected part of any staff or ancillary person's body shall be exposed to unattenuated scattered radiation which originates from under the table. The attenuation required shall be not less than 0.25 mm lead equivalent.

(2) Equipment configuration, when combined with procedures, shall be such that no portion of any staff or ancillary person's body, except the extremities, shall be exposed to the unattenuated scattered radiation emanating from above the tabletop unless that individual:

(a) is at least 120 cm (47.24 inches) from the center of the useful beam; or

(b) the radiation has passed through not less than 0.25 mm lead equivalent material (e.g., drapes, bucky slot cover, sliding or folding panel, or self supporting curtains) in addition to any lead equivalency provided by the protective apron referred to in Section 602 A.1.e.(2) (now Item (ii) of Subparagraph (c) of Paragraph (1) of Subsection A of 20.3.6.602 NMAC); and

(e) exceptions to Section 604.I.2 (now Paragraph (2) of Subsection I of 20.3.6.604 NMAC) may be made in some special procedures where a sterile field will not permit the use of the normal protective barriers; where the use of the pre fitted sterilized cover for the barriers is practical, the department shall not permit such exception.] The regulations of the U.S. food and drug administration set forth in 21 CFR 1020.30 and 21 CFR 1020.32 are hereby incorporated by reference.
[5/3/95; Recompiled 11/27/01] 20.3.6.604 NMAC – Rp 20.3.6.604 NMAC, xx/xx/2026]

20.3.6.605 [RADIOGRAPHIC SYSTEMS, OTHER THAN FLUOROSCOPIC, DENTAL, INTRAORAL OR VETERINARIAN, OR COMPUTED TOMOGRAPHY X RAY SYSTEMS:

A. Beam limitation: The useful beam shall be limited to the area of clinical interest.

(1) General purpose stationary and mobile x ray systems:

(a) Variable field limitation: There shall be provided a means for stepless adjustment of the size of the x ray field. The minimum field size at a SID of 100 cm shall be equal to or less than 5 cm (1.96 inches) by 5 cm (1.96 inches).

(b) Visual definition: Means shall be provided for visually defining the perimeter of the x ray field. The total misalignment of the edges of the x ray field along either the length or width of the visually defined field shall not exceed 2 percent of the distance from the source to the center of the visually defined field when the surface upon which it appears is perpendicular to the axis of the x ray beam.

(2) Additional requirements for stationary general purpose x ray systems: In addition to the requirements in Section 605.A.1 (now Paragraph (1) of Subsection A of 20.3.6.605 NMAC) above, all stationary x-ray systems shall:

(a) provide means to indicate when the axis of the x ray beam is perpendicular to the plane of the image receptor, to align the center of the x ray field with respect to the center of the image receptor to within 2 percent of the SID, and to indicate the SID to within 2 percent;

(b) be equipped with a beam limiting device that numerically indicates the field size in the plane of the image receptor to which it is adjusted; and

(c) indicate field size dimensions and SID's in inches or cm, and shall be such that aperture adjustments result in x ray field dimensions in the plane of the image receptor which correspond to those of the image receptor to within 2 percent of the SID when the beam axis is perpendicular to the plane of the image receptor.

(3) X ray systems designed for one image receptor size: Radiographic equipment designed for only one image receptor size at a fixed SID shall be provided with means to limit the field at the plane of the image receptor to dimensions no greater than those of the image receptor, and to align the center of the x ray field with the center of the image receptor to within 2 percent of the SID.

(4) Special purpose x ray systems:

(a) shall be provided with means to limit the x ray field in the plane of the image receptor so that such field does not exceed each dimension of the image receptor by more than 2 percent of the SID when the axis of the x ray beam is perpendicular to the plane of the image receptor;

(b) shall be provided with means to align the center of the x ray field with the center of the image receptor to within 2 percent of the SID;

(c) the above Sections 605.A.4.a and 605.A.4.b (now Subparagraphs (a) and (b) of Paragraph (4) of Subsection A of 20.3.6.605 NMAC) may be met with a system that meets the requirements for a general purpose x ray system as specified in Section 605.A.1 (now Paragraph (1) of Subsection A of 20.3.6.605 NMAC) above or, when alignment means are also provided, may be met with either:

(i) an assortment of removable, fixed aperture, beam limiting devices sufficient to meet the requirements for each combination of image receptor size and SID for which the unit is designed (each such device shall have clear and permanent markings to indicate the image receptor size and SID for which it is designed); or

(ii) a beam limiting device having multiple fixed apertures sufficient to meet the requirements for each combination of image receptor size and SID for which the unit is designed; permanent, clearly legible markings shall indicate the image receptor size and SID for which each aperture is designed and shall indicate which aperture is in position for use.

B. Radiation exposure control devices:

(1) Timers: Means shall be provided to terminate the exposure at a preset time interval, preset product of current and time, a preset number of pulses, or a preset radiation exposure to the image receptor. In addition:

(a) termination of exposure shall cause automatic resetting of the timer to its initial setting or to zero; and
 (b) it shall not be possible to make an exposure when the timer is set to a zero or off position if either position is provided.

(2) X-ray control (exposure switch):
 (a) A control shall be incorporated into each x-ray system such that an exposure can be terminated at any time, except for:

- (i) exposure of one half second or less; or
- (ii) during serial radiography, when means shall be provided to permit completion of any single exposure of the series in process.

 (b) Each x-ray control shall:

- (i) for stationary x-ray systems, be permanently mounted in a protected area so that the operator is required to remain in that protected area during the entire exposure;
- (ii) mobile and portable x-ray systems which are: 1) used for greater than one week in one location (one room or suite) shall meet the requirements of Section 605.B.2.b.(1) (now Item (i) of Subparagraph (b) of Paragraph (2) of Subsection B of 20.3.6.605 NMAC) above; 2) used for more than 1 hour and less than 1 week at one location (one room or suite) shall meet the requirement of Section 605.B.2.b.(2)(a) (now Item (ii) of Subparagraph (b) of Paragraph (2) of Subsection B of 20.3.6.605 NMAC), or be provided with 1.98 m (6.5 feet) high protective barrier which is placed at least 1.83 m (6 feet) from the tube housing assembly, and at least 1.83 m (6 feet) from the patient; or 3) used to make an exposure(s) of only one patient at the use location shall meet the requirement of Section 605.B.2.b.(2)(a) (now Item (ii) of Subparagraph (b) of Paragraph (2) of Subsection B of 20.3.6.605 NMAC), or Section 605.B.2.b.(2)(b) (now Item (ii) of Subparagraph (b) of Paragraph (2) of Subsection B of 20.3.6.605 NMAC); or be provided with a method of control which will permit the operator to be at least 3.66 m (12 feet) from the tube head assembly during an exposure;
- (iii) the x-ray control shall provide visual indication observable at or from the operator's protected position whenever x-rays are produced; in addition, a signal audible to the operator shall indicate that the exposure has terminated.

 (3) Automatic exposure controls (phototimer): When an automatic exposure control is provided:

- (a) indication shall be made on the control panel when this mode of operation is selected;
- (b) when the x-ray tube potential is equal to or greater than 50 kVp, the minimum exposure time for field emission equipment rated for pulsed operation shall be equal to or less than a time interval equivalent to two pulses;
- (c) the minimum exposure time for all equipment, other than specified in Section 605.B.3.b (now Subparagraph (b) of Paragraph (3) of Subsection B of 20.3.6.605 NMAC), shall be equal to or less than 1/60 second or a time interval required to deliver 5 mAs, whichever is greater;
- (d) either the product of peak x-ray tube potential, current and exposure time shall be limited to not more than 60 kW per exposure, or the product of x-ray tube current and exposure time shall be limited to not more than 600 mAs per exposure, except when the x-ray tube potential is less than 50 kVp, in which case the product of x-ray tube current and exposure time shall be limited to not more than 2000 mAs per exposure; and
- (e) a visible signal shall indicate when an exposure has been terminated at the limits described in Section 605.B.3.d (now Subparagraph (d) of Paragraph (3) of Subsection B of 20.3.6.605 NMAC), and manual resetting shall be required before further automatically timed exposures can be made.

 (4) Reproducibility: With a timer setting of 0.5 seconds or less, the average exposure period (T) shall be greater than or equal to 5 times the maximum exposure period ($T_{\max}$) minus the minimum exposure period ($T_{\min}$) when 4 timer tests are performed: $T \geq 5(T_{\max} - T_{\min})$.

C. Source to source or receptor distance limitation: All radiographic systems shall be provided with a durable, securely fastened means to limit the source to skin distance to not less than 30 cm (11.81 inches). This can be met when the collimator or cone provides the required limits.

D. Exposure reproducibility: The exposure produced shall be reproducible to within the following criteria: When all technique factors are held constant, the coefficient of variation shall not exceed 0.10. This shall be deemed to have been met if when four exposures at identical technique factors are made that the value of the average exposure (E) is greater than or equal to five times the maximum exposure ($E_{\max}$), minus the minimum exposure ($E_{\min}$):

$$E > 5 (E_{\max} - E_{\min}).$$

E. ~~Standby radiation from capacitor energy storage equipment: Radiation emitted from the x ray tube when the exposure switch or timer is not activated shall not exceed a rate of 2 mR (20 mSv) per hour at 5 cm (1.96 inches) from any accessible surface of the diagnostic source assembly, with the beam limiting device fully open.]~~ **COMPUTED TOMOGRAPHY (CT) EQUIPMENT:** The regulations of the U.S. food and drug administration set forth in 21 CFR 1020.30 and 21 CFR 1020.33 are hereby incorporated by reference. ~~[[5/3/95; Recompiled 11/27/01] 20.3.6.605 NMAC – Rp 20.3.6.605 NMAC, xx/xx/2026]~~

20.3.6.606 [INTRAORAL DENTAL RADIOGRAPHIC SYSTEMS: In addition to the provisions of Sections 602 and 603 (now 20.3.6.602 NMAC and 20.3.6.603 NMAC), the requirements of this section apply to x-ray equipment and associated facilities used for dental radiography. Criteria for extraoral dental radiographic systems are covered in Section 605.

A. Source to skin distance: X ray systems designed for use with an intraoral image receptor shall be provided with means to limit source to skin distance to not less than:

- (1) 18 cm (7.09 inches) if operable above 50 kVp; or
- (2) 10 cm (3.93 inches) if not operable above 50 kVp.

B. Field limitation:

(1) Radiographic systems designed for use with an intraoral image receptor shall be provided with means to limit the x ray beam such that:

(a) if the minimum source to skin distance (SSD) is 18 cm (7.09 inches) or more, the x ray field, at the minimum SSD, shall be containable in a circle having a diameter of no more than 7 cm (2.76 inches); and

(b) if the minimum SSD is less than 18 cm, (7.09 inches) the x ray field, at the minimum SSD, shall be containable in a circle having a diameter of no more than 6 cm (2.36 inches).

C. Timers: Means shall be provided to terminate the exposure at a preset time interval, preset product of current and time, a preset number of pulses, or a preset radiation exposure to the image receptor. In addition:

(1) termination of exposure shall cause automatic resetting of the timer to its initial setting or to zero;

(2) it shall not be possible to make an exposure when the timer is to a zero or off position if either position is provided;

(3) Reproducibility: With a timer setting of 0.5 seconds or less, the average exposure period (T) shall be greater than or equal to 5 times the maximum exposure period ($T_{\max}$) minus the minimum exposure period ($T_{\min}$) when 4 timer tests are performed: $T > 5 (T_{\max} - T_{\min})$.

D. X-ray control (use of dead-man timers):

(1) A control shall be incorporated into each x ray system such that an exposure can be terminated at any time, except for exposures of one half second or less;

(2) Each x ray control shall be located in such a way as to meet the following criteria:

(a) for stationary x ray systems, it shall be required that the control switch be permanently mounted in a protected area (e.g., corridor outside the room) so that the operator is required to remain in that protected area during the entire exposure;

(b) for mobile and portable x ray systems which are:

(i) used for greater than 1 week in one location (one room or suite) shall meet the requirements of Section 606.D.2.a (now Subparagraph (a) of Paragraph (2) of Subsection D of 20.3.6.606 NMAC);

(ii) used for more than 1 hour and less than 1 week at one location (one room or suite) shall meet the requirements of Section 606.D.2.b.(1) (now Item (i) of Subparagraph (b) of Paragraph (2) of Subsection D of 20.3.6.606 NMAC), or be provided with 1.98 m (6.5 feet) high protective barrier which is placed at least 1.83 m (6 feet) from the tube housing assembly and at least 1.83 m (6 feet) from the patient;

(iii) used to make an exposure(s) of only one patient at the use location shall meet the requirement of Sections 606.D.2.b.(1) or 606.D.2.b.(2) (now Items (i) or (ii) of Subparagraph (b) of Paragraph (2) of Subsection D of 20.3.6.606 NMAC), or be provided with a method of control which will permit the operator to be at least 3.63 m (12 feet) from the tube head assembly during an exposure.

(3) The x ray control shall provide visual indication observable at or from the operator's protected position whenever x rays are produced. In addition, a signal audible to the operator shall indicate that the exposure has terminated.

~~(4) From the operator's position, the patient must be capable of being viewed directly or via mirrors.~~

~~E. Exposure reproducibility: The exposure produced shall be reproducible to within the following criteria: when all technique factors are held constant, the coefficient of variation shall not exceed 0.10. This shall be deemed to have been met if, when four exposures at identical technique factors are made, that the value of the average exposure (E) is greater than or equal to five times the maximum exposure (E_{max}) minus the minimum exposure (E_{min}): $E \geq 5(E_{\max} - E_{\min})$.~~

~~F. Operating controls:~~

~~(1) Patient and film holding devices shall be used when the techniques permit. The safety rules, required by Section 602.A.1.d (now Subparagraph (d) of Paragraph (1) of Subsection of 20.3.6.602 NMAC), shall list individual projections where holding devices cannot be utilized.~~

~~(2) Neither the tube housing nor the position indicating device shall be hand held during an exposure.~~

~~(3) The x-ray system shall be arranged and operated in such a manner that the useful beam at the patient's skin does not exceed the dimensions specified in Sections 606.B.1.a or 606.B.1.b (now Subparagraphs (a) or (b) of Paragraph (1) of Subsection B of 20.3.6.606 NMAC).~~

~~(4) Dental fluoroscopy shall be prohibited.] CABINET X-RAY SYSTEMS: The regulations of the U.S. federal drug administration set forth in 21 CFR 1020.30 and 21 CFR 1020.40 are hereby incorporated by reference.~~

~~[5/3/95; Recompiled 11/27/01] 20.3.6.606 NMAC – Rp 20.3.6.606 NMAC, xx/xx/2026]~~

20.3.6.607 THERAPEUTIC X-RAY INSTALLATIONS:

A. Equipment:

(1) The protective tube housing shall be of therapeutic type.

(2) Permanent diaphragms or cones for collimating the useful beam shall afford the same degree of protection as the tube housing. Adjustable or removable beam-defining diaphragms or cones shall transmit not more than five percent of the useful beam at the maximum kilovoltage and with maximum treatment filter.

(3) Filters shall be secured in place to prevent them from dropping out during treatment. The filter slot shall be so constructed that the radiation escaping through it does not exceed 1 R (0.258 mC/kg) per hour at 1 m (3.28 feet), or, if the radiation from the slot is accessible to the patient, 30 R (7.74 mC/kg) per hour at 5 cm (1.96 inches) from the external opening. Each removable filter shall be marked with its thickness and material.

(4) A filter indication system shall be used on all therapy machines using changeable filters. It shall be designed so as to permit easy recognition of any added filter in place. It shall indicate, from the control panel, the presence or absence of any filter.

(5) The x-ray tube shall be so mounted that it cannot turn or slide with respect to the housing aperture.

(6) Means shall be provided to immobilize the tube housing during stationary portal treatment.

(7) A device (e.g., an automatic timer exposure meter or dose meter) shall be provided to terminate the exposure after a preset time interval or preset exposure of dose limit. Means shall be provided for the operator to terminate the exposure at any time.

(8) Equipment utilizing shutters to control the useful beam shall have a shutter position indicator on the control panel.

(9) The control panel shall include a device (usually an ammeter) which will give positive indication of the production of x-rays whenever the x-ray tube is energized.

B. Structural shielding:

(1) All walls, floors and ceilings that can be struck by the useful beam shall be provided with primary barriers to the height of the ceiling. Low-voltage superficial therapy units only require a height of 2.1 m (6.88 feet).

(2) All walls, floors and ceilings that, because of restrictions in the orientation of the useful beam cannot be struck by the useful beam, shall be provided with secondary barriers to a minimum height of 2.1 m (6.88 feet).

(3) With equipment operating at voltages above 50 kVp, the required barriers shall be an integral part of the building.

(4) With equipment operating above 150 kVp, the control panel shall be within a protective booth equipped with an interlocked door, or located outside the treatment room.

(5) Interlocks shall be provided for x-ray therapy equipment capable of operating above 150 kVp so that, when any door of the treatment room is opened, either the machine will shut off automatically, or the radiation level within the room will be reduced to an average of not more than 2 mR (20 mSv) per hour and a maximum of 10 mR (100 mSv) per hour at a distance of 1 m (3.28 feet) in any direction from the target. After such shutoff or reduction in output, it shall be possible to restore the machine to full operation only from the control panel.

(6) Windows, mirror systems or closed-circuit television viewing screen shall be provided to permit continuous observation of the patient during irradiation, and shall be so located that the operator may see the patient and the control panel from the same position.

(7) Provision shall be made for oral communication with the patient from the control room.

(8) Treatment rooms to which access is possible through more than one entrance shall be provided with flashing warning lights in a readily observable position near the outside of all access doors, which will indicate when the useful beam is "on".

C. Operating procedure:

(1) All new facilities, and existing facilities not previously surveyed, shall have a protection survey made by or under the direction of a qualified expert. This also shall be done after any change in the facility which might produce a radiation hazard. The expert shall report his findings, in writing, to the person in charge of the facility and a copy of this report shall be transmitted to the department.

(2) The facility shall be operated in compliance with any limitations indicated by the protection survey.

(3) When a patient must be held in position for radiation therapy, mechanical supporting or restraining devices shall be used whenever feasible. If the patient must be held by an individual, that individual shall be adequately protected, and shall be positioned so that no part of the body will be struck by the useful beam, and that the body is as far as possible from the edge of the useful beam. The exposure of any individual used for this purpose shall be monitored.

(4) The output of each therapeutic x-ray machine shall be calibrated by, or under the direction of, a qualified expert. The calibration shall be repeated after any change in or replacement of components of the x-ray generating equipment which could cause a change in x-ray output. Check calibrations shall be made at least once a year thereafter. Records of calibration shall be maintained by the registrant.

~~[[5/3/95; Recompiled 11/27/01]]~~ 20.3.6.607 NMAC – Rp 20.3.6.607 NMAC, xx/xx/2026]

20.3.6.608 SPECIAL REQUIREMENTS FOR X-RAY THERAPY EQUIPMENT OPERATED AT POTENTIALS OF 60 kVp AND BELOW:

A. Equipment: All provisions of Section 607.A (now Subsection A of 20.3.6.607 NMAC) apply, except that the leakage radiation 5 cm (1.96 inches) from the surface to the tube housing shall not exceed 0.1 R/hr.

B. Operating procedures:

(1) Automatic timers shall be provided which will permit accurate presetting and termination of exposures as short as one second.

(2) In the therapeutic application of apparatus constructed with beryllium or other low-filtration windows, the registrant shall ensure that the unfiltered useful beam is blocked at all times, except when actually being used.

(3) Machines having an output of more than 1,000 R (100 Bq) per minute at any accessible place shall not be left unattended without the power being shut off at the main disconnect switch, in addition to the control panel switch.

(4) The tube-head shall not be hand-held during x-ray therapy.

~~[[5/3/95; Recompiled 11/27/01]]~~ 20.3.6.608 NMAC – Rp 20.3.6.608 NMAC, xx/xx/2026]

20.3.6.609 VETERINARY MEDICINE RADIOGRAPHIC INSTALLATIONS:

A. Equipment:

(1) The protective tube housing shall be of diagnostic type.

(2) Diaphragms or cones shall be provided for collimating the useful beam to the area of clinical interest, and shall provide the same degree of protection as is required of the housing.

(3) The total filtration permanently in the useful beam shall not be less than 0.5 mm aluminum equivalent for machines operating up to 50 kVp, 1.5 mm aluminum for machines operating between 50-70 kVp, and 2.5 mm aluminum equivalent for machines operating above 70 kVp.

(4) A device shall be provided to terminate the exposure after a preset time or exposure.

(5) A dead-man type of exposure switch shall be provided, together with an electrical cord of sufficient length, so that the operator can stand out of the useful beam and at least 1.8 m from the animal during all x-ray exposures.

B. Structural shielding: All wall, ceiling and floor areas shall be equivalent to or provided with applicable protective barriers as required in Sections 602.B.1 and 602.B.2 (now Paragraphs (1) and (2) of Subsection B of 20.3.6.602 NMAC).

C. Operating procedures:

(1) The operator shall stand well away from the useful beam and the animal during radiographic exposures.

(2) No individual, other than the operator, shall be in the x-ray room while exposures are being made, unless such individual's assistance is required.

(3) When an animal must be held in position during radiography, mechanical supporting or restraining devices should be used. If the animal must be held by an individual, that individual shall be protected with appropriate shielding devices, such as protective gloves and apron, and he shall so positioned that no part of his body will be struck by the useful beam. The exposure of any individual used for this purpose shall be monitored.

[5/3/95; Recompiled 11/27/01] 20.3.6.609 NMAC – Rp 20.3.6.609 NMAC, xx/xx/2026]

[20.3.6.610 APPENDIX A. INFORMATION ON RADIATION SHIELDING REQUIRED FOR PLAN REVIEWS:

A. In order for the department to provide evaluation, technical advice and official approval on shielding requirements for a radiation installation, the following information is needed:

(1) normal location of the radiation producing equipment's radiation port; port's travel and traverse limits; general direction(s) of the radiation beam; locations of all windows; locations of the operator's booth; location of the equipment's control console; distance from x ray tube to nearest primary barrier;

(2) structural composition and thickness of all walls, doors, partitions, floor(s) and ceiling(s) of room(s) concerned;

(3) height, floor to floor, of room(s) concerned;

(4) type of occupancy of all adjacent areas, inclusive of space above and below the room(s) concerned; for exterior walls, distance to the closest existing occupied area(s);

(5) kVp (kilovolt peak potential) and maximum mA (milliamperage) for each radiation machine; and

(6) type of examination(s) or treatment(s) performed with equipment (e.g., dental, orthodontal, chest, gastrointestinal, fluoroscopic, podiatry, fixed therapy, rotational therapy, etc.).

B. Information on anticipated workload used in shielding calculations must be provided. This must include for each radiation machine number of exposures/week and average duration of each exposure.

C. If services of a qualified radiation expert have been utilized, a copy of his report shall be submitted with plans. This report must show all basic assumptions (i.e., workload, occupancy and use factors, distance, etc.) used to determine the shielding requirements.]

[5/3/95; Recompiled 11/27/01]

[20.3.6.611 APPENDIX B: MINIMUM DESIGN REQUIREMENTS FOR AN X RAY MACHINE OPERATOR'S BOOTH:

A. Space requirements:

(1) The operator shall be allotted not less than 0.7 square m (7.5 square feet) of unobstructed floor space in the booth.

(2) The minimum space as indicated above may be any geometric configuration with no dimension of less than 61 cm (2 feet).

(3) The space shall be allotted excluding any encumbrance by the console, such as overhang or cables, or other similar encroachments.

(4) The booth shall be located or constructed such that unattenuated direct scatter radiation originating on the examination table or at the wall cassette not reach the operator's station in the booth.

(5) The booth walls shall be at least 2.1 m (7 feet) high, and shall be permanently fixed to the floor or other structure as may be necessary.

(6) When a door or movable panel is used as an integral part of the booth structure, it must have a permissive device which will prevent an exposure when the door or panel is not closed (this type of booth structure is not recommended).

B. Switch placement:

(1) The operator's switch for the radiographic machine shall be fixed within the booth.

(2) The switch shall be at least 1 m (40 inches) from any edge of the booth wall which is proximal to the examining table.

(3) The switch shall allow the operator to use the majority of the available viewing windows.

C. Viewing system requirements:

(1) Each booth shall have at least one viewing device which will:

(a) be so placed that the operator can view the patient during any exposure; and

(b) the device shall be so placed that he can have full view of any occupant of the room and should be so placed that he can view any entry into the room; and if any door, which allows access to the room, cannot be seen from the booth, then that door must have a permissive device controlling the exposure which will prevent the exposure if the door is not closed.

(2) When the viewing system is a window:

(a) it shall have a visible area of at least 930 square cm (1.5 square feet);

(b) the distance between the proximal edge of the window and the open edge of the booth shall not be less than 45.7 cm (18 inches); and

(c) the glass shall have the same lead equivalence as that required in the booths' wall in which it is to be mounted.

(3) When the viewing system is by mirrors, the mirror(s) shall be so located as to accomplish the general requirements as in above.

(4) When the viewing system is by electronic means (e.g., TV, etc.):

(a) the camera shall be so located as to accomplish the general requirements of Section 611.C.1 (now Paragraph (1) of Subsection C of 20.3.6.611 NMAC) above; and

(b) there shall be an alternative viewing system as a backup for electronic failure.]

[5/3/95; Recompiled 11/27/01]

20.3.6.610-20.3.6.611 [RESERVED]

20.3.6.612 APPENDIX [C](A): X-RAY FILM DEVELOPING: Time temperature chart:

Thermometer readings (Degrees)		Minimum developing times (Minutes)
27	F	2.0
	80	2.0
	79	2.5
	78	2.5
	77	3.0
24	76	3.0
	75	3.0
	74	3.5
	73	3.5
	72	4.0
22	71	4.0
	70	4.5
	69	4.5
	68	5.0
	67	5.5
20	66	5.5
	65	6.0
	64	6.5

16	63	7.0
	62	8.0
	61	8.5
	60	9.5

A. Processing of film: All films shall be processed in such a fashion as to achieve adequate sensitometric performance. This criterion shall be adjudged to have been met if either of the following items can be met:

(1) film manufacturers' published recommendations as regards time and temperature are followed; or

(2) each film shall be developed in accord with the time temperature chart.

B. Manual processing of film:

(1) Where film is developed manually, a system shall be available which consists of at least one three-sectional tank made of mechanically rigid, corrosion-resistant material (each section of which shall be constructed so as to retain its solution separation from the other two) and has the overall temperature-controlling capability of maintaining each solution such that the temperature of each solution will always fall within the range of 16 degrees C to 27 degrees C (60 degrees - 80 degrees F).

(2) Devices shall be available which will:

(a) give the actual temperature of the developer; and

(b) give an audible or visible signal, after a preset time (in minutes of duration).

(3) Chemical-film processing control:

(a) Chemicals shall be mixed in accord with the chemical manufacturer's recommendations.

(b) Developer replenisher shall be periodically added to the developer tank based on the area of the films which have been developed (e.g., 1 liter per 3100 in² of film or in accord with the recommendations of the chemical manufacturer). Solution may be removed from the tank to permit the addition of an adequate volume of replenisher.

(c) All processing chemicals shall be completely replaced at least every 3 months.

(d) At the time of the complete processing chemical change, a film shall be exposed to a density of approximately one, with one-half of the film being protected from the exposure. After full development, it will be maintained in the darkroom or vicinity, and at the beginning of each work day at least one test film or film strip (exposed under techniques identical with those used for the original test film) shall be compared with the original test film to evaluate the adequacy of developing results and base fog level.

C. Automatic processors and other closed processing systems:

(1) Preventive maintenance shall be performed on the unit, except for extended periods of nonuse, on a frequency basis which is not less than that schedule recommended by the manufacturer. In the event that no schedule is available from the manufacturer, a maintenance schedule shall be established which will preserve good film quality.

(2) After a full cleansing of the processor, a film shall be exposed to a density of approximately one, with one-half of the film protected from exposure. It will be developed and then kept near the unit and daily at least one test film (exposed under techniques identical with those used for the original test film) shall be compared with the original test film to evaluate the adequacy of the unit's developing capability and base fog level.

D. Darkrooms:

(1) Darkrooms shall be constructed so that film being processed, handled or stored will be exposed only to light which has passed through a safelight filter.

(2) The radiance and spectral emission of the safelight (bulb and filter combination) shall be such that film shall not be "fogged" above the base level when exposed for 1 minute at a distance of about 120 cm from the lamp(s). Film manufacturer's recommendations for a safelight and its placement shall be adjudged to meet this criterion.

[5/3/95; Recompiled 11/27/01] 20.3.6.612 NMAC – Rp 20.3.6.612 NMAC, xx/xx/2026]

20.3.6.613 - 20.3.6.699 [RESERVED]

HISTORY OF 20.3.6 NMAC:

20.3.6 NMAC – Rp 20.3.6. NMAC, xx/xx/2026

Pre-NMAC History: The material in this part was derived from that previously filed as follows:

EIB 73-2, Regulations for Governing the Health and Environmental Aspects of Radiation filed on 7/9/73;

EIB 73-2, Amendment 1, Regulations for Governing the Health and Environmental Aspects of Radiation filed on 4/17/78;

EIB RPR-1, Radiation Protection Regulations filed on 4/21/80;

EIB RPR-1, Amendment 1, Radiation Protection Regulations filed on 10/13/81;

EIB RPR-1, Amendment 2, Radiation Protection Regulations filed on 12/15/82; and

EIB RPR-1, Radiation Protection Regulations filed on 3/10/89.

History of Repealed Material: [RESERVED]

Other History:

EIB RPR 1, Radiation Protection Regulations, filed 3/10/89 renumbered and reformatted to 20 NMAC 3.1;

Radiation Materials and Radiation Machines, filed 4/3/95. 20 NMAC 3.1;

Radiation Materials and Radiation Machines, filed 6/17/99 internally renumbered and reformatted replaced 20 NMAC 3.1, filed 4/3/95.

The material in this part was derived from that previously filed as:

20 NMAC 3.1.Subpart 6, 20.3.6 NMAC, effective 11/27/01.

recompiled as 20.3.6 NMAC, effective 11/27/01.

TITLE 20 ENVIRONMENTAL PROTECTION
CHAPTER 3 RADIATION PROTECTION
PART 20 MEDICAL IMAGING AND RADIATION THERAPY LICENSURE

20.3.20.1 ISSUING AGENCY: Environmental Improvement Board.
[20.3.20.1 NMAC - Rp, 20.3.20.1 NMAC, 9/25/2018]

20.3.20.2 SCOPE: All individuals engaged in the practice of medical imaging and radiation therapy.
[20.3.20.2 NMAC - Rp, 20.3.20.2 NMAC, 9/25/2018]

20.3.20.3 STATUTORY AUTHORITY: Medical Imaging and Radiation Therapy Health and Safety Act, Sections 61-14E-1 to 61-14E-12 NMSA 1978, Section 74-1-8 NMSA 1978, and the Uniform Licensing Act, Sections 61-1-1 to 61-1-34 NMSA 1978.
[20.3.20.3 NMAC - Rp, 20.3.30.3 NMAC, 9/25/2018]

20.3.20.4 DURATION: Permanent.
[20.3.20.4 NMAC - Rp, 20.3.20.4 NMAC, 9/25/2018]

20.3.20.5 EFFECTIVE DATE: ~~[September 25, 2018]~~ October _____, 2026, unless a later date is cited at the end of a section.
[20.3.20.5 NMAC - Rp, 20.3.20.5 NMAC, 9/25/2018; A, XX/XX/2026]

20.3.20.6 OBJECTIVE: To maximize the protection practicable for the citizens of New Mexico from ionizing and non-ionizing radiation in the practice of medical imaging and radiation therapy by establishing requirements for appropriate education and training of individuals operating medical equipment emitting ionizing and non-ionizing radiation, establishing standards of education and training for the individuals who perform medical imaging and radiation therapy procedures, and providing for the appropriate examination and licensure of those individuals.
[20.3.20.6 NMAC - Rp 20.3.20.6 NMAC, 9/25/2018]

20.3.20.7 DEFINITIONS: As used in this part (20.3.20 NMAC).

A. "Act" means the Medical Imaging and Radiation Therapy Health and Safety Act, Sections 61-14E-1 to 61-14E-12 NMSA 1978.

B. "Advisory council" means the medical imaging and radiation therapy advisory council (MIRTAC).

C. "Applying ionizing radiation" means to use ionizing radiation for diagnostic or therapeutic purposes, including tasks having direct impact on the radiation burden of the patient, such as, but not limited to:

- (1) positioning the patient, image receptor, and beam;
- (2) selection of exposure factors or treatment parameters;
- (3) preparation, calibration, and injection of pharmaceuticals and radiopharmaceuticals in accordance with a licensee's scope of practice; and
- (4) actuating the production of radiation.

D. "Approved program" means a medical imaging or radiation therapy educational program that meets the requirements of 20.3.20.200 NMAC.

E. "Biennial licensure fee" means the licensure fee for an initial, renewal, and limited radiography license, excluding the temporary license, for a period up to 24 months, and is only applied once per continuing medical education biennium period regardless of the number of licenses granted to that registrant. This fee will be assessed each time a registrant submits an application packet to the department. Upon written request to the department, the registrant may reduce their NM biennium period to match their national continuing medical education biennium period.

F. "Board" means the environmental improvement board.

G. "Cardiac sonography" or "echocardiography" means an examination using ultrasound to generate an image of the heart or major blood vessels.

H. "Category A" means a continuing education activity approved for category A credit by an organization recognized by the American registry of radiologic technologists as a recognized continuing education evaluation mechanism.

I. “Certificate of licensure” means a document issued by the department that lists the type or types of license granted to an individual.

J. “Certificate of limited practice” or “limited practice of radiography license” means a limited license granted by the department to an individual other than a licensed practitioner or radiographer who performs restricted diagnostic radiography procedures under the direct supervision of a licensed practitioner or radiographer on designated anatomical sites or limited anatomical areas.

K. “Certified nurse practitioner” means a person licensed pursuant to Section 61-3-23.2 NMSA 1978.

L. “Chest and thorax” or “viscera of the thorax” means radiographic examinations of the ribs and lungs, including anteroposterior, posterior-anterior, lateral, and apical lordotic views, but does not include mammography.

M. “Clinical instruction” means hands-on educational experience in a health care setting such as a hospital, clinic, or physician’s office, under the supervision requirements consistent with the standards of the program’s accrediting agencies.

N. “Continuing education” (CE) or “continuing medical education” (CME) means a learning activity that is planned, organized, and administered to enhance the professional knowledge and skill of the licensee.

O. “Credential” or “certification” means the recognition awarded to an individual who meets the initial and ongoing requirements of a credentialing or certification organization.

P. “Credentialing organization” or “certification organization” means an organization accredited by the national commission for certifying agencies or the American national standards institute and recognized by the board that issues credentials through testing or evaluation and determines that an individual has met defined standards for training and competence in a medical imaging or radiation therapy modality and subspecialty.

Q. “Department” means the New Mexico environment department.

R. “Diagnostic medical sonographer” means a person, including a vascular technologist or echocardiographer, other than a licensed practitioner, who provides patient care services using ultrasound;

S. “Diagnostic medical sonography” or “sonogram” means the use of ultrasound and sonographic equipment to create medical images for interpretation by a licensed practitioner or other qualified health care practitioner that provide diagnostic information about a patient’s medical condition and includes obstetrical ultrasound. Obstetrical ultrasound means an ultrasound exam performed for the purpose of fetal biometry beyond the first trimester, fetal number, anatomic survey, or follow-up examination for a known or suspected anomaly or growth disturbance. It does not mean a procedure using ultrasound on a focused imaging target to assess specific and limited information about a patient’s immediate medical condition or to provide real-time visual guidance for another procedure.

T. “Didactic instruction” means academic instruction.

U. “Duplicate certificate of licensure” means an additional original certificate of licensure issued by the department.

V. “Extremities” means the fingers, hand, wrist, radius/ulna, elbow, humerus, pectoral girdle (shoulder joint and clavicle), toes, foot, ankle, calcaneus, tibia/fibula, patella, knee, or distal femur, but does not include the skull, spine, hip, or pelvis.

W. “Facility” means a hospital, clinic, medical office, mobile lab, or other location where medical imaging or radiation therapy is provided.

X. “Focused imaging target” means a discrete anatomical target, to which ultrasound is applied to create an image for assessment of specific and limited information about a patient’s immediate medical condition, or to provide visual guidance for another procedure. An ultrasound procedure on a focused imaging target does not supplant a diagnostic ultrasound examination.

Y. “General sonography” means an examination using ultrasound to create an image of the abdomen, chest, pelvis, pregnant uterus, small parts, or superficial structures.

Z. “Interventional” means to diagnose or treat patients using medical imaging devices. Interventional procedures may include, but are not limited to: radiation therapy, organ biopsy, angiography, angioplasty, and catheter delivered stents. Interventional does not mean needle or catheter placement for vascular access or delivery of medicine or anesthesia, or the use of non-ionizing energy for non-imaging therapeutic or treatment purposes.

AA. “Ionizing radiation” means gamma rays and x-rays, alpha and beta particles, high speed electrons, neutrons, protons, and other nuclear particles; but not ultrasound, sound, or radio waves, nor visible, infrared or ultraviolet light.

1 **AB. “License”** means a grant of authority issued by the department for an individual to perform
2 medical imaging or radiation therapy procedures.

3 **AC. “License term”** means a length of licensure as indicated on the certificate of licensure issued by
4 the department.

5 **AD. “Licensed practitioner”** means an individual licensed to practice medicine, dentistry, podiatry,
6 chiropractic or osteopathy in this state.

7 **AE. “Licensee”** means an individual who has met and continues to meet all requirements of the act
8 and this part.

9 **AF. “Licensure”** means the grant of authority by the department for an individual to perform medical
10 imaging or radiation therapy procedures.

11 **AG. “Limited practice radiography technologist”** means an individual who has been granted a
12 limited practice in radiography license by the department to perform restricted diagnostic radiography procedures
13 under the direct supervision of a licensed practitioner or radiographer.

14 **AH. “Lower leg”** means the knee and ankle and portions of the leg between the knee and ankle.

15 **AI. “Magnetic resonance imaging”** means an examination using magnetic fields and radio frequency
16 signals to generate an image.

17 **AJ. “Magnetic resonance technologist”** means an individual other than a licensed practitioner who
18 performs magnetic resonance imaging procedures under the supervision of a licensed practitioner using magnetic
19 fields and radio frequency signals.

20 **AK. “Medical imaging”** means the use of substances or equipment emitting ionizing or non-ionizing
21 radiation on humans for diagnostic or interventional purposes.

22 **AL. “Medical imaging professional”** means an individual who has been granted a license by the
23 department pursuant to the act in at least one medical imaging modality.

24 **AM. “Modality”** means the following medical imaging procedures or technologies:
25 (1) computed tomography and all of its subspecialties;
26 (2) diagnostic medical sonography and all of its subspecialties;
27 (3) magnetic resonance imaging and all of its subspecialties;
28 (4) nuclear medicine technology and all of its subspecialties;
29 (5) radiation therapy and all of its subspecialties; and
30 (6) radiography and all of its subspecialties.

31 **AN. “Musculoskeletal sonography” or “musculoskeletal ultrasound”** means an examination using
32 ultrasound to generate an image of a superficial muscle, tendon, ligament, or joint.

33 **AO. “Non-ionizing radiation”** means the static and time-varying electric and magnetic fields and
34 radio frequency, including microwave radiation and ultrasound.

35 **AP. “Nuclear medicine technologist”** means an individual, other than a licensed practitioner, who
36 performs nuclear medicine procedures, venipuncture, and compounds, calibrates, dispenses, and administers
37 pharmaceuticals, radiopharmaceuticals, and radionuclides under the supervision of a licensed practitioner.

38 **AQ. “Personal identification”** means an applicant’s or licensee’s full legal name, permanent and
39 mailing address, social security number, date of birth, home phone number, cellular telephone number, work
40 telephone number, electronic mail address, department registration number, and other related information.

41 **AR. “Phlebology”** means ultrasound examination of superficial veins in the lower extremities for the
42 identification and treatment of venous disease.

43 **AS. “Physician assistant”** means a person licensed and operating within their scope of practice
44 pursuant to Section 61-6-7 or 61-10A-4 NMSA 1978.

45 **AT. “Place of employment”** means a location with its own physical address or separated by building
46 structure regardless of ownership, company, nonprofit organization, or business name.

47 **AU. “Podiatric”** means radiographic examination of the toes, foot, ankle, calcaneus, distal tibia/fibula,
48 but does not include the knee joint.

49 **AV. “Programmatic accreditation”** means a specialized accreditation process that examines the
50 medical imaging or radiation therapy program within an educational institution.

51 **AW. “Radiation therapy”** means the use of high-energy particles or waves to destroy or damage cells.

52 **AX. “Radiation therapy technologist” or “radiation therapist”** means an individual, other than a
53 licensed practitioner, who utilizes ionizing radiation for the planning and delivery of therapeutic procedures to
54 humans under the supervision of a licensed practitioner.

55 **AY. “Radiographer”** means an individual, other than a licensed practitioner, who applies radiation to
56 humans for diagnostic purposes under the supervision of a licensed practitioner.

1 **AZ. “Radiography”** means the application of radiation to humans for diagnostic purposes, including
2 adjustment or manipulation of x-ray systems and accessories, including image receptors, positioning of patients,
3 processing of films and any other action that materially affects the radiation dose to patients.

4 **BA. “Radiologic technologist” or “radiation therapy technologist”** means a medical imaging or
5 radiation therapy professional licensed by the department in one or more of the imaging modalities.

6 **BB. “Radiologist”** means a licensed practitioner certified by the American board of radiology, the
7 British royal college of radiology, the American osteopathic board of radiology or the American chiropractic board
8 of radiology.

9 **BC. “Radiologist assistant”** means an individual licensed as a radiographer who holds additional
10 certification as a registered radiologist assistant by the American registry of radiologic technologists and who works
11 under the supervision of a radiologist; provided that a radiologist assistant shall not interpret images, render
12 diagnoses or prescribe medications or therapies.

13 **BD. “Recognized continuing education evaluation mechanism (RCEEM)”** means a recognition
14 mechanism of the ARRT for evaluating the content, quality, and integrity of a continuing education activity.

15 **BE. “Registration number”** means a number that is generated by the department to be used as a
16 unique identification number in place of that individual’s social security number. This number will remain the same
17 number throughout the individual’s lifetime.

18 **BF. “Remedial education” or “remedial training”** means additional education or training required
19 for an individual to re-qualify to take a state-administered examination for the limited practice of radiography.

20 **BG. “Scope of practice”** means nationally recognized practice standards as applicable to each medical
21 imaging modality and subspecialty, unless this part is superseded by the act.

22 **BH. “Small parts”** means superficial structures or anatomy including, but not limited to: axilla, chest
23 or abdominal wall, penis, scrotum or testicles, thyroid, parathyroid, and other non-vascular structures of the neck or
24 extremities.

25 **BI. “Sonographer” or “echocardiographer” or “vascular technologist”** means an individual other
26 than a licensed practitioner who applies ultrasound to humans for diagnostic and interventional purposes under the
27 supervision of a licensed practitioner.

28 **BJ. “Sonography” or “ultrasound”** means the use of high frequency sound waves (above 20,000
29 cycles per second) with specialized equipment to direct the sound waves into an area of the human body to generate
30 an image.

31 **BK. “Sonography subspecialty”** means an area of specialization recognized by the board, including:

- 32 (1) abdominal sonography;
- 33 (2) breast sonography;
- 34 (3) cardiac sonography;
- 35 (4) musculoskeletal sonography;
- 36 (5) obstetric/gynecology sonography;
- 37 (6) phlebology sonography; and
- 38 (7) vascular sonography.

39 **BL. “Student”** means an individual enrolled in and attending a school or college of medicine,
40 osteopathy, chiropractic, podiatry, dentistry, dental hygiene, an approved program in medical imaging or radiation
41 therapy, or an approved limited radiography program.

42 **BM. “Subspecialty”** means an area of specialization approved by the board within a medical imaging
43 or radiation therapy modality.

44 **BN. “Supervision”** means responsibility for and control of quality, radiation safety, and protection and
45 technical aspects of the application of ionizing and non-ionizing radiation to human beings for diagnostic or
46 therapeutic purposes. For the purposes of this Part, supervision shall consist of one of the following:

47 (1) ~~“direct supervision” [means the medical imaging or radiation therapy procedure is~~
48 ~~provided under the direction and control of a person authorized to provide supervision and the person’s physical~~
49 ~~presence must be present in the office suite or building and immediately available to furnish assistance and direction~~
50 ~~throughout the performance of the procedure. It does not mean that the supervisor must be present in the room when~~
51 ~~the procedure is performed.] means the procedure is performed under the direction and control of a individual~~
52 licensed by the department who:

- 53 (a) is physically present in the immediate clinical area;
- 54 (b) maintains continuous visual and situational awareness of the procedure; and
- 55 (c) is able to enter the procedure room and provide assistance immediately and

56 without delay.

(2) “indirect supervision” or “general supervision” ~~[means the medical imaging or radiation therapy procedure is provided under the direction and control of a person authorized to provide supervision, but the person’s presence is not required during the performance of the procedure. The training of the non-physician personnel and the maintenance of the necessary equipment and supplies are the continuing responsibility of the person authorized to provide supervision.]~~ means the procedure is performed under the overall direction and control of a licensed practitioner whose presence is not required during the performance of the procedure. The supervising individual remains responsible for the competency and training of personnel performing the procedure, and the condition and safe operation of the equipment used.

(3) ~~[student supervision requirements must be consistent with the medical imaging and radiation therapy standards of the programmatic accreditation agencies.]~~ Student supervision must ensure patient safety, educational integrity, and radiation protection. The supervising individual licensed by the department must maintain visual oversight or real-time monitoring of the portions of the procedure performed by the student, and be immediately available to provide direction, correction, or intervention as needed. Student supervision is not met when the supervisor is behind closed doors or in any location where the student’s performance cannot be observed or monitored

BO. “Temporary license” means a grant of authority by the department for an individual to perform medical imaging or radiation therapy procedures pursuant to the term and requirements of section 20.3.20.321 NMAC.

BP. “Vascular sonography” means an examination using ultrasound to generate an image of the peripheral or neck blood vessels.

BQ. “Viscera of the thorax” means radiographic examination of the lungs and mediastinum. [20.3.20.7 NMAC - Rp, 20.3.20.7 NMAC, 9/25/2018; A, xx/xx/2026]

20.3.20.8 ABBREVIATIONS AND ACRONYMS:

- A. “ANSI” stands for American national standards institute.
- B. “ARDMS” stands for the American registry for diagnostic medical sonography.
- C. “ARMRIT” stands for American registry of magnetic resonance imaging technologists.
- D. “ARRT” stands for the American registry of radiologic technologists.
- E. “BS” stands for breast sonography.
- F. “CAAHEP” stands for the commission on accreditation of allied health education programs.
- G. “CCI” stands for the cardiovascular credentialing international.
- H. “CHEA” stands for the council of higher education accreditation.
- I. “CNMT” stands for certified nuclear medicine technologist.
- J. “CS” stands for cardiac sonography.
- K. “CT” stands for computed tomography.
- L. “DMS” stands for diagnostic medical sonography.
- M. “FUS” stands for fusion imaging.
- N. “JRCDS” stands for the joint review committee on diagnostic medical sonography.
- O. “JRCERT” stands for the joint review committee on education in radiologic technology.
- P. “JRCNMT” stands for the joint review committee on educational program in nuclear medicine technology.
- Q. “LXE” stands for limited practice radiography to the extremities.
- R. “LXP” stands for limited practice radiography to the podiatric.
- S. “LXT” stands for limited practice radiography to the viscera of the thorax.
- T. “LXV” stands for limited practice radiography to the axial/appendicular skeleton.
- U. “MR” stands for magnetic resonance.
- V. “MRT” stands for magnetic resonance technologist.
- W. “MSK” stands for diagnostic musculoskeletal technologist.
- X. “NCCA” stands for national commission for certifying agencies.
- Y. “NMT” stands for nuclear medicine technologist.
- Z. “NMTCB” stands for the nuclear medicine technologist certification board.
- AA. “N” stands for nuclear medicine technology.
- AB. “PBS” stands for phlebology sonography.
- AC. “PET” stands for positron emission tomography.
- AD. “PVL” stands for provisional license.

- 1 **AE.** “RCCS” stands for registered congenital cardiac sonographer.
2 **AF.** “RCS” stands for registered cardiac sonographer.
3 **AG.** “RDCS” stands for registered diagnostic cardiac sonographer.
4 **AH.** “RDMS” stands for registered diagnostic medical sonographer.
5 **AI.** “RMRI” stands for magnetic resonance imaging technologist.
6 **AJ.** “RMSK” stands for registered in musculoskeletal sonography.
7 **AK.** “RPhS” stands for registered phlebology sonographer.
8 **AL.** “R” stands for radiography.
9 **AM.** “RRT” stands for radiographic radiologic technologist.
10 **AN.** “RRA” stands for registered radiology assistant.
11 **AO.** “R.T.” stands for registered technologist.
12 **AP.** “RTT” stands for radiation therapy technologist.
13 **AQ.** “RVS” stands for registered vascular specialist.
14 **AR.** “RVT” stands for registered vascular technologist.
15 **AS.** “S” stands for sonography.
16 **AT.** “TMP” stands for temporary.
17 **AU.** “T” stands for radiation therapy.
18 **AV.** “USDE” stands for United States department of education.
19 **AW.** “VS” stands for vascular sonography.

20 [20.3.20.8 NMAC - Rp, 20.3.20.8 NMAC, 9/25/2018]

21
22 **20.3.20.9 ADMINISTRATION AND ENFORCEMENT:** The administration and enforcement of the act
23 and this part (20.3.20 NMAC) is vested in the department.
24 [20.3.20.9 NMAC - N, 9/25/2018]

25
26 **20.3.20.10 - 20.3.20.99 [RESERVED]**

27
28 **20.3.20.100 LICENSE REQUIRED:**

29 **A. Unlawful acts.** It is unlawful for an individual, other than an individual licensed by the
30 department, or who is exempt under the provisions of the act, to:

- 31 (1) use ionizing or non-ionizing radiation for diagnostic, interventional, or therapeutic
32 purposes on humans;
33 (2) use any title, abbreviation, letters, figures, signs, or other devices to indicate the
34 individual is a medical imaging or radiation therapy professional; or
35 (3) engage in any of the medical imaging or radiation therapy modalities or subspecialties.

36 **B. Statutory ~~exceptions~~ exemptions.** Pursuant to the act, a medical imaging license is not
37 required for:

- 38 (1) a licensed practitioner;
39 (2) a student under the supervision of a licensed practitioner or under the direct supervision
40 of a licensed medical imaging or radiation therapy professional licensed in the modality and subspecialty in which
41 the student is performing the procedure;
42 (3) a health care practitioner licensed or certified by an independent board as defined by the
43 act that has been approved by the board as provided in Subsection C of this section; or
44 (4) a registered nurse or certified nurse-midwife performing ultrasound procedures; provided
45 that the registered nurse or certified nurse-midwife has documented demonstration of competency within the
46 registered nurse's scope of practice in compliance with board of nursing rules or certified nurse-midwife's scope of
47 practice in compliance with department of health rules. A registered nurse or certified nurse-midwife shall not
48 perform diagnostic ultrasound examinations or ionizing procedures, including radiography, radiation therapy,
49 nuclear medicine or a non-ionizing magnetic resonance procedure, unless licensed by the department as medical
50 imaging professional or radiation therapist professional. A registered nurse or a certified nurse-midwife may
51 perform ultrasound procedures limited to a focused imaging target. A focused imaging target includes, but is not
52 limited to:

- 53 (a) identification of an anatomical landmark or blood vessel;
54 (b) assessment of presence or absence of fluid in a body cavity;
55 (c) assessment of fetal presentation or heartbeat; or
56 (d) assessment of foreign body position or location.

(5) An accredited nuclear medicine technologist (Licensed by the state) who performs CT radiographic exams as part of a PET/CT or SPECT/CT combination exam.

C. An independent board or state regulatory body may submit an application for approval of their medical imaging certification and examination program to the MIRTAC for review.

(1) The MIRTAC shall consider whether the medical imaging and certification examination program adequately ensures the appropriate education, training, and clinical experience while ensuring patient health and safety and shall make a written recommendation to the board.

(2) The board may approve or deny an application based on whether or not it finds adequate evidence that the certification and examination program ensures appropriate education, training, and clinical experience while ensuring health and patient safety.

(3) The independent board or state regulatory body shall reapply to the board for re-approval if substantive changes to the certification and examination program are made subsequent to the board's approval.

D. **Temporary exemption.** The department may temporarily exempt applicants from licensure requirements upon determining that:

(1) the experience or training of the applicant is such that no apparent danger to the public exists;

(2) the people in the area of the state to be served by the applicant would otherwise be denied adequate medical care because of the unavailability of a medical imaging or radiation therapy professional; and

(3) each application for temporary exemption shall be supported by:

(i) an application for temporary exemption;

(ii) an application fee; and

(iii) written evidence to support the applicant's compliance with Paragraphs (1) and (2) of this Subsection.

E. **Temporary exemption term.** A temporary exemption approved by the board shall be for a limited period of time, not to exceed one year. A temporary exemption may be renewed if the circumstances have not changed and if deemed warranted by the department.

F. **Temporary exemption application denial.** The board, with the advice of the MIRTAC, shall resolve appeals of a denial of an application for temporary exemption pursuant to 20.3.20.600 NMAC. When making a determination of existence of community hardship, the board will:

(1) consult health agencies;

(2) evaluate availability of alternative medical imaging or radiation therapy services and licensed medical imaging or radiation therapy professionals; and

(3) evaluate documentation from the applicant's employer or prospective employer to demonstrate that recruitment of qualified individuals, at competitive compensation, has been attempted and was unsuccessful. Such demonstration may take the form of:

(a) documented advertising in publications pertaining to medical imaging professionals;

(b) registration of the position with the New Mexico department of workforce solutions or similar state agency; or

(c) documentation of current and past contracting with medical imaging or radiation therapy job placement companies.

[20.3.20.100 NMAC - N, 9/25/2018; A, XX/XX/2026]

20.3.20.101 SCOPE OF PRACTICE:

A. General provisions.

(1) A licensee's scope of practice is determined based upon the licensee's education, certification, and state and federal law.

(2) The following are the different scopes of practice for a licensee that will be recognized by the department:

(a) Radiography - the current version of the American society of radiologic technologists radiography practice standards;

(b) Radiation therapy - the current version of the American society of radiologic technologists radiation therapy practice standards;

(c) Nuclear medicine technology - the current version of the American society of radiologic technologists nuclear medicine practice standards or society of nuclear medicine and molecular imaging scope of practice for nuclear medicine technologist;

(d) Magnetic resonance technology - the current version of the American society of radiologic technologists magnetic resonance practice standards;

(e) Radiologist assistant - the current version of the American society of radiologic technologists radiologist assistant practice standards;

(f) Sonography - the current version of the American society of radiologic technologists sonography practice standards or the society of diagnostic medical sonography scope of practice and clinical standards for the diagnostic medical sonographer;

(g) Limited practice of radiography license or certificate of limited practice - the current version of the American society of radiologic technologists limited x-ray machine operator practice standards; or

(h) Computed Tomography-the current version of the American society of radiologic technologists computer tomography practice standards and the Society of Nuclear Medicine and Molecular Imaging.

B. Radiologist assistant. A radiologist assistant shall practice under the indirect supervision of a radiologist and shall not interpret images, render diagnoses, or prescribe medications or therapies. [20.3.20.101 NMAC - N, 9/25/2018; A, 04/19/2022]

20.3.20.102 - 20.3.20.199 [RESERVED]

20.3.20.200 APPROVED EDUCATIONAL PROGRAMS:

A. Approved program for a medical imaging or radiation therapy license: An approved program for medical imaging or radiation therapy includes:

(1) an educational program in a medical imaging or radiation therapy modality that is programmatically accredited by an accreditation agency recognized by the USDE or the CHEA and also recognized by the board pursuant to 20.3.20.220 NMAC; or

(2) an educational program in a medical imaging or radiation therapy modality that is in the process of preparing for programmatic accreditation by an accreditation agency recognized by the USDE or CHEA and also recognized by the board pursuant to 20.3.20.220 NMAC. This programmatic accreditation by an accreditation agency must be attained within five years of the effective date of this section or within five years of the establishment of a new educational program.

B. Approved program for a limited practice in radiography license: A limited radiography program shall be reviewed by the MIRTAC and approved by the board before enrolling students into the educational program. Prior to approval of the educational program, the MIRTAC will consider if the program includes the necessary didactic and clinical education to prepare students for the state examination for a limited practice in radiography license prior to submitting its recommendations to the board. Before enrolling students or offering courses, including clinical instruction, a limited radiography program shall submit an application to the department with supporting documentation to show compliance with this section and alignment with national educational accreditation standards. No fee is required for the application and, if all requirements are met, the department shall issue a letter to the educational program confirming compliance with this section. [20.3.20.200 NMAC - N, 9/25/2018]

20.3.20.201 - 20.3.20.219 [RESERVED]

20.3.20.220 RECOGNIZED PROGRAMMATIC ACCREDITATION ORGANIZATIONS:

A. Programmatic accreditation. To be recognized by the board, an educational program accreditation agency must:

(1) be recognized by the USDE or CHEA; and
(2) provide programmatic accreditation for the medical imaging or radiation therapy modality offered by the educational program.

B. Recognized programmatic accreditation organizations. Medical imaging or radiation therapy programmatic accreditation agencies recognized by the board include:

(1) CAAHEP;
(2) JRCERT; and
(3) JRCNMT.

[20.3.20.220 NMAC - N, 9/25/2018]

1 **20.3.20.221 - 20.3.20.299 [RESERVED]**

2
3 **20.3.20.300 RECOGNIZED CREDENTIALING ORGANIZATIONS:** The board recognizes the following
4 medical imaging and radiation therapy credentialing organizations in each modality defined by the act including:

- 5 **A.** computed tomography:
6 **(1)** ARRT[];or
7 **(2)** NMTCB.
8 **B.** diagnostic medical sonography:
9 **(1)** ARDMS;
10 **(2)** ARRT; or
11 **(3)** CCI.
12 **C.** magnetic resonance imaging:
13 **(1)** ARMRT; or
14 **(2)** ARRT.
15 **D.** nuclear medicine:
16 **(1)** ARRT; or
17 **(2)** NMTCB.
18 **E.** radiation therapy: ARRT.
19 **F.** radiography: ARRT.

20 [20.3.20.300 NMAC - N, 9/25/2018; A, xx/xx/2026]

21
22 **20.3.20.301 RECOGNIZED CREDENTIALS AND CERTIFICATIONS:** The board recognizes the
23 following medical imaging and radiation therapy credentials and certifications for each type of license issued by the
24 department:

- 25 **A.** fusion imaging- restricted to PET/CT medical imaging procedures only:
26 **(1)** (CNMT)(NMTCB) and (CT)(NMTCB);
27 **(2)** R.T. (ARRT)(N) and (ARRT)(CT);
28 **(3)** R.T. (ARRT)(N) and (NMTCB)(CT); or
29 **(4)** R.T. (ARRT)(R) and (NMTCB)(PET).
30 **B.** cardiac sonography:
31 **(1)** (CCI)(RCS);
32 **(2)** (CCI)(RCCS); or
33 **(3)** (ARDMS)(RDCS).
34 **C.** computed tomography:
35 **(1)** R.T. (ARRT)(CT); or
36 **(2)** NMTCB(CT).
37 **D.** general sonography:
38 **(1)** RDMS (ARDMS)(AB);
39 **(2)** RDMS (ARDMS)(BR);
40 **(3)** RDMS (ARDMS)(OB);
41 **(4)** R.T. (ARRT)(S); or
42 **(5)** R.T. (ARRT)(BS).
43 **E.** limited radiography: none.
44 **F.** magnetic resonance imaging:
45 **(1)** (ARMRT)(RMRIT); or
46 **(2)** R.T. (ARRT)(MR).
47 **G.** musculoskeletal sonography: (ARDMS)(RMSK).
48 **H.** nuclear medicine:
49 **(1)** certified nuclear medicine technologist (NMTCB); or
50 **(2)** nuclear medicine technology R.T. (ARRT)(N).
51 **I.** phlebology sonography: RPhS (CCI).
52 **J.** radiation therapy: R.T. (ARRT)(T).
53 **K.** radiography: R.T. (ARRT)(R).
54 **L.** radiology assistant: (ARRT)(RRA).
55 **M.** vascular sonography:
56 **(1)** R.T. (ARRT)(VS);

(2) RVS (CCI); or
(3) RVT(ARDMS).
[20.3.20.301 NMAC - N, 9/25/2018; A, xx/xx/2026]

20.3.20.302 - 20.3.20.309 [RESERVED]

20.3.20.310 LIMITED PRACTICE OF RADIOGRAPHY LICENSE:

A. Limited practice in radiography. An individual seeking a license for the limited practice of radiography shall submit an application and applicable fee to the department, successfully complete an approved limited radiography program pursuant to Subsection B of 20.3.20.200 NMAC, and take and pass the state examination pursuant to Subsections D and E below. Individuals that are enrolled in an approved limited practice radiography program shall perform their required clinical radiography procedures under the direct supervision of a licensed physician or licensed radiographer. A licensee with a limited practice of radiography license shall perform restricted diagnostic radiography under direct supervision of a licensed practitioner limited to the following specific procedures:

- (1) the viscera of the thorax;
- (2) extremities;
- (3) radiation to humans for diagnostic purposes in the practice of dentistry;
- (4) axial/appendicular skeleton; or
- (5) the foot, ankle, or lower leg.

B. Restrictions. A licensee with a limited practice of radiography license may not:

- (1) perform procedures outside the areas of specialization authorized by or under the individual's license; or
- (2) perform procedures outside their scope of practice including, but not limited to procedures involving the use of contrast media, fluoroscopic equipment, mammography, computed tomography, mobile or bedside radiography, diagnostic medical sonography, magnetic resonance imaging, nuclear medicine, or radiation therapy.

C. Emergency provision. A person having a valid limited practice of radiography license may perform diagnostic radiography procedures outside the normal scope of a limited practice of radiography license if the person is employed in an area having a federal designation as a medically underserved area and the person with the limited practice of radiography license is confronted with an emergency situation, where, by order of a licensed practitioner, a certified nurse practitioner or a registered physician assistant, the additional diagnostic radiography procedure is deemed medically necessary for the immediate safety or health of the patient.

D. Administration of state examinations. The department will not offer state examinations for medical imaging and radiation therapy professionals except for a limited practice of radiography licensee pursuant to Subsection E of this section. The department may administer and grade the limited practice of radiography examinations, though at its option, the department may contract for such preparation, administration, and grading services.

E. State examination for limited practice of radiography. An individual seeking a license for the limited practice of radiography must pass a state examination for limited practice of radiography. To apply for the state examination, the individual must:

- (1) submit an examination application with supporting documentation to the department that the individual has:
 - (a) completed school through the 12th grade or has passed a high school equivalency examination; and
 - (b) successfully completed an approved limited radiography program in one or more of the body areas of specialization.

- (2) submit the required examination fee to the department; and
- (3) successfully complete a written or computerized examination administered by the department with a minimum score of seventy-five percent on both the core section and in each attempted body area section of the examination. At its option, the department may contract for such preparation, administration, and grading services for the limited practice of radiography examinations.

F. Failure of state examination for limited practice of radiography:

- (1) If an applicant fails to achieve seventy-five percent on either the core section or a body area specialization section of the examination, it will be considered an examination failure and the applicant must retake the failed section or sections.

(2) The applicant must re-apply and pay the examination fee for each examination attempt.
(3) All sections of the examination taken on the same day are considered one examination attempt.

(4) An individual who attempts and fails the state-administered examination three times will be required to demonstrate to the department the successful completion of remedial education or training following the third attempt that is consistent with the ARRT standards before being eligible to retake the failed section or sections again.

[20.3.20.310 NMAC - N, 9/25/2018]

20.3.20.311 - 20.3.20.319 [RESERVED]

20.3.20.320 LICENSES:

A. Licensure Requirements. An applicant for a medical imaging or radiation therapy license shall submit the required application to the department; the applicable application fee located in 20.3.20.501 NMAC, and shall be currently certified and registered by a medical imaging or radiation therapy credentialing organization recognized by the board.

B. Registration number. The department shall assign a department registration number to each licensee regardless of the number of modalities and subspecialties licensed. The department registration number shall be listed on each certificate of licensure issued by the department.

C. Term for licenses issued prior to the 15th of the month. The license term for licenses issued prior to the 15th of the month will:

- (1) be for 24 months;
- (2) begin on the date the license is issued; and
- (3) end on the last day of the month the license was issued.

D. Term for licenses issued after the 15th of the month. The license term for licenses issued after the 15th of the month will:

- (1) be for 24 months;
- (2) begin on the date the license is issued; and
- (3) end on the last day of the month following the month the license was issued.

E. Request for coordination of license and credential expiration dates. At the written request of the licensee, the expiration date of their license or licenses may be reduced to match their current credentialing organization's expiration date. Such reduction in term shall not reduce the applicant or licensee's license fee.

F. Types of license. Upon demonstration of compliance with all applicable requirements of the act and this part, the department may grant one or more of the following types of licenses to be recognized by the department:

(1) (DMS) which includes sonography subspecialties of RDMS (ARDMS)(AB)(BR)(OB) and R.T. (ARRT)(S)(BS);

(2) (MSK);

(3) (FUS);

(4) (LXV);

(5) (LXE);

(6) (LXP);

(7) (LXT);

(8) (MRT);

(9) (NMT);

(10) (PBS);

(11) (PVL);

(12) (RTT);

(13) (RRT);

(14) (RRA);

(15) (TMP);

(16) (VS), which includes sonography subspecialties of (ARDMS)(RVT) and R.T. ARRT (VS);

(17) (CS) which includes RDCS (ARDMS), RCS (CCI), and RCCS (CCI); and

(18) (CT).

1 **G. Certificate of licensure.** Each certificate of licensure issued by the department shall identify all
2 current licenses granted to the licensee.
3 [20.3.20.320 NMAC - N, 9/25/2018; A, 04/19/2022]
4

5 **20.3.20.321 TEMPORARY LICENSES:**

6 **A. Temporary license.** The purpose of a temporary license is to allow an individual who has
7 completed an approved program pursuant to 20.3.20.200 NMAC to practice medical imaging or radiation therapy
8 prior to sitting for their national examination with one of the medical imaging and radiation therapy credentialing
9 organizations outlined in 20.3.20.300 NMAC. The department may grant a temporary license to practice medical
10 imaging or radiation therapy to an individual who:

11 (1) provides documentation to the department that the individual has completed an approved
12 program pursuant to 20.3.20.200 NMAC;

13 (2) submits an application for a temporary license to the department within one year of the
14 individual's program completion date from an approved program;

15 (3) submits the applicable fees for a temporary license pursuant to Paragraph G of
16 20.3.20.501 NMAC to the department within one year of the program completion date from an approved program;

17 (4) provides the name and contact information of each employer where medical imaging or
18 radiation therapy is performed by the individual; and

19 (5) meets all other applicable licensure requirements of the act and this part.

20 **B. Notification.** The individual will be required to notify the department of any changes to his or her
21 employment by providing the department with the contact information for each new employer where medical
22 imaging or radiation therapy is performed by the individual within thirty days after the change occurs.

23 **C. Examination and notice.**

24 (1) The department will recognize the credentialing organization's determination of what is
25 considered a pass or fail for an individual's examination score.

26 (2) The individual shall notify the department of the date the individual plans to take the
27 examination at least 30 days prior to the examination date.

28 (3) If the credentialing organization determines that an individual has failed his or her
29 examination, the individual's active temporary license issued by the department will expire 90 days after the
30 examination date. The individual will be required to notify the department of a failed examination within 30 days of
31 receiving his or her examination results.

32 **D. Temporary license term.** A temporary license:

33 (1) expires on the last day of the 12th month from the date of issuance or upon the
34 applicant's failure to pass the examination as outlined in Subsection B of this section; and

35 (2) may be granted only once and cannot be renewed or extended; however, a duplicate
36 temporary certificate of licensure may be issued by the department for display at another place of employment upon
37 submission of a duplicate certificate of licensure application and fee.

38 [20.3.20.321 NMAC - N, 9/25/2018]
39

40 **20.3.20.322 PROVISIONAL LICENSES:**

41 **A. Provisional license.** The department may grant a provisional license to practice medical imaging
42 to an individual who:

43 (1) submits an application to the department; and

44 (2) follows training pathways established by one of the following recognized national
45 certification organizations:

46 (a) ARRT;

47 (b) ARDMS;

48 (c) ARMRT;

49 (d) CCI; or

50 (e) NMTCB.

51 **B. License Term.** A provisional license:

52 (1) expires two years from the date of issuance;

53 (2) may be renewed one time; and

54 (3) the one-time renewal must occur before the license term expires in order to ensure the
55 individual's provisional license remains active for that provisional license's second and last license term.

1 **C. Term for licenses issued prior to the 15th of the month.** The license term for licenses issued
2 prior to the 15th of the month will:

- 3 (1) be for 24 months;
- 4 (2) begin on the date the license is issued; and
- 5 (3) end on the last day of the month the license was issued.

6 **D. Term for licenses issued after the 15th of the month.** The license term for licenses issued after
7 the 15th of the month will:

- 8 (1) be for 24 months;
- 9 (2) begin on the date the license is issued; and
- 10 (3) end on the last day of the month following the month the license was issued.

11 **E. Applicability to licensee enrolled in an approved program.** This section does not apply to a
12 licensee who is currently enrolled in an approved program leading to qualification for another modality and
13 subspecialty license.

14 **F.** A provisional license to practice medical imaging or radiation therapy utilizing ionizing radiation
15 will not be issued to individuals who are not already licensed by the department in one of the modalities that utilizes
16 ionizing radiation.

17 [20.3.20.322 NMAC - N, 9/25/2018; A, 04/19/2022]

18
19 **20.3.20.323 - 20.3.20.329 [RESERVED]**

20
21 **20.3.20.330 CONTINUING EDUCATION:**

22 **A. Continuing education.**

23 (1) During the license term, a limited practice of radiography licensee must complete 24
24 hours or credits of category A or A+ continuing education approved by a RCEEM recognized by the ARRT.
25 Documentation of completion of the required continuing education must be submitted to the department with each
26 renewal application.

27 (2) During the license term, a medical imaging, a radiation therapy, or a radiologist assistant
28 licensee, other than a limited practice of radiography licensee, must comply with all continuing education,
29 continuing competency, and registration requirements of the credentialing organization for which they hold a
30 credential or certification. The department may require a licensee to certify meeting the credentialing organization's
31 requirements. Failure to meet the credentialing organization's requirements may be grounds for suspension or
32 revocation of a license. This does not apply to individuals with an active temporary license or with an active
33 provisional license that has been issued by the department.

34 (3) The department may require a licensee to submit documentation from the credentialing
35 organization if online verification is not available at the time the licensee's renewal request is being reviewed.

36 **B. Audit.** The department may audit a licensee's continuing education and continuing compliance
37 with requirements of the act and this part. A licensee must submit the audit information requested by the department
38 within 30 days of receipt of the notification of audit. No application or fees are required when submitting
39 information requested by the department for an audit.

40 [20.3.20.330 NMAC - Rp, 20.3.20.500 NMAC, 9/25/2018; A, 04/19/2022]

41
42 **20.3.20.331 - 20.3.20.339 [RESERVED]**

43
44 **20.3.20.340 DUTIES OF LICENSEE:**

45 **A. Continuing to comply with requirements.** A licensee must:

46 (1) continue to comply with all licensure requirements of the act and this part throughout the
47 license term;

48 (2) maintain credential or certification and registration in their licensed imaging modality
49 and subspecialty, if applicable, throughout the licensure period or notify the department in writing within 30 days
50 that a credential or certification is no longer being maintained;

51 (3) notify the department in writing within 30 days of any pending or final actions by a
52 credentialing organization, state agency, or federal agency against the licensee; and

53 (4) notify the department in writing within 30 days of lapse, probation, suspension, or
54 revocation of any professional license.

55 **B. Expired, suspended, or revoked license.** An individual whose license has expired, or has been
56 suspended or revoked by the department, shall not perform medical imaging or radiation therapy procedures.

1 **C. Duty to cooperate with department.** An applicant or licensee has a duty to cooperate with the
2 department during an investigation or inspection authorized under the act, this part, or other state or federal law.

3 **D. Reporting violations.** A licensee has a duty to report a violation of the act, this part, or other state
4 or federal law to the department or other appropriate agency.

5 **E. Supervision of students or licensees.**

6 (1) A limited practice of radiography licensee shall only provide supervision of a limited
7 practice of radiography student or licensee.

8 (2) A medical imaging or radiation therapy licensee may provide supervision to a medical
9 imaging or radiation therapy student or licensee in the same modality and specialization as the licensee. A
10 radiographer may provide supervision to a limited practice of radiography student or licensee.

11 [20.3.20.340 NMAC - N, 9/25/2018]
12

13 **20.3.20.341 CERTIFICATE OF LICENSURE:**

14 **A. Display of certificate of licensure.** Original certificates of licensure shall be publicly displayed
15 by the licensee at each place of employment.

16 **B. Photocopying or reproduction prohibited.** Photocopying or other reproduction of a certificate
17 of licensure is prohibited.

18 **C. Duplicate certificate of licensure or replacement of certificate of licensure.** To obtain a
19 duplicate certificate of licensure or replacement of certificate of licensure, the licensee must submit a duplicate
20 certificate of licensure or replacement certificate of licensure application and required fee to the department.

21 **D. Legal Name Change.** To obtain a replacement certificate of licensure due to a legal name
22 change, the licensee must submit documentation of the legal name change, a name change application, and required
23 fee to the department.

24 [20.3.20.341 NMAC - N, 9/25/2018]
25

26 **20.3.20.342 - 20.3.20.399 [RESERVED]**
27

28 **20.3.20.400 RENEWAL, REINSTATEMENT, AND REAPPLICATION:**

29 **A. License renewal and reinstatement.** A licensee is solely responsible for ensuring they maintain
30 a current license. Failure to receive notification by the department prior to the expiration date of the license is not an
31 excuse for failure to file a timely renewal application.

32 (1) Prior to the expiration date listed on the licensee's current certificate of licensure, a
33 licensee must submit the biennial licensure fee and completed renewal application, including any requested
34 supporting documents to the department.

35 (2) The department will not process an incomplete renewal application.

36 (3) The department will process completed applications in the order received.

37 (4) The department shall not renew a license until it is satisfied the license renewal applicant
38 meets all requirements of the act and this part.

39 (5) All required items must be received by the department prior to the expiration date on the
40 licensee's current certificate of licensure or else the renewal application shall be considered incomplete. The
41 licensee's failure to submit a complete license renewal application will result in a reinstatement fee. An earlier
42 postmark date shall not excuse the reinstatement fee.

43 (a) If a reinstatement fee is assessed and all other requirements for renewal are met,
44 the department will issue an invoice to the licensee that will accompany the renewed certificate of licensure.

45 (b) If an applicant or licensee fails to pay the reinstatement fee within 30 days of the
46 invoice date, the department may take action to suspend the license until the department has received the
47 reinstatement fee.

48 **B. Reapplication.** Reapplication is required if a license has been expired for more than one year.
49 An applicant for reapplication must meet all of the requirements contained in 20.3.20.320 NMAC.

50 [20.3.20.400 NMAC - Rp, 20.3.20.501 NMAC, 9/25/2018]
51

52 **20.3.20.401 - 20.3.20.499 [RESERVED]**
53

54 **20.3.20.500 DEPARTMENT FORMS, CONFIDENTIALITY, AND RELEASE OF PERSONAL**
55 **IDENTIFICATION:**

56 **A. Department forms required.**

(1) An individual seeking licensure or any other services listed in this part shall submit a completed application form and applicable fee to the department.

(2) The department shall create and make available all necessary application forms.

(3) The department's forms may request such personal identification as is required to perform the department's duties under the act and this part including, but not limited to: name, mailing address, telephone numbers, email address, certifications, licenses, date of birth, and social security number.

(4) No application shall be complete unless it is on the form prescribed by the department and includes, in legible format:

(a) all required personal identification;

(b) copies of all supporting documents specified on the form;

(c) full payment of required fees by a method specified on the form; and

(d) date and signature of the applicant.

B. Confidentiality of personal identification. Personal identification collected by the department shall not be disclosed except:

(1) in the performance of the department's duties under the act or this part;

(2) as provided in this part or as required by state or federal law; or

(3) in response to a valid subpoena or court order.

C. Release of licensee personal identification. Unless otherwise provided by law, the department shall only release a licensee's name, mailing address, department registration number, and verification of license and subspecialty. The department may release information related to an application denial or license revocation or suspension to a credentialing organization. In accordance with federal law, the department shall release any required information related to revocation or suspension of a licensee to the national practitioner data bank. [20.3.20.500 NMAC - N, 9/25/2018]

20.3.20.501 FEES:

A. Application fee. In addition to any other fees, an application fee of \$10.00 must be submitted with each type of application available from the department, unless otherwise provided in this part.

B. Initial license fee. An initial license fee of \$100.00 must be submitted with each initial license application, regardless of the number of modality and subspecialty licenses requested on the same application.

C. Examination fee. An examination fee of \$150.00 must be submitted with each examination application as required in 20.3.20.310 NMAC.

D. Biennial licensure fee. A biennial fee of \$100.00 may be submitted to the department prior to the expiration date of the individual's current license issued by the department. The department will renew an individual's license upon submittal of the fee and the license will be valid for 24 months after the expiration date of their current license issued by the department.

E. License reinstatement fee. In addition to any other required fees, a license reinstatement fee of \$25.00 must be submitted with a license reinstatement application or if a licensee fails to submit a complete renewal application before the expiration of a license.

F. Duplicate certificate of licensure or replacement of certificate of licensure fee. A fee of \$5.00 will be required for each duplicate certificate of licensure or replacement of certificate of licensure requested in the application and a fee of \$5.00 for each additional duplicate certificate of license or replacement of certificate of licensure ordered from all other application forms that provide the option to request additional original duplicate certificates of licensure or replacement of certificate of licensure.

G. Temporary license fee. A temporary license fee of \$50.00 must be submitted with each temporary license application.

H. Provisional license fee. A provisional license fee of \$25.00 must be submitted with a provisional license application.

I. License verification fee. A license verification fee of \$10.00 for each verification must be submitted with each license verification form.

J. Legal name change fee. A legal name change fee of \$15.00 must be submitted with each legal name change application.

K. Refunds. Fees submitted to the department are non-refundable and non-transferrable. However, if the department determines that fees have been received in excess of the amount legally due, the department will refund the excess amount portion of the received fee upon receipt of a written request from the individual who paid the excess fee amount, or that individual's legal representative.

1 **L. Nonsufficient funds fee.** If the department is unable to process the fees submitted by the
2 applicant, then the name of that licensee will be removed from the list of all New Mexico active radiologic
3 technologists, which appears on the New Mexico environment department's radiation control bureau website, and
4 the department will assess a \$25.00 nonsufficient fund fee. That licensee must submit payment to the department in
5 the form of a cashiers' check or money order.

6 [20.3.20.501 NMAC - Rp, 20.3.20.600 NMAC, 9/25/2018]

7
8 **20.3.20.502 - 20.3.20.599 [RESERVED]**
9

10 **20.3.20.600 DENIAL, REVOCATION, OR SUSPENSION OF LICENSE:**

11 **A. Denial of application.** The department may not issue a license to an applicant who has failed to
12 meet the requirements of the act or this part.

13 **B. Suspension, revocation, application of uniform licensing act.** The board, with advice from the
14 advisory council, may deny, revoke, or suspend a license granted or applied for under the act and this part, pursuant
15 to the procedures established in the Uniform Licensing Act Section 61-1-1 through 61-1-34 NMSA 1978, upon
16 grounds that the medical imaging or radiation therapy licensee or applicant:

- 17 (1) is guilty of fraud or deceit in procuring or attempting to procure any type of license or
18 service from the department;
19 (2) has been convicted of a felony subsequent to licensure;
20 (3) is unfit or incompetent;
21 (4) is habitually intemperate or is addicted to the use of habit-forming drugs;
22 (5) is mentally incompetent;
23 (6) has aided and abetted an individual who is not a licensee in engaging in the activities of a
24 licensee;
25 (7) has failed to maintain a credential or certification in the modality and subspecialty for
26 which a license was granted;
27 (8) has engaged in any practice beyond the licensee's scope of practice in violation of state
28 or federal law or facility policy;
29 (9) is guilty of unprofessional conduct or unethical conduct as defined in Subsection C of this
30 section;
31 (10) has interpreted a diagnostic imaging exam for a patient, a patient's family, or the public;
32 (11) has willfully or repeatedly violated any provisions of the act or this part;
33 (12) has failed to notify the department in writing within 30 days of any final disciplinary
34 action by a licensing board or credentialing organization, including but not limited to sanction, probation,
35 suspension, or revocation; or
36 (13) is not in compliance with the terms of the New Mexico Parental Responsibility Act,
37 Section 40-5A-1 to 40-5A-13 NMSA 1978; in taking action under this provision, the board shall follow the
38 procedures in 20.1.7 NMAC named "Parental Responsibility Act Compliance."

39 **C. Unprofessional or unethical conduct.** With respect to the grounds for denial, revocation, or
40 suspension under Section 61-14E-11 NMSA 1978, the terms "unprofessional conduct" or "unethical conduct" shall
41 refer to, but shall not be limited to any licensee, applicant, medical imaging professional, or radiation therapist who:

- 42 (1) is engaged in the practice of medical imaging or radiation therapy while in an intoxicated
43 condition or under the influence of a narcotic or other drug that impairs consciousness, judgment, or behavior;
44 (2) is engaged in unethical conduct while practicing medical imaging or radiation therapy;
45 (3) has engaged in the willful falsification of records, or destruction or theft of property or
46 records relating to the practice of medical imaging or radiation therapy;
47 (4) fails to exercise due regard for the safety of life or health of the patient;
48 (5) has unauthorized access to or disclosure of information relating to a patient's records;
49 (6) discriminates against any individual because of race, religion, creed, color, national
50 origin, sex, or sex while practicing medical imaging or radiation therapy;
51 (7) has been convicted of a felony subsequent to licensure by the department;
52 (8) impersonates a current or former licensee or engages in the activities of medical imaging
53 or radiation therapy under an assumed name;
54 (9) is applying ionizing or non-ionizing radiation to a human being without a specific
55 prescription or direction of a licensed practitioner or other health care practitioner authorized to order a medical
56 imaging or radiation therapy;

(10) is incompetent or negligent in activities related to medical imaging, radiation therapy, or limited practice of radiography;
(11) is continuing to practice without obtaining a license or renewal as required by the act or this part;
(12) is using the prefix “Dr.”, unless entitled to do so pursuant to a degree granted, the word “doctor”, or any suffix or affix to indicate or imply that the individual is a licensed practitioner when not so licensed;
(13) is providing false, misleading, or deceptive information on any application or supporting documents submitted to the department;
(14) is failing to conform to nationally recognized practice standards as applicable to each modality or subspecialty;
(15) fails to disclose in writing to the department any felony conviction or non-compliance with the New Mexico Parental Responsibility Act, Section 40-5A-1 to 40-5A-13 NMSA 1978, within 30 days of the conviction or judgment; or
(16) fails to disclose in writing to the department any sanction, probation, suspension, or revocation by a state agency or credentialing organization within 30 days of such occurrence.

D. Opportunity for licensee or applicant to have a hearing. Any licensee or applicant whose license or license application is denied, revoked, or suspended under this part shall be afforded notice and an opportunity to be heard pursuant to the procedures established in the Uniform Licensing Act, Sections 61-1-1 to -34 NMSA 1978, the Medical Imaging and Radiation Therapy Health and Safety Act, Section 61-14E-11 NMSA 1978, and the adjudicatory procedures for the environmental improvement board in 20.1.2 NMAC.

E. Application of uniform licensing act. The department shall comply with the provisions of the Uniform Licensing Act, Section 61-1-1 to 61-1-34 NMSA 1978, and any rules or regulations promulgated thereunder.

[20.3.20.600 NMAC - Rp, 20.3.20.400 NMAC, 9/25/2018]

20.3.20.601 - 20.3.20.699 [RESERVED]

20.3.20.700 SEVERABILITY: If any provision or application of this part is held invalid, the remainder, or its application to other situations or persons, shall not be affected.

[20.3.20.700 NMAC - Rp, 20.3.20.700 NMAC, 9/25/2018]

20.3.20.701 AMENDMENT AND SUPERSESION OF PRIOR REGULATIONS: This part shall be construed as amending and superseding the regulations on the practice of medical imaging or radiation therapy, EIB/MRHSA 1, filed January 11, 1988, as amended. All references to the regulations on the practice of medical imaging or radiation therapy in any other rule shall be construed as a reference to this part.

[20.3.20.701 NMAC - Rp, 20.3.20.701 NMAC, 9/25/2018]

20.3.20.702 SAVING CLAUSE: Supersession of the regulations on the practice of medical imaging or radiation therapy shall not affect any administrative or judicial enforcement action pending on the effective date of this part nor the validity of any license granted or certificate of licensure issued pursuant to the regulations on the practice of medical imaging or radiation therapy.

[20.3.20.702 NMAC - Rp, 20.3.20.702 NMAC, 9/25/2018]

20.3.20.703 CONSTRUCTION: This part shall be liberally construed to effectuate the purpose of the act.

[20.3.20.703 NMAC - Rp, 20.3.20.703 NMAC, 9/25/2018]

20.3.20.704 COMPLIANCE WITH OTHER REGULATIONS: Compliance with this part does not relieve an individual from the obligation to comply with other applicable state and federal regulations.

[20.3.20.704 NMAC - Rp, 20.3.20.704 NMAC, 9/25/2018]

HISTORY OF 20.3.20 NMAC:

Pre-NMAC History: The material in this part was derived from that previously filed with the commission of public records - state records center and archives. EIB/MRHSA 1, Regulations on the Practice of Radiologic Technology, 11/11/1988.

History of repealed material: 20 NMAC 3.2, Radiologic Technology Certification, (filed 12/15/1995), repealed 8/31/2005.
20.3.20 NMAC, Radiologic Technology Certification, effective 8/31/2005, repealed 9/25/2018.

Other History:

EIB/MRHS 1, Regulations on the Practice of Radiologic Technology (filed 11/11/1988) was renumbered, reformatted and amended as 20 NMAC 3.2, Radiologic Technology Certification, effective 1/14/1996.
20 NMAC 3.2, Radiologic Technology Certification, (filed 12/15/1995) was replaced by 20.3.20, Radiologic Technology Certification, effective 8/31/2005.
20.3.20 NMAC Radiologic Technology Certification, effective 8/31/2005, was replaced by 20.3.20, Medical Imaging and Radiation Therapy Licensure, effective 9/25/2018