

Queensland



*Health Act 1937*

*Radiation Safety Act 1999*

# **RADIATION SAFETY REGULATION 1999**

**Reprinted as in force on 22 February 2002  
(includes amendments up to SL No. 20 of 2002)**

**Reprint No. 1C revised edition**

This reprint is prepared by  
the Office of the Queensland Parliamentary Counsel  
Warning—This reprint is not an authorised copy

# Information about this reprint

This regulation is reprinted as at 22 February 2002. The reprint shows the law as amended by all amendments that commenced on or before that day (Reprints Act 1992 s 5(c)).

The reprint includes a reference to the law by which each amendment was made—see list of legislation and list of annotations in endnotes.

This page is specific to this reprint. See previous reprints for information about earlier changes made under the Reprints Act 1992. A table of earlier reprints is included in the endnotes.

**Also see endnotes for information about—**

- **when provisions commenced**
- **editorial changes made in earlier reprints.**

Revised edition indicates further material has affected existing material. For example—

- a correction
- a retrospective provision
- other relevant information.

# Queensland



## RADIATION SAFETY REGULATION 1999

### TABLE OF PROVISIONS

Section		Page
<b>PART 1—PRELIMINARY</b>		
1	Short title . . . . .	7
2	Commencement . . . . .	7
3	Dictionary . . . . .	7
<b>PART 2—RADIATION SOURCES AND SEALED SOURCE APPARATUS</b>		
<i>Division 1—Radioactive substances</i>		
4	Concentration or activity of a radionuclide—Act, sch 2, definition “radioactive substance” . . . . .	7
5	Concentration of a radionuclide in a mineral substance—Act, sch 2, definition “radioactive substance” . . . . .	8
<i>Division 2—Radiation apparatus</i>		
6	Apparatus emitting ionising radiation—Act, sch 2, definition “radiation apparatus” . . . . .	8
7	Apparatus emitting non-ionising radiation—Act, sch 2, definition “radiation apparatus” . . . . .	9
<i>Division 3—Certificates of compliance</i>		
8	Periods within which certificates of compliance must be obtained—Act, s 18 . . . . .	9
<b>PART 3—ACT INSTRUMENTS</b>		
8A	Notification of change of circumstances—Act, s 92(2) . . . . .	10
9	Certain use or transport licences—Act, s 75(3) and (4) . . . . .	11
<b>PART 4—DISPOSAL</b>		
<i>Division 1—Disposal of radioactive material</i>		
10	Disposal of radioactive material into the air or water, other than into the sewerage system—Act s 26(1)(a) . . . . .	12
11	Disposal of radioactive material into the sewerage system—Act s 26(1)(a) . . . . .	13

*Radiation Safety Regulation 1999*

---

12	Disposal of radioactive material, other than into the air, water or sewerage system—Act s 26(1)(a) . . . . .	14
	<i>Division 2—Requirements for disposal of certain apparatus or containers</i>	
13	Removal etc. of radiation warning signs . . . . .	14
	<b>PART 5—RADIATION SAFETY AND PROTECTION PLANS</b>	
	<i>Division 1—Radiation safety and protection measures for all radiation practices</i>	
14	Methods and procedures—Act, s 28(6) . . . . .	15
15	Control of access to, or use of, radiation sources—Act, s 28(6) . . . . .	16
16	Supply of safety devices—Act, s 28(6) . . . . .	16
17	Supply of personal protective equipment—Act, s 28(6) . . . . .	17
18	Keeping records—Act, s 28(6) . . . . .	17
19	Supply of personal monitoring devices—Act, s 28(6) . . . . .	18
	<i>Division 2—Radiation safety and protection measures for certain radiation practices</i>	
20	Radiation practices involving the use of ionising radiation sources—Act, s 28(6) . . . . .	18
21	Radiation practices involving the use or storage of unsealed radioactive substances—Act, s 28(6) . . . . .	20
22	Certain radiation practices involving the use of ionising radiation sources—Act, s 28(6) . . . . .	21
23	Radiation practices involving the carrying out of a diagnostic, therapeutic or cosmetic procedure involving the irradiation of a person—Act, s 28(6) . . . . .	22
24	Radiation practices involving the carrying out of a diagnostic or therapeutic procedure involving the irradiation of a person—Act, s 28(6) . . . . .	24
25	Radiation practices resulting in the production of the radionuclide radon-222—Act, s 28(6) . . . . .	24
	<i>Division 3—Other particulars to be stated in radiation safety and protection plans</i>	
26	Radiation safety officers—Act, s 28(2)(g) . . . . .	24
	<b>PART 6—RADIATION SAFETY OFFICERS</b>	
27	Qualifications—Act, s 36(3) . . . . .	25
28	Functions—Act, s 37(2)(b)(iii) and 224(5)(b)(iii) . . . . .	25
	<b>PART 7—RADIATION MONITORING</b>	
29	Information in personal monitoring records—Act, s 38(4)(b) . . . . .	26

**PART 8—RADIATION DOSE LIMITS*****Division 1—Ionising radiation***

30	Radiation dose limits applying for occupational exposure of persons—Act, ss 37(2)(c)(i), 41(5), 42(2), 127(1)(b), 132(4)(b), 133(2)(c) and 224(5)(c)(i) . . . . .	27
31	Radiation dose limits applying for public exposure of persons—Act, ss 37(2)(c)(i), 42(2), 127(1)(b), 132(4)(b), 133(2)(c) and 224(5)(c)(i) . . . . .	28
32	Radiation dose limits applying for the carrying out of a diagnostic or therapeutic procedure involving the irradiation of a person—Act, ss 37(2)(c)(i), 41(5), 127(1)(b), 132(4)(b), 133(2)(c) and 224(5)(c)(i) . . . . .	28
33	Radiation dose limits applying for persons voluntarily participating in health-related research—Act, ss 42(2), 127(1)(b), 132(4)(b) and 133(2)(c) . . . . .	29
34	Supply of personal monitoring devices—Act, s 28(3) . . . . .	29
35	Pregnant women—Act, ss 37(2)(c)(i), 41(5), 42(2), 127(1)(b), 132(4)(b), 133(2)(c) and 224(5)(c)(i) . . . . .	30
35A	Mineral substances that are not radioactive substances . . . . .	30

***Division 2—Non-ionising radiation***

36	Functions of radiation safety officers—Act, s 37(2)(c)(ii) and 224(5)(c)(ii)	31
37	Carrying out diagnostic or therapeutic procedures involving the irradiation of a person—Act, s 41(5). . . . .	31
38	Carrying out cosmetic procedures involving the irradiation of a person—Act, s 42(2) . . . . .	31
39	Seizing dangerous things—Act, ss 127(1)(b), 132(4)(b) and 133(2)(c) . . . .	31

**PART 8A—AUTHORISED PERSONS**

39A	Authorised persons for diagnostic or therapeutic procedures—Act, s 41 . . .	32
-----	---	----

**PART 9—EXEMPTIONS*****Division 1—Requirement for use licence***

40	Prescribed radiation practices—Act, s 13(3). . . . .	32
41	Training—Act, s 13(2)(b)(ii). . . . .	33

***Division 2—Radiation sources***

42	Exemption from requirement for possession licence—Act, s 210 . . . . .	34
43	Exemption from requirement for use licence—Act, s 210 . . . . .	34
44	Exemption from requirement for transport licence—Act, s 210. . . . .	35
45	Smoke detectors—Act, s 210 . . . . .	35

*Radiation Safety Regulation 1999*


---

46	Certain radioactive substances, incorporated in items to produce light—Act, s 210 .....	36
47	Gaseous tritium light devices—Act, s 210 .....	37
48	Depleted uranium—Act, s 210 .....	37
49	Sealed radioactive substances used in teaching—Act, s 210 .....	37
50	Minerals—Act, s 210 .....	38
51	Abrasive blasting material containing radionuclides—Act, s 210 .....	38
52	Mineral substances—Act, s 210 .....	39
53	Persons who have been injected with a radioactive substance etc. as part of a diagnostic or therapeutic procedure—Act, s 210 .....	40
<b>PART 9A—REGISTERS</b>		
53A	Register of licensees—Act, s 207 .....	41
53B	Register of accredited persons—Act, s 207 .....	42
53C	Register of qualified persons—Act, s 207 .....	42
53D	Register of inspectors—Act, s 207 .....	42
53E	Register of State radiation analysts—Act, s 207 .....	43
<b>PART 9B—DISCLOSURE OF PROTECTED INFORMATION</b>		
53F	Disclosure of protected information .....	43
<b>PART 10—FEES</b>		
54	Fees—general .....	44
55	Fees—Act, s 51(1)(c)(i) .....	44
56	Fees—Act, s 79(2)(b)(i) .....	45
57	Waiver of fees—general .....	46
57A	Waiver of fees—undergraduates' professional development year .....	47
58	Refund of fees .....	48
<b>SCHEDULE 1</b> .....		
<b>RADIONUCLIDE CONCENTRATIONS AND ACTIVITIES</b>		
<b>SCHEDULE 2</b> .....		
<b>DISPOSAL OF RADIOACTIVE MATERIAL—RADIONUCLIDE CONCENTRATIONS</b>		
<b>SCHEDULE 3</b> .....		
<b>QUALIFICATIONS</b>		

	<b>SCHEDULE 3A</b> .....	72
	<b>AUTHORISED PERSONS</b>	
	<b>SCHEDULE 4</b> .....	82
	<b>TRAINING</b>	
	<b>SCHEDULE 5</b> .....	83
	<b>FEEES</b>	
	<b>SCHEDULE 6</b> .....	87
	<b>DICTIONARY</b>	
	<b>ENDNOTES</b>	
1	Index to endnotes .....	93
2	Date to which amendments incorporated. ....	93
3	Key .....	93
4	Table of earlier reprints .....	94
5	List of legislation .....	94
6	List of annotations .....	94





# **RADIATION SAFETY REGULATION 1999**

[as amended by all amendments that commenced on or before 22 February 2002]

## **PART 1—PRELIMINARY**

### **1 Short title**

This regulation may be cited as the *Radiation Safety Regulation 1999*.

### **2 Commencement**

This regulation commences on 1 January 2000.

### **3 Dictionary**

The dictionary in schedule 6 defines particular words used in this regulation.

## **PART 2—RADIATION SOURCES AND SEALED SOURCE APPARATUS**

### *Division 1—Radioactive substances*

### **4 Concentration or activity of a radionuclide—Act, sch 2, definition “radioactive substance”**

For paragraph (a) of the definition of “radioactive substance” in schedule 2 of the Act, radioactive material containing a radionuclide stated in schedule 1, column 1 is a radioactive substance if—

- (a) the concentration of the radionuclide is equal to, or more than, the concentration stated in schedule 1, column 2 shown opposite the radionuclide; and

- (b) the activity of the radionuclide is equal to, or more than, the activity stated in schedule 1, column 3 shown opposite the radionuclide.

## **5 Concentration of a radionuclide in a mineral substance—Act, sch 2, definition “radioactive substance”**

(1) This section applies to the following substances (the “**mineral substances**”)—

- (a) a mineral situated outside the boundaries of land the subject of a mining lease, mineral development licence or exploration permit within the meaning of the *Mineral Resources Act 1989*;
- (b) a substance into which a mineral has been changed as a result of the processing of the mineral.

*Examples of the ‘processing’ of a mineral—*

The refining, smelting or calcining of a mineral.

(2) Despite section 4, for paragraph (a) of the definition of “radioactive substance” in schedule 2 of the Act, a mineral substance containing a radionuclide stated in schedule 1, column 1 is a radioactive substance if the concentration of the radionuclide is equal to, or more than, the amount worked out by multiplying the concentration stated in schedule 1, column 2 shown opposite the radionuclide by 10.

## ***Division 2—Radiation apparatus***

## **6 Apparatus emitting ionising radiation—Act, sch 2, definition “radiation apparatus”**

(1) The amount for paragraphs (a) and (b) of the definition of “radiation apparatus” in schedule 2 of the Act is 1 microgray an hour, measured at a distance of 10 cm from any accessible surface of the apparatus.

(2) In this section—

“**accessible surface**”, of an apparatus, means a surface of the apparatus that may easily be touched.

**7 Apparatus emitting non-ionising radiation—Act, sch 2, definition “radiation apparatus”**

For paragraphs (c) and (d) of the definition of “radiation apparatus” in schedule 2 of the Act—

- (a) a laser that could reasonably be used to carry out a diagnostic, therapeutic or cosmetic procedure involving the irradiation of a person is an apparatus; and
- (b) the amount for the laser is the accessible emission limit, for a class 3B laser for the relevant period, stated in, and measured in accordance with, the laser standard.

***Division 3—Certificates of compliance*****8 Periods within which certificates of compliance must be obtained—Act, s 18**

(1) For section 18(2)<sup>1</sup> of the Act, the period is—

- (a) for an ionising radiation source, or a sealed radioactive substance incorporated in a sealed source apparatus, used to carry out a diagnostic or therapeutic procedure involving the irradiation of a person, other than an ionising radiation apparatus used to carry out intra-oral dental, or plain-film, diagnostic radiography—1 year; or
- (b) for an ionising radiation apparatus used to carry out intra-oral dental, or plain-film, diagnostic radiography involving the irradiation of a person—3 years; or
- (c) for an ionising radiation source, or a sealed radioactive substance incorporated in a sealed source apparatus, used to carry out a radiation practice for a research project—1 year; or
- (d) for an ionising radiation source, or a sealed radioactive substance incorporated in a sealed source apparatus, used in the course of a person’s study or training at an educational institution—1 year; or

---

<sup>1</sup> Section 18 (When a possession licensee must obtain a certificate of compliance) of the Act

- (e) for an ionising radiation source, or a sealed radioactive substance incorporated in a sealed source apparatus, used to carry out a radiation practice, other than a radiation practice stated in paragraph (a), (b), (c) or (d)—3 years; or
  - (f) for a laser apparatus used to carry out a diagnostic, therapeutic or cosmetic procedure involving the irradiation of a person—1 year.
- (2) For section 18(4) and (5) of the Act, the period is 5 years.

### **PART 3—ACT INSTRUMENTS**

#### **8A Notification of change of circumstances—Act, s 92(2)**

For section 92(2)<sup>2</sup> of the Act, the changes in the holder's circumstances are the following—

- (a) for a holder of a licence, a change in any of the following—
  - (i) the licence holder's name;
  - (ii) if the licence is a use licence and the licence holder is a health practitioner or a veterinary surgeon—
    - (A) the licence holder's accreditation, enrolment or registration as a health practitioner or a veterinary surgeon; or
    - (B) a condition attaching to the accreditation, enrolment or registration;
- (b) for a holder of an accreditation certificate, a change in either of the following—
  - (i) the certificate holder's name;
  - (ii) the certificate holder's contact details;

*Examples of contact details—*

Address, telephone number, facsimile number, email address.

- (c) for the holder of a continuing approval to acquire, a change in the approval holder's name;

---

2 Section 92 (Notification of change in circumstances) of the Act

- (d) for the holder of a radiation safety officer certificate, a change in the certificate holder's name.

## **9 Certain use or transport licences—Act, s 75(3) and (4)**

### **(1) For section 75(3)<sup>3</sup> of the Act—**

- (a) a use licence to use an ionising radiation source to carry out a diagnostic procedure, other than intra-oral dental diagnostic radiography, involving the irradiation of a person is subject to the condition that the holder of the licence comply with the document entitled 'Recommendations for Minimising Radiological Hazards to Patients (1985)' prepared by NHMRC;<sup>4</sup> and
- (b) a use licence to use an ionising radiation source for intra-oral dental diagnostic radiography, involving the irradiation of a person, is subject to the condition that the holder of the licence comply with the document entitled 'Code of Practice for Radiation Protection in Dentistry (1987)' prepared by NHMRC; and
- (c) a use licence to use an ionising radiation source for conducting health-related research on persons is subject to the condition that the holder of the licence comply with the document entitled 'Administration of Ionizing Radiation to Human Subjects in Medical Research (1984)' prepared by NHMRC.

(2) For section 75(4) of the Act, a document is the transport code of practice.

---

3 Section 75 (Standard conditions for certain Act instruments) of the Act

4 Copies of the document and the documents referred to in paragraphs (b) and (c), section 47(b) and schedule 6, definitions "equivalent dose" and "weighted equivalent dose" may be purchased from the Australian Radiation Protection and Nuclear Safety Agency, Lower Plenty Road, Yillambie, Victoria 3085.

## PART 4—DISPOSAL

### *Division 1—Disposal of radioactive material*

#### **10 Disposal of radioactive material into the air or water, other than into the sewerage system—Act s 26(1)(a)**

(1) For section 26(1)(a)<sup>5</sup> of the Act—

- (a) for radioactive material, containing only 1 of the radionuclides stated in schedule 2, column 1, being disposed of into the air—the maximum concentration is the concentration stated in schedule 2, column 2 shown opposite the radionuclide; or
- (b) for radioactive material, containing only 1 of the radionuclides stated in schedule 2, column 1, being disposed of into water—the maximum concentration is the concentration stated in schedule 2, column 3 shown opposite the radionuclide; or
- (c) for radioactive material, containing more than 1 of the radionuclides stated in schedule 2, column 1, being disposed of into the air or water—the material’s disposal factor must be not more than 1.

(2) Subsection (1) does not apply to the disposal of radioactive material into the sewerage system.

(3) In this section—

“**disposal factor**”, for radioactive material containing more than 1 of the radionuclides stated in schedule 2, column 1, means the total of the amounts worked out by applying the following formula to each of the radionuclides—

$$\frac{C}{MC}$$

where—

“**C**”, for a radionuclide, means the radionuclide’s concentration, measured in Bq a cubic metre.

“**MC**”, for a radionuclide, means—

<sup>5</sup> Section 26 (Disposal of radioactive material) of the Act

- (a) if the material is to be disposed of into the air—the concentration stated in schedule 2, column 2 shown opposite the radionuclide; or
- (b) if the material is to be disposed of into water—the concentration stated in schedule 2, column 3 shown opposite the radionuclide.

## **11 Disposal of radioactive material into the sewerage system—Act s 26(1)(a)**

(1) For section 26(1)(a) of the Act—

- (a) for radioactive material, containing only 1 of the radionuclides stated in schedule 2, column 1, being disposed of into the sewerage system—the maximum concentration is the concentration stated in schedule 2, column 4 shown opposite the radionuclide; or
- (b) for radioactive material, containing more than 1 of the radionuclides stated in schedule 2, column 1, being disposed of into the sewerage system—the material’s disposal factor must be not more than 1.

(2) For subsection (1), the point of disposal at which the concentration of a radionuclide in radioactive material is to be decided is a point at, or before, which the sewerage pipe leading from premises, at which the material is being disposed of, joins the main reticulation line of the sewerage system.

(3) In this section—

“**disposal factor**”, for radioactive material containing more than 1 of the radionuclides stated in schedule 2, column 1, means the total of the amounts worked out by applying the following formula to each of the radionuclides—

$$\frac{C}{MC}$$

where—

“**C**”, for a radionuclide, means the radionuclide’s concentration, measured in Bq a cubic metre.

“**MC**”, for a radionuclide, means the concentration stated in schedule 2, column 4 shown opposite the radionuclide.

**12 Disposal of radioactive material, other than into the air, water or sewerage system—Act s 26(1)(a)**

(1) For section 26(1)(a) of the Act—

- (a) for radioactive material, containing only 1 of the radionuclides stated in schedule 1, column 1, being disposed of other than into the air, water or sewerage system—the maximum concentration is one-half of the concentration stated in schedule 1, column 2 shown opposite the radionuclide; or
- (b) for radioactive material, containing more than 1 of the radionuclides stated in schedule 1, column 1, being disposed of other than into the air, water or sewerage system—the material's disposal factor must be not more than 1.

(2) In this section—

**“disposal factor”**, for radioactive material containing more than 1 of the radionuclides stated in schedule 1, means the total of the amounts worked out by applying the following formula to each of the radionuclides—

$$\frac{C}{MC}$$

where—

**“C”**, for a radionuclide, means the radionuclide's concentration, measured in Bq a gram.

**“MC”**, for a radionuclide, means one-half of the concentration stated in schedule 1, column 2 shown opposite the radionuclide.

*Division 2—Requirements for disposal of certain apparatus or containers*

**13 Removal etc. of radiation warning signs**

(1) This section applies to a person disposing of—

- (a) a container that has been used for the transport or storage of radioactive material; or
- (b) an apparatus that once contained a sealed radioactive substance; or



(c) a radiation apparatus.

(2) The person must, immediately before the disposal, remove or make illegible all radiation warning signs attached to the container or apparatus.

Maximum penalty—20 penalty units.

(3) In this section—

“**radiation warning signs**”, attached to a container or apparatus, means labels adhering to, or symbols embedded in, the container or apparatus indicating that the container or apparatus poses a radiation hazard.

## **PART 5—RADIATION SAFETY AND PROTECTION PLANS**

### *Division 1—Radiation safety and protection measures for all radiation practices*

#### **14 Methods and procedures—Act, s 28(6)**

(1) For section 28(6)<sup>6</sup> of the Act, the following are radiation safety and protection measures for preventing or minimising health risks to any person arising from exposure to radiation from the use of a radiation source in the carrying out of a radiation practice—

- (a) safe handling procedures to be followed for the source;
- (b) procedures and methods for ensuring the safe use of the source in the carrying out of the practice;
- (c) if the practice involves the production of images—procedures and methods for ensuring the correct use of ancillary imaging equipment used in connection with the use of the source to carry out the practice;
- (d) quality control procedures to be undertaken for—
  - (i) the source; and

---

<sup>6</sup> Section 28 (What is a “radiation safety and protection plan”) of the Act

- (ii) if the source is a sealed radioactive substance incorporated in a sealed source apparatus—the apparatus; and
- (iii) if the practice involves the production of images—any ancillary imaging equipment used in connection with the use of the source to carry out the practice;
- (e) remediation procedures to be followed for any accidents that could reasonably be expected to happen in relation to the carrying out of the practice.

(2) In this section—

**“remediation procedures”**, for an accident, means procedures designed to minimise any radiation hazard arising from the accident.

## **15 Control of access to, or use of, radiation sources—Act, s 28(6)**

For section 28(6) of the Act, a radiation safety and protection measure for preventing or minimising health risks to any person arising from exposure to radiation from the use of a radiation source in the carrying out of a radiation practice is a statement about how access to, or use of, the source is to be controlled.

## **16 Supply of safety devices—Act, s 28(6)**

For section 28(6) of the Act, the following are radiation safety and protection measures for preventing or minimising health risks to any person arising from exposure to radiation from the use of a radiation source in the carrying out of a radiation practice—

- (a) a requirement that the possession licensee in possession of the source, under the licence, for the practice supply safety devices for use by persons while involved in carrying out the practice;
- (b) details of the devices to be supplied;
- (c) details of how, and when, the devices are to be used;
- (d) details of the intervals at which the devices are to be checked for wear and tear, and correct operation;
- (e) details of the persons who will be engaged to check the devices, described by reference to the abilities of the persons to perform the task.

**17 Supply of personal protective equipment—Act, s 28(6)**

For section 28(6) of the Act, the following are radiation safety and protection measures for preventing or minimising health risks to any person arising from exposure to radiation from the use of a radiation source in the carrying out of a radiation practice—

- (a) a requirement that the possession licensee in possession of the source, under the licence, for the practice supply personal protective equipment for wearing by persons while involved in carrying out the practice;
- (b) details of the type of the equipment to be supplied to the persons, described by reference to the nature of their involvement in the carrying out of the practice;
- (c) details of how, and when, the equipment is to be worn by the persons;
- (d) details of the intervals at which the equipment is to be checked for wear and tear, and correct operation;
- (e) details of the persons who will be engaged to check the equipment, described by reference to the abilities of the persons to perform the task.

**18 Keeping records—Act, s 28(6)**

For section 28(6) of the Act, a radiation safety and protection measure for preventing or minimising health risks to any person arising from exposure to radiation from the use of a radiation source in the carrying out of a radiation practice is a requirement that the use licensee allowed to use the source, under the licence, for the practice record in a register, supplied and under the control of the possession licensee who possesses the source, the following—

- (a) the names of persons who use the source to carry out the practice;
- (b) if the source is an unsealed radioactive substance—details of any disposal of radioactive material that happens in the carrying out of the practice;
- (c) details of—
  - (i) any quality control procedures undertaken for—
    - (A) the source; and

- (B) if the source is a sealed radioactive substance incorporated in a sealed source apparatus—the apparatus; and
  - (C) if the practice involves the production of images—any ancillary imaging equipment used in connection with the use of the source to carry out the practice; and
- (ii) the outcomes of the procedures.

### **19 Supply of personal monitoring devices—Act, s 28(6)**

(1) This section applies if, under a radiation safety and protection plan for a radiation practice, a person is required to be supplied a personal monitoring device.<sup>7</sup>

(2) For section 28(6) of the Act, the following are measures relevant to the carrying out of the practice—

- (a) details of the persons who are required to wear the device, described by reference to the nature of their involvement in the carrying out of the practice;
- (b) details of how, when and where the device is to be worn;
- (c) details of where the device is to be stored when not being worn;
- (d) details of the intervals at which the device is to be assessed;
- (e) details of the persons who are to perform the assessment, described by reference to the abilities of the persons to perform the task.

### ***Division 2—Radiation safety and protection measures for certain radiation practices***

### **20 Radiation practices involving the use of ionising radiation sources—Act, s 28(6)**

(1) This section applies if a radiation practice involves the use of an ionising radiation source.

---

<sup>7</sup> Section 28(3) of the Act states the circumstances in which a radiation safety and protection plan for a radiation practice must provide for the supply of a personal monitoring device to a person.

(2) For section 28(6) of the Act, the following are measures relevant to the carrying out of the practice<sup>8</sup>—

- (a) a requirement that the possession licensee in possession of the source, under the licence, for the practice supply personal alarm dosimeters for use by persons while involved in carrying out the practice;
- (b) details of the persons who are required to use the dosimeters, described by reference to the nature of their involvement in the carrying out of the practice;
- (c) details of how, and when, the dosimeters are to be used by the persons;
- (d) details of the dosimeters, having the sensitivity, accuracy, range and energy response appropriate to the source, that will be used;
- (e) details of the intervals, of not more than 12 months, at which the dosimeters are to be checked for sensitivity, accuracy, range and energy response;
- (f) if a personal alarm dosimeter is repaired or suspected to have been damaged—a requirement that the dosimeter not be used unless it is first checked for sensitivity, accuracy, range and energy response;
- (g) details of the persons who will be engaged to check the sensitivity, accuracy, range and energy response of the dosimeters, described by reference to the abilities of the persons to perform the task.

(3) In this section—

**“personal alarm dosimeter”** means a device that produces a visual or audible signal when—

- (a) any radiation dose received by the device is more than a certain dose level; or
- (b) any radiation dose received by the device during a particular period is more than a certain dose level.

---

8 The radiation safety and protection measures, for preventing or minimising health risks to persons arising from exposure to radiation from the carrying out of certain radiation practices, stated in this division are in addition to the measures stated in division 1.

## **21 Radiation practices involving the use or storage of unsealed radioactive substances—Act, s 28(6)**

(1) This section applies to a radiation practice involving the use or storage of unsealed radioactive substances at premises.

(2) For section 28(6) of the Act, the following are measures relevant to the carrying out of the practice—

- (a) details stating how the premises, and persons or things at the premises, are to be monitored to detect, or minimise, contamination of the premises, persons or things;
- (b) details about how, and the period for which, contaminated cleanable things at the premises are to be stored at the premises before removal from the premises for cleaning;
- (c) details about how waste radioactive material, produced in carrying out the practice, is to be dealt with before its disposal;
- (d) details about how the amount of waste radioactive material produced in carrying out the practice is to be minimised.

(3) For subsection (2)(a), the measures must include details of the monitoring equipment, having the sensitivity, accuracy, range and energy response appropriate to the contamination to be monitored, that will be used.

(4) For subsection (2)(c), the measures must include the following—

- (a) the method to be used to minimise the activity of the radionuclide in, and volume of, the material;
- (b) if the material is to be stored—how the material is to be sorted for storage, having regard to—
  - (i) its half-life, volume, and physical and chemical properties; and
  - (ii) the concentration of the radionuclide in the material.

(5) In this section—

“**cleanable thing**”, at premises, means a thing that, to be cleaned, needs to be removed from the premises.

**22 Certain radiation practices involving the use of ionising radiation sources—Act, s 28(6)**

(1) This section applies to a radiation practice involving the use of an ionising radiation source to carry out a radiation practice, other than—

- (a) the use of an ionising radiation apparatus for—
  - (i) a diagnostic procedure involving the irradiation of a person; or
  - (ii) chemical analysis; or
- (b) the use of a sealed source apparatus for chemical analysis; or
- (c) the use of a cabinet radiation apparatus or enclosed radiation apparatus for its intended use.

(2) For section 28(6) of the Act, the following are measures relevant to the carrying out of the practice—

- (a) a requirement that the possession licensee in possession of the source, under the licence, for the practice supply radiation monitoring equipment for use by persons while involved in carrying out the practice;
- (b) details of how the equipment is to be used;
- (c) details of the equipment, having the sensitivity, accuracy, range and energy response appropriate to the radiation source, that will be used;
- (d) details of how the licensee will ensure the sensitivity, accuracy, range and energy response of the equipment, to be used, are maintained;
- (e) details of the intervals, of not more than 12 months, at which the equipment is to be checked for sensitivity, accuracy, range and energy response;
- (f) if the equipment is repaired or suspected to have been damaged—a requirement that the equipment must not be used unless it is first checked for sensitivity, accuracy, range and energy response;
- (g) details of the persons who will be engaged to check the sensitivity, accuracy, range and energy response of the equipment, described by reference to the abilities of the persons to perform the task.

(3) In this section—

**“radiation monitoring equipment”** means equipment that measures the amount of radiation emitted from radioactive substances or ionising radiation apparatus during a particular period.

**23 Radiation practices involving the carrying out of a diagnostic, therapeutic or cosmetic procedure involving the irradiation of a person—Act, s 28(6)**

(1) This section applies to a radiation practice involving the use of a radiation source to carry out a diagnostic, therapeutic or cosmetic procedure involving the irradiation of a person (the **“treated person”**).

(2) For section 28(6) of the Act, the following are measures relevant to the carrying out of the practice—

- (a) a requirement that the possession licensee in possession of the source, under the licence, for the practice supply personal protective equipment for wearing by the treated person while undergoing the procedure;
- (b) a requirement that the use licensee who, under the licence, uses the source to carry out the procedure ensures that the treated person wears the equipment while undergoing the procedure;
- (c) details of the equipment to be supplied;
- (d) a requirement that the use licensee record in a register, supplied and under the control of the possession licensee, the following details about each exposure of the treated person to radiation while undergoing the procedure—
  - (i) the date of use of the source to carry out the procedure;
  - (ii) details of the procedure;
  - (iii) if the treated person was injected with a radioactive substance, or a radioactive substance was administered to or implanted in the person, as part of the procedure—details of the substance;
- (e) if the carrying out of the procedure results in the production of radiographs or nuclear medicine images—
  - (i) a requirement that the images produced be permanently marked with relevant information; and



(ii) details of the way in which the marking is to be made.

(3) In this section—

**“permanent marking”**, of an image, means to mark it in a way that leaves a permanent record on the image.

**“relevant information”**, for a nuclear medicine image, means the following information—

- (a) the name, or identifying mark, of the use licensee;
- (b) the name, or identifying mark, of the possession licensee;
- (c) the address, or identifying mark, of the premises at which the image was produced;
- (d) the name, gender and date of birth of the treated person;
- (e) the date the image was produced;
- (f) details of the radiopharmaceuticals administered to, or injected into, the treated person for the production of the image;
- (g) adequate information to enable the correct interpretation of the image.

**“relevant information”**, for a radiograph with a surface area of 45 cm<sup>2</sup> or more, means the following information—

- (a) the name, or identifying mark, of the use licensee;
- (b) the name, or identifying mark, of the possession licensee;
- (c) the address, or identifying mark, of the premises at which the radiograph was produced;
- (d) the name, gender and date of birth of the treated person;
- (e) the date the radiograph was produced;
- (f) adequate information to enable the correct interpretation of the radiograph.

**“relevant information”**, for a radiograph with a surface area of less than 45 cm<sup>2</sup>, means a marking that identifies, or helps in the identification of, the treated person.

**24 Radiation practices involving the carrying out of a diagnostic or therapeutic procedure involving the irradiation of a person—Act, s 28(6)**

(1) This section applies to a radiation practice involving the use of a radioactive substance to carry out a diagnostic or therapeutic procedure involving the irradiation of a person.

(2) For section 28(6) of the Act, a measure relevant to the carrying out of the practice is a measure that provides guidance about the duration of the procedure.

**25 Radiation practices resulting in the production of the radionuclide radon-222—Act, s 28(6)**

(1) This section applies to a radiation practice that results in the production of the radionuclide radon-222.

(2) For section 28(6) of the Act, a measure relevant to the carrying out of the practice is a requirement that the premises in which the practice is carried out are ventilated in a way that prevents the concentration of the radionuclide being more than 200 Bq a cubic metre.

*Division 3—Other particulars to be stated in radiation safety and protection plans*

**26 Radiation safety officers—Act, s 28(2)(g)**

(1) This section applies if a possession licensee, under the licence, possesses a radiation source for a radiation practice.

(2) For section 28(2)(g) of the Act, the radiation safety and protection plan for the practice must state the maximum intervals at which a radiation safety officer appointed by the licensee for the practice is to monitor or assess the source, or premises at which the practice is being carried out, to identify whether the relevant radiation safety standard for the source or premises is being complied with.

## PART 6—RADIATION SAFETY OFFICERS

### 27 Qualifications—Act, s 36(3)

For section 36(3)<sup>9</sup> of the Act, a possession licensee who is not a qualified person may appoint himself or herself as a radiation safety officer for a radiation practice stated in schedule 3, column 1 if the licensee is the holder of a qualification stated in schedule 3, column 2 shown opposite the practice.

### 28 Functions—Act, s 37(2)(b)(iii) and 224(5)(b)(iii)

(1) For section 37(2)(b)(iii)<sup>10</sup> of the Act, the other persons are—

- (a) persons who observe the carrying out of the radiation practice, other than persons stated in section 37(2)(b)(i) and (ii) of the Act; and
- (b) if the radiation practice is a diagnostic or therapeutic procedure involving the irradiation of a person (the **“treated person”**)—persons involved in carrying out the procedure, other than the treated person and persons stated in section 37(2)(b)(i) and (ii) of the Act.

(2) For section 224(5)(b)(iii)<sup>11</sup> of the Act, the other persons are—

- (a) persons who observe the carrying out of the radiation practice, other than persons stated in section 224(5)(b)(i) and (ii) of the Act; and
- (b) if the radiation practice is a diagnostic or therapeutic procedure involving the irradiation of a person (also the **“treated person”**)—persons involved in carrying out the procedure, other than the treated person and persons stated in section 224(5)(b)(i) and (ii) of the Act.

---

9 Section 36 (Who may be appointed) of the Act

10 Section 37 (Functions) of the Act

11 Section 224 (Radiation safety officers) of the Act

## **PART 7—RADIATION MONITORING**

### **29 Information in personal monitoring records—Act, s 38(4)(b)**

For section 38(4)(b)<sup>12</sup> of the Act, the other information is the following—

- (a) the name, gender and date of birth of the monitored person;
- (b) the name and postal address of the licensee;
- (c) the date the monitored person started to be monitored for any radiation doses received in relation to the carrying out of the practice;
- (d) the date the monitored person ceased to be monitored for any radiation doses received in relation to the carrying out of the practice;
- (e) details of the basis for the monitored person being required to be provided, or wear, a personal monitoring device;
- (f) the type of radiation to which the monitored person has been exposed in relation to the carrying out of the practice;
- (g) the period the assessment of a personal monitoring device worn by the monitored person, in relation to the carrying out of the practice, relates to;
- (h) the estimated total effective dose, determined as a result of the assessment, for the monitored person for the period;
- (i) details of the methodology used in the assessment.

---

<sup>12</sup> Section 38 (Radiation monitoring—possession and use licensees) of the Act

## **PART 8—RADIATION DOSE LIMITS**

### *Division 1—Ionising radiation*

#### **30 Radiation dose limits applying for occupational exposure of persons—Act, ss 37(2)(c)(i), 41(5), 42(2), 127(1)(b), 132(4)(b), 133(2)(c) and 224(5)(c)(i)**

(1) This section applies if a possession licensee, under the licence, possesses an ionising radiation source for a radiation practice.

(2) For sections 37(2)(c)(i), 41(5), 42(2), 127(1)(b), 132(4)(b), 133(2)(c) and 224(5)(c)(i)<sup>13</sup> of the Act, the radiation dose limits applying to the occupational exposure of a person to ionising radiation while involved in carrying out the practice are as follows—

- (a) the average of the annual total effective doses for the person, over a 5 year period, must not be more than 20 mSv a year;
- (b) the total effective dose for the person must not be more than 50 mSv a year;
- (c) the equivalent dose for each lens of the person's eyes must not be more than 150 mSv a year;
- (d) the equivalent dose for each of the person's hands and feet must not be more than 500 mSv a year;
- (e) the equivalent dose for a square centimetre of the person's skin must not be more than 500 mSv a year.

(3) For sections 37(2)(c)(i), 41(5), 42(2), 127(1)(b), 132(4)(b), 133(2)(c) and 224(5)(c)(i) of the Act, the radiation dose limits applying to the occupational exposure of a person to ionising radiation emitted from the source, other than while involved in carrying out the practice, are as follows—

- (a) the total effective dose for the person must not be more than 1 mSv a year;

---

13 Sections 37 (Functions), 41 (Diagnostic or therapeutic procedures), 42 (Causing radiation exposure) 127 (Inspector's power to seize dangerous things), 132 (Receipts for seized things), 133 (Forfeiture of seized things) and 224 (Radiation safety officers) of the Act

- (b) the equivalent dose for each lens of the person's eyes must not be more than 15 mSv a year;
- (c) the equivalent dose for a square centimetre of the person's skin must not be more than 50 mSv a year.

**31 Radiation dose limits applying for public exposure of persons—Act, ss 37(2)(c)(i), 42(2), 127(1)(b), 132(4)(b), 133(2)(c) and 224(5)(c)(i)**

(1) This section applies if a possession licensee, under the licence, possesses an ionising radiation source for a radiation practice.

(2) For sections 37(2)(c)(i), 42(2), 127(1)(b), 132(4)(b), 133(2)(c) and 224(5)(c)(i) of the Act, the radiation dose limits applying to the public exposure of a person to ionising radiation while the practice is carried out are as follows—

- (a) the total effective dose for the person must not be more than 1 mSv a year;
- (b) the equivalent dose for each lens of the person's eyes must not be more than 15 mSv a year;
- (c) the equivalent dose for a square centimetre of the person's skin must not be more than 50 mSv a year.

(3) Subsection (2) does not apply if the person is exposed—

- (a) if the practice is a diagnostic or therapeutic procedure involving the irradiation of another person—while involved in carrying out the procedure; or
- (b) while involved in carrying out the practice, as a voluntary participant in health-related research.

**32 Radiation dose limits applying for the carrying out of a diagnostic or therapeutic procedure involving the irradiation of a person—Act, ss 37(2)(c)(i), 41(5), 127(1)(b), 132(4)(b), 133(2)(c) and 224(5)(c)(i)**

(1) This section applies if—

- (a) a use licensee, under the licence, is using an ionising radiation source to carry out a diagnostic or therapeutic procedure involving the irradiation of a person (the “**treated person**”); and

- (b) a person, other than the treated person, involved in carrying out the procedure is exposed to ionising radiation.

(2) For sections 37(2)(c)(i), 41(5), 127(1)(b), 132(4)(b), 133(2)(c) and 224(5)(c)(i) of the Act, the radiation dose limit applying to the exposure is a total effective dose of 5 mSv a year.

(3) Subsection (2) does not apply if the exposure is an occupational exposure to the radiation.

### **33 Radiation dose limits applying for persons voluntarily participating in health-related research—Act, ss 42(2), 127(1)(b), 132(4)(b) and 133(2)(c)**

(1) This section applies if—

- (a) a possession licensee, under the licence, possesses an ionising radiation source for a radiation practice; and
- (b) a person is exposed to ionising radiation, while involved in carrying out the practice, as a voluntary participant in health-related research.

(2) For sections 42(2), 127(1)(b), 132(4)(b) and 133(2)(c) of the Act, the radiation dose limits applying to the exposure are—

- (a) if the person is a child—a total effective dose of 5 mSv over the period starting on the day the person started to be involved in the research and ending on the day before the person turns 18 years; and
- (b) if the person is an adult—
- (i) the total effective dose for the person, over a 5 year period, must not be more than 10 mSv; and
- (ii) the total effective dose for the person must not be more than 5 mSv a year.

### **34 Supply of personal monitoring devices—Act, s 28(3)**

For section 28(3)<sup>14</sup> of the Act, the radiation dose limit for ionising radiation is a total effective dose of 1 mSv a year.

---

14 Section 28 (What is a “radiation safety and protection plan”) of the Act

**35 Pregnant women—Act, ss 37(2)(c)(i), 41(5), 42(2), 127(1)(b), 132(4)(b), 133(2)(c) and 224(5)(c)(i)**

(1) This section applies if a possession licensee, under the licence, possesses an ionising radiation source for a radiation practice.

(2) For sections 37(2)(c)(i), 41(5), 42(2), 127(1)(b), 132(4)(b), 133(2)(c) and 224(5)(c)(i) of the Act, the radiation dose limit applying to the occupational exposure of a pregnant woman to ionising radiation while involved in carrying out the practice is a total effective dose of 1 mSv a year.

(3) However, for 127(1)(b) of the Act, subsection (2) only applies if the inspector is aware, or ought reasonably be aware, the woman is pregnant.

(4) Also, subsection (2) does not apply if—

- (a) for section 41(5) of the Act—the use licensee who, under the licence, uses the source to carry out the practice is not aware, or could not reasonably be aware, the woman is pregnant; or
- (b) for section 42(2) of the Act—the person carrying out the practice is not aware, or could not reasonably be aware, the woman is pregnant.

**35A Mineral substances that are not radioactive substances**

(1) This section applies to a person who possesses a mineral substance that is a radioactive material but that is not a radioactive substance.

(2) The person must ensure that another person does not receive a total effective dose from ionising radiation emitted from the substance that is—

- (a) for public exposure of the other person—more than 1 mSv a year; or
- (b) for occupational exposure of the other person—more than 20 mSv a year.

Maximum penalty—20 penalty units.



***Division 2—Non-ionising radiation*****36 Functions of radiation safety officers—Act, s 37(2)(c)(ii) and 224(5)(c)(ii)**

For section 37(2)(c)(ii) and 224(5)(c)(ii) of the Act, the radiation dose limits for non-ionising radiation emitted by a laser apparatus used to carry out a diagnostic, therapeutic or cosmetic procedure involving the irradiation of a person are stated in tables 7 and 8 of the laser standard.

**37 Carrying out diagnostic or therapeutic procedures involving the irradiation of a person—Act, s 41(5)**

For section 41(5) of the Act, the radiation dose limits for non-ionising radiation emitted by a laser apparatus used to carry out a diagnostic or therapeutic procedure involving the irradiation of a person are stated in tables 7 and 8 of the laser standard.

**38 Carrying out cosmetic procedures involving the irradiation of a person—Act, s 42(2)**

For section 42(2) of the Act, the radiation dose limits for non-ionising radiation emitted by a laser apparatus used to carry out a cosmetic procedure involving the irradiation of a person are stated in tables 7 and 8 of the laser standard.

**39 Seizing dangerous things—Act, ss 127(1)(b), 132(4)(b) and 133(2)(c)**

For sections 127(1)(b), 132(4)(b) and 133(2)(c) of the Act, the radiation dose limits for non-ionising radiation emitted by a laser apparatus used to carry out a diagnostic, therapeutic or cosmetic procedure involving the irradiation of a person are stated in tables 7 and 8 of the laser standard.

## **PART 8A—AUTHORISED PERSONS**

### **39A Authorised persons for diagnostic or therapeutic procedures—Act, s 41**

(1) For section 41(1)<sup>15</sup> of the Act—

- (a) for a diagnostic procedure stated in schedule 3A, part 1, column 1, a person stated in schedule 3A, part 1, column 2 opposite the procedure is an authorised person; and
- (b) for a therapeutic procedure stated in schedule 3A, part 2, column 1, a person stated in schedule 3A, part 2, column 2 opposite the procedure is an authorised person.

## **PART 9—EXEMPTIONS**

### *Division 1—Requirement for use licence*

### **40 Prescribed radiation practices—Act, s 13(3)**

(1) For section 13(3)<sup>16</sup> of the Act, the following are prescribed radiation practices—

- (a) industrial radiography involving the use of an ionising radiation source;
- (b) borehole logging involving the use of a sealed source apparatus;
- (c) density-gauging, or moisture-gauging, for geo-technical purposes, involving the use of a sealed source apparatus;
- (d) the preparation of a radioactive substance or radiation apparatus, or assembly of a sealed source apparatus, for use in carrying out a diagnostic or therapeutic procedure involving the irradiation of a person;

---

15 Section 41 (Diagnostic or therapeutic procedures)

16 Section 13 (Requirement for use licence) of the Act

- (e) the maintenance, servicing or repair of radiation sources or sealed source apparatus;
- (f) the compliance testing of a radiation source by a qualified accredited person for a radiation source of that type, involving the use of the source or another radiation source;
- (g) the compliance testing of premises by a qualified accredited person for premises of that type, involving the use of a radiation source;
- (h) the undertaking of quality control procedures, in relation to—
  - (i) a radiation source, involving the use of another radiation source; or
  - (ii) a sealed source apparatus, involving the use of a radiation source.

(2) In this section—

**“compliance testing”**, of a radiation source or premises, means assessing whether the source or premises complies with the relevant radiation safety standard.

**“qualified accredited person”**, for a type of radiation source or premises, means an accredited person who, under the person’s accreditation certificate, is allowed to issue a certificate of compliance for the type of radiation source or premises.

#### **41 Training—Act, s 13(2)(b)(ii)**

For section 13(2)(b)(ii) of the Act, the following is training—

- (a) training at an educational institution, other than training involving the actual irradiation by the trainee of a person as part of a diagnostic or therapeutic procedure;
- (b) undertaking a course or subject stated in schedule 4.

***Division 2—Radiation sources*****42 Exemption from requirement for possession licence—Act, s 210**

For section 210<sup>17</sup> of the Act, a radioactive substance containing the radionuclide nickel-63 or hydrogen-3 is exempt from section 12<sup>18</sup> of the Act if—

- (a) it is incorporated in a sealed source apparatus; and
- (b) the apparatus is used for gas chromatography.

**43 Exemption from requirement for use licence—Act, s 210**

For section 210 of the Act, the following radiation sources are exempt from section 13 of the Act—

- (a) if a sealed source apparatus, incorporating a sealed radioactive substance, is used for chemical analysis or industrial gauging—the substance;
- (b) a radiation apparatus used for industrial gauging;
- (c) a cabinet radiation apparatus used for its intended use;
- (d) an enclosed radiation apparatus used for its intended use;
- (e) a radiation source used for sterilising things;
- (f) a sealed radioactive substance, having an activity of not more than 370 MBq, used for—
  - (i) calibration checks of measuring instruments; or
  - (ii) quality control procedures undertaken for—
    - (A) another radiation source or a sealed source apparatus;  
or
    - (B) if another radiation source is used to carry out a radiation practice involving the production of images—any ancillary imaging equipment used in connection with the use of the other source to carry out the practice;

---

17 Section 210 (Limited exemption for radiation source) of the Act

18 Section 12 (Requirement for possession licence) of the Act

- (g) a sealed radioactive substance, having an activity of not more than 4 MBq, used for transferring anatomical landmarks to images produced using a gamma camera;
- (h) a radioactive substance, having an activity of not more than 500 kBq, used for an in vitro test;
- (i) a sealed radioactive substance used for static elimination.

#### **44 Exemption from requirement for transport licence—Act, s 210**

(1) For section 210 of the Act, a radioactive substance enclosed in an excepted package is exempt from sections 14 and 15<sup>19</sup> of the Act if the package is transported in accordance with the transport code of practice.

(2) Subsection (3) applies to a sealed radioactive substance incorporated in a sealed source apparatus, if the apparatus is used by a use licensee under a use licence to carry out 1 of the following radiation practices—

- (a) borehole logging;
- (b) density-gauging, or moisture-gauging, for geo-technical purposes;
- (c) industrial radiography.

(3) For section 210 of the Act, the substance is exempt from sections 14 and 15 of the Act if the apparatus is transported by the licensee in accordance with the transport code of practice.

(4) In this section—

“**excepted package**” has the meaning given in the transport code of practice.

#### **45 Smoke detectors—Act, s 210**

(1) Subsection (2) applies to a radioactive substance, containing the radionuclide americium-241 having an activity of not more than 37 kBq, incorporated in an ionisation chamber smoke detector.

---

19 Sections 14 (Requirement for transport licence—transport by road) and 15 (Requirement for transport licence—transport otherwise than by road) of the Act

(2) For section 210 of the Act, the substance is exempt from sections 12, 13 and 26<sup>20</sup> of the Act if the detector was manufactured in accordance with sections 2 to 4 of AS 3786-1993 (Smoke alarms), 2nd ed.<sup>21</sup>

(3) Subsection (4) applies to—

- (a) a radioactive substance, containing the radionuclide americium-241 having an activity of more than 37 kBq, incorporated in an ionisation chamber smoke detector; or
- (b) a radioactive substance, containing a radionuclide other than the radionuclide americium-241, incorporated in an ionisation chamber smoke detector.

(4) For section 210 of the Act, the substance is exempt from sections 12 and 13 of the Act if the detector was—

- (a) acquired before 1 January 2000; or
- (b) manufactured in accordance with AS 1603.2-1990 (Automatic fire detection and alarm systems, Part 2: Point type smoke detectors).

(5) To remove doubt, it is declared that subsections (2) and (4) do not apply while the detector is being manufactured or repaired.

#### **46 Certain radioactive substances, incorporated in items to produce light—Act, s 210**

(1) For section 210 of the Act, a radioactive substance containing the radionuclide promethium-147, radium-226 or hydrogen-3, incorporated in an item to produce light is exempt from sections 12, 13 and 26 of the Act.

(2) Subsection (1) does not apply if the item is a gaseous tritium light device.

(3) Also, to remove doubt, it is declared that subsection (1) does not apply while the item is being manufactured or repaired.

---

20 Sections 12 (Requirement for possession licence), 13 (Requirement for use licence) and 26 (Disposal of radioactive material) of the Act

21 Copies of the standard and other Australian Standards and Australian/New Zealand Standards referred to in this regulation are available from Standards Australia, 232 St Pauls Terrace, Fortitude Valley, Brisbane.

**47 Gaseous tritium light devices—Act, s 210**

For section 210 of the Act, a radioactive substance containing the radionuclide hydrogen-3 with an activity of less than 74 GBq, incorporated in a gaseous tritium light device, is exempt from sections 12 and 13 of the Act if the device—

- (a) is being used as a safety, or warning, sign; and
- (b) complies with sections 2, 4 and 5 of the document entitled ‘Appendix XXXIX—Recommendations for exemptions from licensing of gaseous tritium light devices’ prepared by NHMRC.

**48 Depleted uranium—Act, s 210**

(1) For section 210 of the Act, depleted uranium is exempt from sections 12, 14 and 15 of the Act if it is—

- (a) being used as—
  - (i) radiation shielding for a container designed to contain radioactive substances; or
  - (ii) ballast in an aircraft or ship; and
- (b) totally encased in a metallic sheath; and
- (c) in solid massive form.

(2) In this section—

“**depleted uranium**” means uranium containing less than 0.72 % of the radionuclide uranium-235.

**49 Sealed radioactive substances used in teaching—Act, s 210**

(1) This section applies to a sealed radioactive substance containing a radionuclide mentioned in column 1 of the following table if the activity of the radionuclide is not more than the activity mentioned in column 2 of the table shown opposite the radionuclide—

**Table**

<b>Column 1</b>	<b>Column 2</b>
<b>Radionuclide</b>	<b>Activity (kBq)</b>
cobalt-60	200
strontium-90	80
caesium-137	200
radium-226	20
americium-241	20

(2) For section 210 of the Act, the substance is exempt from section 13 of the Act if it is being used for teaching the characteristics and properties of radiation or radiation sources.

#### **50 Minerals—Act, s 210**

(1) This section applies to a mineral that is a radioactive substance.

(2) For section 210 of the Act, the mineral is exempt from section 12 of the Act if—

- (a) it emits radiation at a level not more than 5 micrograys an hour, measured at a distance of 10 cm from its surface; and
- (b) it is being used—
  - (i) as a sample in teaching; or
  - (ii) for display as a geological specimen.

#### **51 Abrasive blasting material containing radionuclides—Act, s 210**

(1) This section applies to abrasive blasting material, containing radionuclides, if it is being used in abrasive blasting.

(2) Subsection (3) applies if—

- (a) the material is a radioactive substance; and
- (b) the material contains thorium or uranium radionuclides.



(3) For section 210 of the Act, the material is exempt from section 12 of the Act if the amount worked out, using the following formula, in relation to the material is not more than 1—

$$(0.1 \times U) + (0.2 \times Th)$$

where—

“Th” means the total concentration, stated in Bq a gram, of any thorium radionuclides and their progeny contained in the material.

“U” means the total concentration, stated in Bq a gram, of any uranium radionuclides and their progeny contained in the material.

(4) Further, material that is, under subsection (3), exempt from section 12 of the Act is also exempt from section 26 of the Act if the gross alpha and gross beta concentrations in the leachate, determined as a result of carrying out the TCLP in relation to the material, are not each more than the amount worked out by multiplying the relevant concentration stated in the document entitled ‘Australian Drinking Water Guidelines’, jointly prepared by NHMRC and ARMCANZ,<sup>22</sup> by 10.

## **52 Mineral substances—Act, s 210**

(1) Subsection (2) applies to a mineral substance being disposed of, other than into the air, water or sewerage system.

(2) The substance is exempt from section 26 of the Act if—

- (a) the gross alpha and gross beta concentrations in the leachate, determined as a result of carrying out the TCLP in relation to the substance, are not each more than the amount worked out by multiplying the relevant concentration stated in the document entitled ‘Australian Drinking Water Guidelines’, jointly prepared by NHMRC and ARMCANZ, by 10; and
- (b) for a substance that contains—
  - (i) only 1 of the radionuclides stated in schedule 1, column 1—the concentration of the radionuclide is less than the amount worked out by multiplying the concentration

---

<sup>22</sup> The document and the documents referred to in section 52(2)(a) and schedule 6, definition “transport code of practice” are available from Australian Government Publishing Service, City Plaza, corner Adelaide and George Streets, Brisbane.

stated in schedule 1, column 2 shown opposite the radionuclide by 10; or

- (ii) more than 1 of the radionuclides stated in schedule 1, column 1—the substance’s disposal factor is not more than 1.

(3) In this section—

“**disposal factor**”, for a mineral substance containing more than 1 of the radionuclides stated in schedule 1, column 1, means the total of the amounts worked out by applying the following formula to each of the radionuclides—

$$\frac{C}{MC}$$

where—

“**C**”, for a radionuclide, means the radionuclide’s concentration, measured in Bq a gram.

“**MC**”, for a radionuclide, means the amount worked out by multiplying the concentration stated in schedule 1, column 2 shown opposite the radionuclide by 10.

**53 Persons who have been injected with a radioactive substance etc. as part of a diagnostic or therapeutic procedure—Act, s 210**

(1) This section applies if—

- (a) a person has been injected with a radioactive substance, or a radioactive substance has been administered to or implanted in a person, as part of a diagnostic or therapeutic procedure; and
- (b) the person disposes of the substance’s radionuclide as part of his or her bodily waste.

(2) For section 210 of the Act, the waste is exempt from section 26 of the Act.

## **PART 9A—REGISTERS**

### **53A Register of licensees—Act, s 207**

For section 207(2)<sup>23</sup> of the Act, the register the chief executive must keep about licensees must contain the following information about a licensee—

- (a) the licensee's name;
- (b) the licence number;
- (c) the licence type;
- (d) the expiry date of the licence;
- (e) any conditions on the licence;
- (f) if the licensee is a possession licensee—
  - (i) particulars of the radiation source the licensee is allowed to possess; and
  - (ii) the radiation practice for which the licensee is allowed to possess the source;
- (g) if the licensee is a use licensee—
  - (i) particulars of the radiation source the licensee is allowed to use; and
  - (ii) the radiation practice the licensee is allowed to carry out using the source;
- (h) if the licensee is a transport licensee—
  - (i) particulars of the radioactive substance the licensee is allowed to transport; and
  - (ii) how the substance is to be transported; and
  - (iii) the amount of the substance the licensee is allowed to transport at a time.

---

23 Section 207 (Register to be kept) of the Act

**53B Register of accredited persons—Act, s 207**

For section 207(2) of the Act, the register the chief executive must keep about accredited persons must contain the following information about an accredited person—

- (a) the accredited person's name;
- (b) the accreditation certificate number;
- (c) the expiry date of the accreditation certificate;
- (d) any conditions on the accreditation certificate;
- (e) the type of radiation source or premises for which the accredited person may issue a certificate;
- (f) the accredited person's contact details.

*Examples of contact details—*

Address, telephone number, facsimile number, email address.

**53C Register of qualified persons—Act, s 207**

For section 207(2) of the Act, the register the chief executive must keep about qualified persons must contain the following information about a qualified person—

- (a) the qualified person's name;
- (b) the radiation safety officer certificate number;
- (c) the expiry date of the radiation safety officer certificate;
- (d) any conditions on the radiation safety officer certificate;
- (e) the radiation practice for which the qualified person may perform the functions of a radiation safety officer.

**53D Register of inspectors—Act, s 207**

For section 207(2) of the Act, the register the chief executive must keep about inspectors must contain the following information about an inspector—

- (a) the inspector's name;

- (b) if the inspector is appointed for a term—the term of the appointment;
- (c) any conditions of the inspector's appointment.

**53E Register of State radiation analysts—Act, s 207**

For section 207(2) of the Act, the register the chief executive must keep about State radiation analysts must contain the following information about a State radiation analyst—

- (a) the State radiation analyst's name;
- (b) if the State radiation analyst is appointed for a term—the term of the appointment;
- (c) any conditions of the State radiation analyst's appointment.

**PART 9B—DISCLOSURE OF PROTECTED INFORMATION****53F Disclosure of protected information**

For section 209(4)<sup>24</sup> of the Act, the purposes for which protected information may be disclosed by the chief executive are as follows—

- (a) for the development of a plan to avoid or limit the impact of an emergency situation upon persons, property or the environment;
- (b) to enable persons dealing with an emergency situation to know the hazards, or possible hazards, the persons may face in dealing with the emergency situation.

---

24 Section 209 (Confidentiality of information) of the Act

## **PART 10—FEES**

### **54 Fees—general**

The fees payable under the Act are stated in schedule 5.

### **55 Fees—Act, s 51(1)(c)(i)**

(1) Subsection (2) applies to an application for a possession licence for the possession of a radioactive substance for a radiation practice.

(2) For section 51(1)(c)(i)<sup>25</sup> of the Act, the fee is the total of the following—

- (a) an application fee;
- (b) a licence fee consisting of—
  - (i) a base fee; and
  - (ii) a fee calculated having regard to the number of sealed radioactive substances, or types of unsealed radioactive substances, the subject of the application.

(3) Subsection (4) applies to an application for a possession licence for the possession of a radiation apparatus for a radiation practice.

(4) For section 51(1)(c)(i) of the Act, the fee is the total of the following—

- (a) an application fee;
- (b) a licence fee consisting of—
  - (i) a base fee; and
  - (ii) a fee calculated having regard to the number of radiation apparatus the subject of the application.

(5) Subsection (6) applies to an application for a use or transport licence.

(6) For section 51(1)(c)(i) of the Act, the fee is the total of the following—

- (a) an application fee;
- (b) a licence fee.

---

25 Section 51 (Procedural requirements for applications) of the Act

(7) Subsection (8) applies to an application for an accreditation certificate.

(8) For section 51(1)(c)(i) of the Act, the fee is the total of the following—

- (a) an application fee;
- (b) an accreditation certificate fee.

(9) Subsection (10) applies to an application for a radiation safety officer certificate.

(10) For section 51(1)(c)(i) of the Act, the fee is the total of the following—

- (a) an application fee;
- (b) a radiation safety officer certificate fee.

## **56 Fees—Act, s 79(2)(b)(i)**

(1) Subsection (2) applies to an application for the renewal of a possession licence for the possession of a radioactive substance for a radiation practice.

(2) For section 79(2)(b)(i)<sup>26</sup> of the Act, the fee is the total of the following—

- (a) a base fee;
- (b) a fee calculated having regard to the number of sealed radioactive substances, or types of unsealed radioactive substances, the subject of the application.

(3) Subsection (4) applies to an application for the renewal of a possession licence for the possession of a radiation apparatus for a radiation practice.

(4) For section 79(2)(b)(i) of the Act, the fee is the total of the following—

- (a) a base fee;
- (b) a fee calculated having regard to the number of radiation apparatus the subject of the application.

---

26 Section 79 (Applications for renewal) of the Act

(5) Subsection (6) applies to an application for the renewal of a use or transport licence.

(6) For section 79(2)(b)(i) of the Act, the fee is a licence fee.

(7) Subsection (8) applies to an application for the renewal of an accreditation certificate.

(8) For section 79(2)(b)(i) of the Act, the fee is an accreditation certificate fee.

(9) Subsection (10) applies to an application for the renewal of a radiation safety officer certificate.

(10) For section 79(2)(b)(i) of the Act, the fee is a radiation safety officer certificate fee.

## **57 Waiver of fees—general**

(1) Subsection (2) applies if—

- (a) under section 220<sup>27</sup> of the Act, a person is taken to be the holder of a column 2 licence; and
- (b) before the expiry of the licence, the person applies for the same type of licence.

(2) The application fee, payable under this regulation, for the licence is not payable by the person.

(3) Subsection (4) applies if a person—

- (a) is required to use a radiation source in the course of the person's study or training at an educational institution; and
- (b) under the Act, the person needs a use licence allowing the use of the source.

(4) The application fee and licence fee, payable under this regulation, for the licence are not payable by the person.

(5) Subsection (6) applies if—

- (a) under section 224(3)<sup>28</sup> of the Act, a person is taken to be a radiation safety officer for a radiation practice; and

---

27 Section 220 (Existing licences) of the Act

28 Section 224 (Radiation safety officers) of the Act



- (b) while continuing as a radiation safety officer for the practice, the person applies for a radiation safety officer certificate.

(6) The application fee, payable under this regulation, for the certificate is not payable by the person.

(7) Subsection (8) applies to a use licensee who, under the licence, is allowed to use a radiation source to carry out a diagnostic or therapeutic procedure involving the irradiation of a person.

(8) If the licensee applies for another use licence to carry out a diagnostic or therapeutic procedure involving the irradiation of a person, the application fee, payable under this regulation, for the licence is not payable by the licensee.

(9) The following fees are not payable by the State—

- (a) the fees stated in schedule 5, parts 1 and 4;
- (b) the fee for an approval to dispose.

### **57A Waiver of fees—undergraduates' professional development year**

(1) This section applies to a graduate practitioner who, after 31 December 1999—

- (a) undertakes his or her professional development year; and
- (b) applies for a use licence to carry out a diagnostic or therapeutic procedure involving the irradiation of another person during the person's professional development year.

(2) The application fee payable under this regulation for the licence is not payable by the graduate practitioner.

(3) In this section—

**“accrediting body”** means the Australian Institute of Radiography or the Australian and New Zealand Society of Nuclear Medicine.

**“graduate practitioner”** means a person who—

- (a) is a graduate from an undergraduate medical radiation science degree course accredited by an accrediting body, regardless of the title of the course; or
- (b) is assessed by an accrediting body to be the equivalent of a person mentioned in paragraph (a).

**“professional development year”** means the period, the equivalent of 48 weeks full time work, during which a graduate practitioner must work under the guidance of another practitioner before the graduate practitioner is recognised as an accredited practitioner by an accrediting body.

## **58 Refund of fees**

The chief executive must as soon as practicable refund the fees, other than the application fee, paid on an application for the grant or renewal of an accreditation certificate, licence or radiation safety officer certificate if—

- (a) the chief executive refuses to grant the application; or
- (b) the applicant withdraws the application before it is decided.

**SCHEDULE 1****RADIONUCLIDE CONCENTRATIONS AND  
ACTIVITIES**

sections 4, 5, 12 and 52

<b>Item</b>	<b>Column 1 Radionuclide</b>	<b>Column 2 Concentration (Bq/g)</b>	<b>Column 3 Activity (Bq)</b>
1	Actinium-225	$1 \times 10^{+1}$	$1 \times 10^{+4}$
2	Actinium-227	$1 \times 10^{+1}$	$1 \times 10^{+3}$
3	Actinium-228	$1 \times 10^{+1}$	$1 \times 10^{+6}$
4	Aluminium-26	$1 \times 10^{+1}$	$1 \times 10^{+4}$
5	Americium-241	$1 \times 10^0$	$1 \times 10^{+4}$
6	Americium-242	$1 \times 10^{+3}$	$1 \times 10^{+6}$
7	Americium-242m <sup>1</sup>	$1 \times 10^0$	$1 \times 10^{+4}$
8	Americium-243 <sup>1</sup>	$1 \times 10^0$	$1 \times 10^{+3}$
9	Antimony-122	$1 \times 10^{+2}$	$1 \times 10^{+4}$
10	Antimony-124	$1 \times 10^{+1}$	$1 \times 10^{+6}$
11	Antimony-125	$1 \times 10^{+2}$	$1 \times 10^{+6}$
12	Argon-37	$1 \times 10^{+6}$	$1 \times 10^{+8}$
13	Argon-41	$1 \times 10^{+2}$	$1 \times 10^{+9}$
14	Arsenic-72	$1 \times 10^{+1}$	$1 \times 10^{+4}$
15	Arsenic-73	$1 \times 10^{+3}$	$1 \times 10^{+7}$
16	Arsenic-74	$1 \times 10^{+1}$	$1 \times 10^{+6}$
17	Arsenic-76	$1 \times 10^{+2}$	$1 \times 10^{+5}$
18	Arsenic-77	$1 \times 10^{+3}$	$1 \times 10^{+6}$
19	Astatine-211	$1 \times 10^{+3}$	$1 \times 10^{+7}$
20	Barium-128	$1 \times 10^{+1}$	$1 \times 10^{+4}$
21	Barium-131	$1 \times 10^{+2}$	$1 \times 10^{+6}$
22	Barium-133	$1 \times 10^{+2}$	$1 \times 10^{+6}$
23	Barium-140 <sup>1</sup>	$1 \times 10^{+1}$	$1 \times 10^{+5}$
24	Berkelium-249	$1 \times 10^{+3}$	$1 \times 10^{+6}$
25	Beryllium-7	$1 \times 10^{+3}$	$1 \times 10^{+7}$
26	Bismuth-206	$1 \times 10^{+1}$	$1 \times 10^{+5}$

## SCHEDULE 1 (continued)

<b>Item</b>	<b>Column 1 Radionuclide</b>	<b>Column 2 Concentration (Bq/g)</b>	<b>Column 3 Activity (Bq)</b>
27	Bismuth-207	$1 \times 10^{+1}$	$1 \times 10^{+6}$
28	Bismuth-210	$1 \times 10^{+3}$	$1 \times 10^{+6}$
29	Bismuth-212 <sup>1</sup>	$1 \times 10^{+1}$	$1 \times 10^{+5}$
30	Bismuth-213	$1 \times 10^{+2}$	$1 \times 10^{+6}$
31	Bromine-75	$1 \times 10^{+1}$	$1 \times 10^{+6}$
32	Bromine-76	$1 \times 10^{+1}$	$1 \times 10^{+5}$
33	Bromine-77	$1 \times 10^{+1}$	$1 \times 10^{+4}$
34	Bromine-82	$1 \times 10^{+1}$	$1 \times 10^{+6}$
35	Cadmium-109	$1 \times 10^{+4}$	$1 \times 10^{+6}$
36	Cadmium-115	$1 \times 10^{+2}$	$1 \times 10^{+6}$
37	Cadmium-115m	$1 \times 10^{+3}$	$1 \times 10^{+6}$
38	Caesium-129	$1 \times 10^{+2}$	$1 \times 10^{+5}$
39	Caesium-131	$1 \times 10^{+3}$	$1 \times 10^{+6}$
40	Caesium-132	$1 \times 10^{+1}$	$1 \times 10^{+5}$
41	Caesium-134	$1 \times 10^{+1}$	$1 \times 10^{+4}$
42	Caesium-134m	$1 \times 10^{+3}$	$1 \times 10^{+5}$
43	Caesium-135	$1 \times 10^{+4}$	$1 \times 10^{+7}$
44	Caesium-136	$1 \times 10^{+1}$	$1 \times 10^{+5}$
45	Caesium-137 <sup>1</sup>	$1 \times 10^{+1}$	$1 \times 10^{+4}$
46	Caesium-138	$1 \times 10^{+1}$	$1 \times 10^{+4}$
47	Calcium-47	$1 \times 10^{+1}$	$1 \times 10^{+6}$
48	Calcium-45	$1 \times 10^{+4}$	$1 \times 10^{+7}$
49	Californium-246	$1 \times 10^{+3}$	$1 \times 10^{+6}$
50	Californium-248	$1 \times 10^{+1}$	$1 \times 10^{+4}$
51	Californium-249	$1 \times 10^0$	$1 \times 10^{+3}$
52	Californium-250	$1 \times 10^{+1}$	$1 \times 10^{+4}$
53	Californium-251	$1 \times 10^0$	$1 \times 10^{+3}$
54	Californium-252	$1 \times 10^{+1}$	$1 \times 10^{+4}$
55	Californium-253	$1 \times 10^{+2}$	$1 \times 10^{+5}$
56	Californium-254	$1 \times 10^0$	$1 \times 10^{+3}$
57	Carbon-14	$1 \times 10^{+4}$	$1 \times 10^{+7}$
58	Carbon-11	$1 \times 10^{+1}$	$1 \times 10^{+6}$
59	Cerium-139	$1 \times 10^{+2}$	$1 \times 10^{+6}$
60	Cerium-141	$1 \times 10^{+2}$	$1 \times 10^{+7}$
61	Cerium-143	$1 \times 10^{+2}$	$1 \times 10^{+6}$

## SCHEDULE 1 (continued)

<b>Item</b>	<b>Column 1 Radionuclide</b>	<b>Column 2 Concentration (Bq/g)</b>	<b>Column 3 Activity (Bq)</b>
62	Cerium-144 <sup>1</sup>	1 x 10 <sup>+2</sup>	1 x 10 <sup>+5</sup>
63	Chlorine-36	1 x 10 <sup>+4</sup>	1 x 10 <sup>+6</sup>
64	Chlorine-38	1 x 10 <sup>+1</sup>	1 x 10 <sup>+5</sup>
65	Chromium-51	1 x 10 <sup>+3</sup>	1 x 10 <sup>+7</sup>
66	Cobalt-57	1 x 10 <sup>+2</sup>	1 x 10 <sup>+6</sup>
67	Cobalt-56	1 x 10 <sup>+1</sup>	1 x 10 <sup>+5</sup>
68	Cobalt-55	1 x 10 <sup>+1</sup>	1 x 10 <sup>+6</sup>
69	Cobalt-62m	1 x 10 <sup>+1</sup>	1 x 10 <sup>+5</sup>
70	Cobalt-60m	1 x 10 <sup>+3</sup>	1 x 10 <sup>+6</sup>
71	Cobalt-60	1 x 10 <sup>+1</sup>	1 x 10 <sup>+5</sup>
72	Cobalt-58	1 x 10 <sup>+1</sup>	1 x 10 <sup>+6</sup>
73	Cobalt-61	1 x 10 <sup>+2</sup>	1 x 10 <sup>+6</sup>
74	Cobalt-58m	1 x 10 <sup>+4</sup>	1 x 10 <sup>+7</sup>
75	Copper-64	1 x 10 <sup>+2</sup>	1 x 10 <sup>+6</sup>
76	Copper-67	1 x 10 <sup>+2</sup>	1 x 10 <sup>+6</sup>
77	Curium-242	1 x 10 <sup>+2</sup>	1 x 10 <sup>+5</sup>
78	Curium-243	1 x 10 <sup>0</sup>	1 x 10 <sup>+4</sup>
79	Curium-244	1 x 10 <sup>+1</sup>	1 x 10 <sup>+4</sup>
80	Curium-245	1 x 10 <sup>0</sup>	1 x 10 <sup>+3</sup>
81	Curium-246	1 x 10 <sup>0</sup>	1 x 10 <sup>+3</sup>
82	Curium-247	1 x 10 <sup>0</sup>	1 x 10 <sup>+4</sup>
83	Curium-248	1 x 10 <sup>0</sup>	1 x 10 <sup>+3</sup>
84	Dysprosium-165	1 x 10 <sup>+3</sup>	1 x 10 <sup>+6</sup>
85	Dysprosium-166	1 x 10 <sup>+3</sup>	1 x 10 <sup>+6</sup>
86	Einsteinium-253	1 x 10 <sup>+2</sup>	1 x 10 <sup>+5</sup>
87	Einsteinium-254	1 x 10 <sup>+1</sup>	1 x 10 <sup>+4</sup>
88	Einsteinium-254m	1 x 10 <sup>+2</sup>	1 x 10 <sup>+6</sup>
89	Erbium-161	1 x 10 <sup>+1</sup>	1 x 10 <sup>+6</sup>
90	Erbium-169	1 x 10 <sup>+4</sup>	1 x 10 <sup>+7</sup>
91	Erbium-171	1 x 10 <sup>+2</sup>	1 x 10 <sup>+6</sup>
92	Europium-152	1 x 10 <sup>+1</sup>	1 x 10 <sup>+6</sup>
93	Europium-152m	1 x 10 <sup>+2</sup>	1 x 10 <sup>+6</sup>
94	Europium-154	1 x 10 <sup>+1</sup>	1 x 10 <sup>+6</sup>
95	Europium-155	1 x 10 <sup>+2</sup>	1 x 10 <sup>+7</sup>
96	Fermium-254	1 x 10 <sup>+4</sup>	1 x 10 <sup>+7</sup>

## SCHEDULE 1 (continued)

<b>Item</b>	<b>Column 1 Radionuclide</b>	<b>Column 2 Concentration (Bq/g)</b>	<b>Column 3 Activity (Bq)</b>
97	Fermium-255	$1 \times 10^{+3}$	$1 \times 10^{+6}$
98	Fluorine-18	$1 \times 10^{+1}$	$1 \times 10^{+6}$
99	Gadolinium-146	$1 \times 10^{+1}$	$1 \times 10^{+4}$
100	Gadolinium-148	$1 \times 10^0$	$1 \times 10^{+3}$
101	Gadolinium-153	$1 \times 10^{+2}$	$1 \times 10^{+7}$
102	Gadolinium-159	$1 \times 10^{+3}$	$1 \times 10^{+6}$
103	Gallium-67	$1 \times 10^{+2}$	$1 \times 10^{+6}$
104	Gallium-68	$1 \times 10^{+1}$	$1 \times 10^{+4}$
105	Gallium-72	$1 \times 10^{+1}$	$1 \times 10^{+5}$
106	Germanium-71	$1 \times 10^{+4}$	$1 \times 10^{+8}$
107	Germanium-68	$1 \times 10^{+1}$	$1 \times 10^{+5}$
108	Gold-198	$1 \times 10^{+2}$	$1 \times 10^{+6}$
109	Gold-199	$1 \times 10^{+2}$	$1 \times 10^{+6}$
110	Hafnium-172	$1 \times 10^{+1}$	$1 \times 10^{+4}$
111	Hafnium-181	$1 \times 10^{+1}$	$1 \times 10^{+6}$
112	Holmium-163	$1 \times 10^{+1}$	$1 \times 10^{+4}$
113	Holmium-166	$1 \times 10^{+3}$	$1 \times 10^{+5}$
114	Hydrogen-3	$1 \times 10^{+6}$	$1 \times 10^{+7}$
115	Indium-111	$1 \times 10^{+2}$	$1 \times 10^{+6}$
116	Indium-113m	$1 \times 10^{+2}$	$1 \times 10^{+6}$
117	Indium-114m	$1 \times 10^{+2}$	$1 \times 10^{+6}$
118	Indium-115m	$1 \times 10^{+2}$	$1 \times 10^{+6}$
119	Iodine-123	$1 \times 10^{+2}$	$1 \times 10^{+7}$
120	Iodine-124	$1 \times 10^{+1}$	$1 \times 10^{+6}$
121	Iodine-125	$1 \times 10^{+3}$	$1 \times 10^{+6}$
122	Iodine-126	$1 \times 10^{+2}$	$1 \times 10^{+6}$
123	Iodine-129	$1 \times 10^{+2}$	$1 \times 10^{+5}$
124	Iodine-130	$1 \times 10^{+1}$	$1 \times 10^{+6}$
125	Iodine-131	$1 \times 10^{+2}$	$1 \times 10^{+5}$
126	Iodine-132	$1 \times 10^{+1}$	$1 \times 10^{+5}$
127	Iodine-133	$1 \times 10^{+1}$	$1 \times 10^{+6}$
128	Iodine-134	$1 \times 10^{+1}$	$1 \times 10^{+5}$
129	Iodine-135	$1 \times 10^{+1}$	$1 \times 10^{+6}$
130	Iridium-190	$1 \times 10^{+1}$	$1 \times 10^{+6}$
131	Iridium-192	$1 \times 10^{+1}$	$1 \times 10^{+4}$

## SCHEDULE 1 (continued)

<b>Item</b>	<b>Column 1 Radionuclide</b>	<b>Column 2 Concentration (Bq/g)</b>	<b>Column 3 Activity (Bq)</b>
132	Iridium-194	$1 \times 10^{+2}$	$1 \times 10^{+5}$
133	Iron-52	$1 \times 10^{+1}$	$1 \times 10^{+6}$
134	Iron-55	$1 \times 10^{+4}$	$1 \times 10^{+6}$
135	Iron-59	$1 \times 10^{+1}$	$1 \times 10^{+6}$
136	Krypton-74	$1 \times 10^{+2}$	$1 \times 10^{+9}$
137	Krypton-76	$1 \times 10^{+2}$	$1 \times 10^{+9}$
138	Krypton-77	$1 \times 10^{+2}$	$1 \times 10^{+9}$
139	Krypton-79	$1 \times 10^{+3}$	$1 \times 10^{+5}$
140	Krypton-81	$1 \times 10^{+4}$	$1 \times 10^{+7}$
141	Krypton-81m	$1 \times 10^{+1}$	$1 \times 10^{+4}$
142	Krypton-83m	$1 \times 10^{+5}$	$1 \times 10^{+12}$
143	Krypton-85	$1 \times 10^{+5}$	$1 \times 10^{+4}$
144	Krypton-85m	$1 \times 10^{+3}$	$1 \times 10^{+10}$
145	Krypton-87	$1 \times 10^{+2}$	$1 \times 10^{+9}$
146	Krypton-88	$1 \times 10^{+2}$	$1 \times 10^{+9}$
147	Lanthanum-140	$1 \times 10^{+1}$	$1 \times 10^{+5}$
148	Lead-203	$1 \times 10^{+2}$	$1 \times 10^{+6}$
149	Lead-210 <sup>1</sup>	$1 \times 10^{+1}$	$1 \times 10^{+4}$
150	Lead-212 <sup>1</sup>	$1 \times 10^{+1}$	$1 \times 10^{+5}$
151	Lutetium-172	$1 \times 10^{+1}$	$1 \times 10^{+4}$
152	Lutetium-177	$1 \times 10^{+3}$	$1 \times 10^{+7}$
153	Lutetium-178	$1 \times 10^{+1}$	$1 \times 10^{+4}$
154	Magnesium-28	$1 \times 10^{+1}$	$1 \times 10^{+5}$
155	Manganese-51	$1 \times 10^{+1}$	$1 \times 10^{+5}$
156	Manganese-53	$1 \times 10^{+4}$	$1 \times 10^{+9}$
157	Manganese-52m	$1 \times 10^{+1}$	$1 \times 10^{+5}$
158	Manganese-52	$1 \times 10^{+1}$	$1 \times 10^{+5}$
159	Manganese-56	$1 \times 10^{+1}$	$1 \times 10^{+5}$
160	Manganese-54	$1 \times 10^{+1}$	$1 \times 10^{+6}$
161	Mercury-195m	$1 \times 10^{+2}$	$1 \times 10^{+7}$
162	Mercury-197	$1 \times 10^{+2}$	$1 \times 10^{+6}$
163	Mercury-197m	$1 \times 10^{+2}$	$1 \times 10^{+6}$
164	Mercury-203	$1 \times 10^{+2}$	$1 \times 10^{+5}$
165	Molybdenum-101	$1 \times 10^{+1}$	$1 \times 10^{+6}$
166	Molybdenum-90	$1 \times 10^{+1}$	$1 \times 10^{+6}$

## SCHEDULE 1 (continued)

<b>Item</b>	<b>Column 1 Radionuclide</b>	<b>Column 2 Concentration (Bq/g)</b>	<b>Column 3 Activity (Bq)</b>
167	Molybdenum-93	$1 \times 10^{+3}$	$1 \times 10^{+8}$
168	Molybdenum-99 <sup>1</sup>	$1 \times 10^{+2}$	$1 \times 10^{+6}$
169	Neodymium-147	$1 \times 10^{+2}$	$1 \times 10^{+6}$
170	Neodymium-149	$1 \times 10^{+2}$	$1 \times 10^{+6}$
171	Neptunium-237 <sup>1</sup>	$1 \times 10^0$	$1 \times 10^{+3}$
172	Neptunium-239	$1 \times 10^{+2}$	$1 \times 10^{+7}$
173	Neptunium-240	$1 \times 10^{+1}$	$1 \times 10^{+6}$
174	Nickel-63	$1 \times 10^{+5}$	$1 \times 10^{+8}$
175	Nickel-59	$1 \times 10^{+4}$	$1 \times 10^{+8}$
176	Nickel-65	$1 \times 10^{+1}$	$1 \times 10^{+6}$
177	Niobium-93m	$1 \times 10^{+4}$	$1 \times 10^{+7}$
178	Niobium-94	$1 \times 10^{+1}$	$1 \times 10^{+6}$
179	Niobium-95	$1 \times 10^{+1}$	$1 \times 10^{+6}$
180	Niobium-97	$1 \times 10^{+1}$	$1 \times 10^{+6}$
181	Niobium-98	$1 \times 10^{+1}$	$1 \times 10^{+5}$
182	Nitrogen-13	$1 \times 10^{+2}$	$1 \times 10^{+9}$
183	Osmium-185	$1 \times 10^{+1}$	$1 \times 10^{+6}$
184	Osmium-191	$1 \times 10^{+2}$	$1 \times 10^{+7}$
185	Osmium-191m	$1 \times 10^{+3}$	$1 \times 10^{+7}$
186	Osmium-193	$1 \times 10^{+2}$	$1 \times 10^{+6}$
187	Oxygen-15	$1 \times 10^{+2}$	$1 \times 10^{+9}$
188	Palladium-103	$1 \times 10^{+3}$	$1 \times 10^{+8}$
189	Palladium-109	$1 \times 10^{+3}$	$1 \times 10^{+6}$
190	Phosphorus-32	$1 \times 10^{+3}$	$1 \times 10^{+5}$
191	Phosphorus-33	$1 \times 10^{+5}$	$1 \times 10^{+8}$
192	Platinum-191	$1 \times 10^{+2}$	$1 \times 10^{+6}$
193	Platinum-193m	$1 \times 10^{+3}$	$1 \times 10^{+7}$
194	Platinum-197	$1 \times 10^{+2}$	$1 \times 10^{+6}$
195	Platinum-197m	$1 \times 10^{+3}$	$1 \times 10^{+6}$
196	Plutonium-234	$1 \times 10^{+2}$	$1 \times 10^{+7}$
197	Plutonium-235	$1 \times 10^{+2}$	$1 \times 10^{+7}$
198	Plutonium-236	$1 \times 10^{+1}$	$1 \times 10^{+4}$
199	Plutonium-237	$1 \times 10^{+3}$	$1 \times 10^{+7}$
200	Plutonium-238	$1 \times 10^0$	$1 \times 10^{+4}$
201	Plutonium-239	$1 \times 10^0$	$1 \times 10^{+4}$



## SCHEDULE 1 (continued)

<b>Item</b>	<b>Column 1 Radionuclide</b>	<b>Column 2 Concentration (Bq/g)</b>	<b>Column 3 Activity (Bq)</b>
202	Plutonium-240	$1 \times 10^0$	$1 \times 10^{+3}$
203	Plutonium-241	$1 \times 10^{+2}$	$1 \times 10^{+5}$
204	Plutonium-242	$1 \times 10^0$	$1 \times 10^{+4}$
205	Plutonium-243	$1 \times 10^{+3}$	$1 \times 10^{+7}$
206	Plutonium-244	$1 \times 10^0$	$1 \times 10^{+4}$
207	Polonium-203	$1 \times 10^{+1}$	$1 \times 10^{+6}$
208	Polonium-205	$1 \times 10^{+1}$	$1 \times 10^{+6}$
209	Polonium-207	$1 \times 10^{+1}$	$1 \times 10^{+6}$
210	Polonium-210	$1 \times 10^{+1}$	$1 \times 10^{+4}$
211	Potassium-43	$1 \times 10^{+1}$	$1 \times 10^{+6}$
212	Potassium-42	$1 \times 10^{+2}$	$1 \times 10^{+6}$
213	Potassium-40	$1 \times 10^{+2}$	$1 \times 10^{+6}$
214	Praseodymium-142	$1 \times 10^{+2}$	$1 \times 10^{+5}$
215	Praseodymium-143	$1 \times 10^{+4}$	$1 \times 10^{+6}$
216	Promethium-145	$1 \times 10^{+1}$	$1 \times 10^{+4}$
217	Promethium-147	$1 \times 10^{+4}$	$1 \times 10^{+7}$
218	Promethium-149	$1 \times 10^{+3}$	$1 \times 10^{+6}$
219	Protactinium-230	$1 \times 10^{+1}$	$1 \times 10^{+6}$
220	Protactinium-231	$1 \times 10^0$	$1 \times 10^{+3}$
221	Protactinium-233	$1 \times 10^{+2}$	$1 \times 10^{+7}$
222	Radium-223 <sup>1</sup>	$1 \times 10^{+2}$	$1 \times 10^{+5}$
223	Radium-224 <sup>1</sup>	$1 \times 10^{+1}$	$1 \times 10^{+5}$
224	Radium-225	$1 \times 10^{+2}$	$1 \times 10^{+5}$
225	Radium-226 <sup>1</sup>	$1 \times 10^{+1}$	$1 \times 10^{+4}$
226	Radium-227	$1 \times 10^{+2}$	$1 \times 10^{+6}$
227	Radium-228 <sup>1</sup>	$1 \times 10^{+1}$	$1 \times 10^{+5}$
228	Radon-220 <sup>1</sup>	$1 \times 10^{+4}$	$1 \times 10^{+7}$
229	Radon-222 <sup>a</sup>	$1 \times 10^{+1}$	$1 \times 10^{+8}$
230	Rhenium-186	$1 \times 10^{+3}$	$1 \times 10^{+6}$
231	Rhenium-188	$1 \times 10^{+2}$	$1 \times 10^{+5}$
232	Rhodium-103m	$1 \times 10^{+4}$	$1 \times 10^{+8}$
233	Rhodium-105	$1 \times 10^{+2}$	$1 \times 10^{+7}$
234	Rubidium-81	$1 \times 10^{+1}$	$1 \times 10^{+6}$
235	Rubidium-82	$1 \times 10^{+1}$	$1 \times 10^{+4}$
236	Rubidium-83	$1 \times 10^{+1}$	$1 \times 10^{+4}$

## SCHEDULE 1 (continued)

<b>Item</b>	<b>Column 1 Radionuclide</b>	<b>Column 2 Concentration (Bq/g)</b>	<b>Column 3 Activity (Bq)</b>
237	Rubidium-86	$1 \times 10^{+2}$	$1 \times 10^{+5}$
238	Ruthenium-103	$1 \times 10^{+2}$	$1 \times 10^{+6}$
239	Ruthenium-105	$1 \times 10^{+1}$	$1 \times 10^{+6}$
240	Ruthenium-106 <sup>1</sup>	$1 \times 10^{+2}$	$1 \times 10^{+5}$
241	Ruthenium-97	$1 \times 10^{+2}$	$1 \times 10^{+7}$
242	Samarium-147	$1 \times 10^{+1}$	$1 \times 10^{+4}$
243	Samarium-151	$1 \times 10^{+4}$	$1 \times 10^{+8}$
244	Samarium-153	$1 \times 10^{+2}$	$1 \times 10^{+5}$
245	Scandium-44	$1 \times 10^{+1}$	$1 \times 10^{+4}$
246	Scandium-48	$1 \times 10^{+1}$	$1 \times 10^{+5}$
247	Scandium-46	$1 \times 10^{+1}$	$1 \times 10^{+6}$
248	Scandium-47	$1 \times 10^{+2}$	$1 \times 10^{+6}$
249	Selenium-72	$1 \times 10^{+1}$	$1 \times 10^{+4}$
250	Selenium-73	$1 \times 10^{+1}$	$1 \times 10^{+6}$
251	Selenium-75	$1 \times 10^{+2}$	$1 \times 10^{+6}$
252	Silicon-31	$1 \times 10^{+3}$	$1 \times 10^{+6}$
253	Silicon-32	$1 \times 10^{+1}$	$1 \times 10^{+4}$
254	Silver-105	$1 \times 10^{+2}$	$1 \times 10^{+6}$
255	Silver-109	$1 \times 10^{+1}$	$1 \times 10^{+4}$
256	Silver-110m	$1 \times 10^{+1}$	$1 \times 10^{+6}$
257	Silver-111	$1 \times 10^{+3}$	$1 \times 10^{+6}$
258	Sodium-22	$1 \times 10^{+1}$	$1 \times 10^{+6}$
259	Sodium-24	$1 \times 10^{+1}$	$1 \times 10^{+5}$
260	Strontium-82	$1 \times 10^{+1}$	$1 \times 10^{+4}$
261	Strontium-85	$1 \times 10^{+2}$	$1 \times 10^{+6}$
262	Strontium-85m	$1 \times 10^{+2}$	$1 \times 10^{+7}$
263	Strontium-87m	$1 \times 10^{+2}$	$1 \times 10^{+6}$
264	Strontium-89	$1 \times 10^{+3}$	$1 \times 10^{+5}$
265	Strontium-90	$1 \times 10^{+2}$	$1 \times 10^{+4}$
266	Strontium-91	$1 \times 10^{+1}$	$1 \times 10^{+5}$
267	Strontium-92	$1 \times 10^{+1}$	$1 \times 10^{+6}$
268	Sulphur-35	$1 \times 10^{+5}$	$1 \times 10^{+7}$
269	Tantalum-182	$1 \times 10^{+1}$	$1 \times 10^{+4}$
270	Technetium-95m	$1 \times 10^{+1}$	$1 \times 10^{+6}$
271	Technetium-96	$1 \times 10^{+1}$	$1 \times 10^{+6}$

## SCHEDULE 1 (continued)

<b>Item</b>	<b>Column 1 Radionuclide</b>	<b>Column 2 Concentration (Bq/g)</b>	<b>Column 3 Activity (Bq)</b>
272	Technetium-96m	$1 \times 10^{+3}$	$1 \times 10^{+7}$
273	Technetium-97	$1 \times 10^{+3}$	$1 \times 10^{+8}$
274	Technetium-97m	$1 \times 10^{+3}$	$1 \times 10^{+7}$
275	Technetium-99	$1 \times 10^{+4}$	$1 \times 10^{+7}$
276	Technetium-99m	$1 \times 10^{+2}$	$1 \times 10^{+7}$
277	Tellurium-123m	$1 \times 10^{+2}$	$1 \times 10^{+7}$
278	Tellurium-125m	$1 \times 10^{+3}$	$1 \times 10^{+7}$
279	Tellurium-127	$1 \times 10^{+3}$	$1 \times 10^{+6}$
280	Tellurium-127m	$1 \times 10^{+3}$	$1 \times 10^{+7}$
281	Tellurium-129	$1 \times 10^{+2}$	$1 \times 10^{+6}$
282	Tellurium-129m	$1 \times 10^{+3}$	$1 \times 10^{+6}$
283	Tellurium-131	$1 \times 10^{+2}$	$1 \times 10^{+5}$
284	Tellurium-131m	$1 \times 10^{+1}$	$1 \times 10^{+6}$
285	Tellurium-132	$1 \times 10^{+2}$	$1 \times 10^{+7}$
286	Tellurium-133	$1 \times 10^{+1}$	$1 \times 10^{+5}$
287	Tellurium-133m	$1 \times 10^{+1}$	$1 \times 10^{+5}$
288	Tellurium-134	$1 \times 10^{+1}$	$1 \times 10^{+6}$
289	Terbium-149	$1 \times 10^{+1}$	$1 \times 10^{+6}$
290	Terbium-160	$1 \times 10^{+1}$	$1 \times 10^{+6}$
291	Thallium-200	$1 \times 10^{+1}$	$1 \times 10^{+6}$
292	Thallium-201	$1 \times 10^{+2}$	$1 \times 10^{+6}$
293	Thallium-202	$1 \times 10^{+2}$	$1 \times 10^{+6}$
294	Thallium-204	$1 \times 10^{+4}$	$1 \times 10^{+4}$
295	Thorium-226 <sup>1</sup>	$1 \times 10^{+3}$	$1 \times 10^{+7}$
296	Thorium-227	$1 \times 10^{+1}$	$1 \times 10^{+4}$
297	Thorium-228 <sup>1</sup>	$1 \times 10^0$	$1 \times 10^{+4}$
298	Thorium-229 <sup>1</sup>	$1 \times 10^0$	$1 \times 10^{+3}$
299	Thorium-230	$1 \times 10^0$	$1 \times 10^{+4}$
300	Thorium-231	$1 \times 10^{+3}$	$1 \times 10^{+7}$
301	Thorium-234	$1 \times 10^{+3}$	$1 \times 10^{+5}$
302	Thorium-nat <sup>1</sup>	$1 \times 10^0$	$1 \times 10^{+3}$
303	Thulium-170	$1 \times 10^{+3}$	$1 \times 10^{+6}$
304	Thulium-171	$1 \times 10^{+4}$	$1 \times 10^{+8}$
305	Tin-113	$1 \times 10^{+3}$	$1 \times 10^{+7}$
306	Tin-117m	$1 \times 10^{+2}$	$1 \times 10^{+6}$

## SCHEDULE 1 (continued)

<b>Item</b>	<b>Column 1 Radionuclide</b>	<b>Column 2 Concentration (Bq/g)</b>	<b>Column 3 Activity (Bq)</b>
307	Tin-121	$1 \times 10^{+5}$	$1 \times 10^{+7}$
308	Tin-125	$1 \times 10^{+2}$	$1 \times 10^{+5}$
309	Titanium-44	$1 \times 10^{+1}$	$1 \times 10^{+4}$
310	Tungsten-181	$1 \times 10^{+3}$	$1 \times 10^{+7}$
311	Tungsten-185	$1 \times 10^{+4}$	$1 \times 10^{+7}$
312	Tungsten-187	$1 \times 10^{+2}$	$1 \times 10^{+6}$
313	Tungsten-188	$1 \times 10^{+2}$	$1 \times 10^{+5}$
314	Uranium-240 <sup>1</sup>	$1 \times 10^{+1}$	$1 \times 10^{+6}$
315	Uranium-230 <sup>1</sup>	$1 \times 10^{+1}$	$1 \times 10^{+5}$
316	Uranium-231	$1 \times 10^{+2}$	$1 \times 10^{+7}$
317	Uranium-232 <sup>1</sup>	$1 \times 10^0$	$1 \times 10^{+3}$
318	Uranium-233	$1 \times 10^{+1}$	$1 \times 10^{+4}$
319	Uranium-234	$1 \times 10^{+1}$	$1 \times 10^{+4}$
320	Uranium-235 <sup>1</sup>	$1 \times 10^{+1}$	$1 \times 10^{+4}$
321	Uranium-236	$1 \times 10^{+1}$	$1 \times 10^{+4}$
322	Uranium-237	$1 \times 10^{+2}$	$1 \times 10^{+6}$
323	Uranium-238 <sup>1</sup>	$1 \times 10^{+1}$	$1 \times 10^{+4}$
324	Uranium-239	$1 \times 10^{+2}$	$1 \times 10^{+6}$
325	Uranium-240	$1 \times 10^{+3}$	$1 \times 10^{+7}$
326	Uranium-nat <sup>1</sup>	$1 \times 10^0$	$1 \times 10^{+3}$
327	Vanadium-48	$1 \times 10^{+1}$	$1 \times 10^{+5}$
328	Xenon-127	$1 \times 10^{+1}$	$1 \times 10^{+4}$
329	Xenon-131m	$1 \times 10^{+4}$	$1 \times 10^{+4}$
330	Xenon-133	$1 \times 10^{+3}$	$1 \times 10^{+4}$
331	Xenon-135	$1 \times 10^{+3}$	$1 \times 10^{+10}$
332	Ytterbium-169	$1 \times 10^{+2}$	$1 \times 10^{+7}$
333	Ytterbium-175	$1 \times 10^{+3}$	$1 \times 10^{+7}$
334	Yttrium-88	$1 \times 10^{+1}$	$1 \times 10^{+4}$
335	Yttrium-90	$1 \times 10^{+3}$	$1 \times 10^{+5}$
336	Yttrium-91	$1 \times 10^{+3}$	$1 \times 10^{+6}$
337	Yttrium-91m	$1 \times 10^{+2}$	$1 \times 10^{+6}$
338	Yttrium-92	$1 \times 10^{+2}$	$1 \times 10^{+5}$
339	Yttrium-93	$1 \times 10^{+2}$	$1 \times 10^{+5}$
340	Zinc-69m	$1 \times 10^{+2}$	$1 \times 10^{+6}$
341	Zinc-65	$1 \times 10^{+1}$	$1 \times 10^{+6}$

## SCHEDULE 1 (continued)

<b>Item</b>	<b>Column 1 Radionuclide</b>	<b>Column 2 Concentration (Bq/g)</b>	<b>Column 3 Activity (Bq)</b>
342	Zinc-69	$1 \times 10^{+4}$	$1 \times 10^{+6}$
343	Zirconium-88	$1 \times 10^{+1}$	$1 \times 10^{+4}$
344	Zirconium-93 <sup>1</sup>	$1 \times 10^{+3}$	$1 \times 10^{+7}$
345	Zirconium-95	$1 \times 10^{+1}$	$1 \times 10^{+6}$
346	Zirconium-97 <sup>1</sup>	$1 \times 10^{+1}$	$1 \times 10^{+5}$
347	alpha-emitting radionuclide not mentioned in another item	$1 \times 10^0$	$1 \times 10^{+3}$
348	radionuclide that is not alpha-emitting and not mentioned in another item	$1 \times 10^{+1}$	$1 \times 10^{+4}$

1. The superscript <sup>1</sup> immediately following an item in column 1 indicates that the item's concentration and activity are the concentration and activity of the parent radionuclide and its progeny when in secular equilibrium.

## SCHEDULE 2

### DISPOSAL OF RADIOACTIVE MATERIAL—RADIONUCLIDE CONCENTRATIONS

sections 10 and 11

Item	Column 1 Radionuclide	Column 2 Release to air concentration (Bq/m <sup>3</sup> )	Column 3 Release to water concentration (Bq/m <sup>3</sup> )	Column 4 Release to sewerage system concentration (Bq/m <sup>3</sup> )
1	Actinium-225	3.77 x 10 <sup>-3</sup>	2.85 x 10 <sup>+4</sup>	5.71 x 10 <sup>+4</sup>
2	Actinium-227	4.73 x 10 <sup>-5</sup>	6.23 x 10 <sup>+2</sup>	1.25 x 10 <sup>+3</sup>
3	Actinium-228	1.03 x 10 <sup>0</sup>	1.59 x 10 <sup>+6</sup>	3.19 x 10 <sup>+6</sup>
4	Aluminium-26	1.65 x 10 <sup>0</sup>	1.96 x 10 <sup>+5</sup>	3.91 x 10 <sup>+5</sup>
5	Americium-241	7.64 x 10 <sup>-4</sup>	3.42 x 10 <sup>+3</sup>	6.85 x 10 <sup>+3</sup>
6	Americium-242	1.86 x 10 <sup>0</sup>	2.28 x 10 <sup>+6</sup>	4.57 x 10 <sup>+6</sup>
7	Americium-242m <sup>1</sup>	8.51 x 10 <sup>-4</sup>	3.60 x 10 <sup>+3</sup>	7.21 x 10 <sup>+3</sup>
8	Americium-243 <sup>1</sup>	7.64 x 10 <sup>-4</sup>	3.42 x 10 <sup>+3</sup>	6.85 x 10 <sup>+3</sup>
9	Antimony-122	2.48 x 10 <sup>+1</sup>	4.03 x 10 <sup>+5</sup>	8.06 x 10 <sup>+5</sup>
10	Antimony-124	4.88 x 10 <sup>0</sup>	2.74 x 10 <sup>+5</sup>	5.48 x 10 <sup>+5</sup>
11	Antimony-125	6.62 x 10 <sup>0</sup>	6.23 x 10 <sup>+5</sup>	1.25 x 10 <sup>+6</sup>
12	Argon-37 <sup>1</sup>	3.34 x 10 <sup>+8</sup>	-	-
13	Argon-41 <sup>1</sup>	2.58 x 10 <sup>+2</sup>	-	-
14	Arsenic-72	2.29 x 10 <sup>+1</sup>	3.81 x 10 <sup>+5</sup>	7.61 x 10 <sup>+5</sup>
15	Arsenic-73	3.20 x 10 <sup>+1</sup>	2.63 x 10 <sup>+6</sup>	5.27 x 10 <sup>+6</sup>
16	Arsenic-74	1.42 x 10 <sup>+1</sup>	5.27 x 10 <sup>+5</sup>	1.05 x 10 <sup>+6</sup>
17	Arsenic-76	3.24 x 10 <sup>+1</sup>	4.28 x 10 <sup>+5</sup>	8.56 x 10 <sup>+5</sup>
18	Arsenic-77	7.09 x 10 <sup>+1</sup>	1.71 x 10 <sup>+6</sup>	3.42 x 10 <sup>+6</sup>
19	Astatine-211	2.71 x 10 <sup>-1</sup>	6.23 x 10 <sup>+4</sup>	1.25 x 10 <sup>+5</sup>
20	Barium-128	2.29 x 10 <sup>+1</sup>	2.54 x 10 <sup>+5</sup>	5.07 x 10 <sup>+5</sup>
21	Barium-131	8.51 x 10 <sup>+1</sup>	1.52 x 10 <sup>+6</sup>	3.04 x 10 <sup>+6</sup>
22	Barium-133	1.65 x 10 <sup>+1</sup>	6.85 x 10 <sup>+5</sup>	1.37 x 10 <sup>+6</sup>
23	Barium-140 <sup>1</sup>	1.86 x 10 <sup>+1</sup>	2.74 x 10 <sup>+5</sup>	5.48 x 10 <sup>+5</sup>
24	Berkelium-249	1.99 x 10 <sup>-1</sup>	7.06 x 10 <sup>+5</sup>	1.41 x 10 <sup>+6</sup>

## SCHEDULE 2 (continued)

<b>Item</b>	<b>Column 1 Radionuclide</b>	<b>Column 2 Release to air concentration (Bq/m<sup>3</sup>)</b>	<b>Column 3 Release to water concentration (Bq/m<sup>3</sup>)</b>	<b>Column 4 Release to sewerage system concentration (Bq/m<sup>3</sup>)</b>
25	Beryllium-7	5.73 x 10 <sup>+2</sup>	2.45 x 10 <sup>+7</sup>	4.89 x 10 <sup>+7</sup>
26	Bismuth-206	1.42 x 10 <sup>+1</sup>	3.60 x 10 <sup>+5</sup>	7.21 x 10 <sup>+5</sup>
27	Bismuth-207	5.73 x 10 <sup>0</sup>	5.27 x 10 <sup>+5</sup>	1.05 x 10 <sup>+6</sup>
28	Bismuth-210	3.55 x 10 <sup>-1</sup>	5.27 x 10 <sup>+5</sup>	1.05 x 10 <sup>+6</sup>
29	Bismuth-212 <sup>1</sup>	7.64 x 10 <sup>-1</sup>	2.63 x 10 <sup>+6</sup>	5.27 x 10 <sup>+6</sup>
30	Bismuth-213	7.26 x 10 <sup>-1</sup>	3.42 x 10 <sup>+6</sup>	6.85 x 10 <sup>+6</sup>
31	Bromine-75	3.50 x 10 <sup>+2</sup>	8.67 x 10 <sup>+6</sup>	1.73 x 10 <sup>+7</sup>
32	Bromine-76	5.13 x 10 <sup>+1</sup>	1.49 x 10 <sup>+6</sup>	2.98 x 10 <sup>+6</sup>
33	Bromine-77	2.29 x 10 <sup>+2</sup>	7.13 x 10 <sup>+6</sup>	1.43 x 10 <sup>+7</sup>
34	Bromine-82	3.38 x 10 <sup>+1</sup>	1.27 x 10 <sup>+6</sup>	2.54 x 10 <sup>+6</sup>
35	Cadmium-109	3.10 x 10 <sup>0</sup>	3.42 x 10 <sup>+5</sup>	6.85 x 10 <sup>+5</sup>
36	Cadmium-115	2.29 x 10 <sup>+1</sup>	4.89 x 10 <sup>+5</sup>	9.78 x 10 <sup>+5</sup>
37	Cadmium-115m	4.08 x 10 <sup>0</sup>	2.08 x 10 <sup>+5</sup>	4.15 x 10 <sup>+5</sup>
38	Caesium-129	3.68 x 10 <sup>+2</sup>	1.14 x 10 <sup>+7</sup>	2.28 x 10 <sup>+7</sup>
39	Caesium-131	6.62 x 10 <sup>+2</sup>	1.18 x 10 <sup>+7</sup>	2.36 x 10 <sup>+7</sup>
40	Caesium-132	7.84 x 10 <sup>+1</sup>	1.37 x 10 <sup>+6</sup>	2.74 x 10 <sup>+6</sup>
41	Caesium-134	3.10 x 10 <sup>0</sup>	3.60 x 10 <sup>+4</sup>	7.21 x 10 <sup>+4</sup>
42	Caesium-134m	1.15 x 10 <sup>+3</sup>	3.42 x 10 <sup>+7</sup>	6.85 x 10 <sup>+7</sup>
43	Caesium-135	3.01 x 10 <sup>+1</sup>	3.42 x 10 <sup>+5</sup>	6.85 x 10 <sup>+5</sup>
44	Caesium-136	1.57 x 10 <sup>+1</sup>	2.28 x 10 <sup>+5</sup>	4.57 x 10 <sup>+5</sup>
45	Caesium-137 <sup>1</sup>	4.44 x 10 <sup>0</sup>	5.27 x 10 <sup>+4</sup>	1.05 x 10 <sup>+5</sup>
46	Caesium-138	6.47 x 10 <sup>+2</sup>	7.44 x 10 <sup>+6</sup>	1.49 x 10 <sup>+7</sup>
47	Calcium-45	1.10 x 10 <sup>+1</sup>	9.01 x 10 <sup>+5</sup>	1.80 x 10 <sup>+6</sup>
48	Calcium-47	1.42 x 10 <sup>+1</sup>	4.28 x 10 <sup>+5</sup>	8.56 x 10 <sup>+5</sup>
49	Californium-246	7.09 x 10 <sup>-2</sup>	2.08 x 10 <sup>+5</sup>	4.15 x 10 <sup>+5</sup>
50	Californium-248	3.63 x 10 <sup>-3</sup>	2.45 x 10 <sup>+4</sup>	4.89 x 10 <sup>+4</sup>
51	Californium-249	4.51 x 10 <sup>-4</sup>	1.96 x 10 <sup>+3</sup>	3.91 x 10 <sup>+3</sup>
52	Californium-250	9.31 x 10 <sup>-4</sup>	4.28 x 10 <sup>+3</sup>	8.56 x 10 <sup>+3</sup>
53	Californium-251	4.44 x 10 <sup>-4</sup>	1.90 x 10 <sup>+3</sup>	3.81 x 10 <sup>+3</sup>
54	Californium-252	1.65 x 10 <sup>-3</sup>	7.61 x 10 <sup>+3</sup>	1.52 x 10 <sup>+4</sup>
55	Californium-253	2.48 x 10 <sup>-2</sup>	4.89 x 10 <sup>+5</sup>	9.78 x 10 <sup>+5</sup>
56	Californium-254	8.05 x 10 <sup>-4</sup>	1.71 x 10 <sup>+3</sup>	3.42 x 10 <sup>+3</sup>

## SCHEDULE 2 (continued)

<b>Item</b>	<b>Column 1 Radionuclide</b>	<b>Column 2 Release to air concentration (Bq/m<sup>3</sup>)</b>	<b>Column 3 Release to water concentration (Bq/m<sup>3</sup>)</b>	<b>Column 4 Release to sewerage system concentration (Bq/m<sup>3</sup>)</b>
57	Carbon-11	9.31 x 10 <sup>+3</sup>	2.85 x 10 <sup>+7</sup>	5.71 x 10 <sup>+7</sup>
58	Carbon-14	5.13 x 10 <sup>+1</sup>	1.18 x 10 <sup>+6</sup>	2.36 x 10 <sup>+6</sup>
59	Cerium-139	1.65 x 10 <sup>+1</sup>	2.63 x 10 <sup>+6</sup>	5.27 x 10 <sup>+6</sup>
60	Cerium-141	8.27 x 10 <sup>0</sup>	9.65 x 10 <sup>+5</sup>	1.93 x 10 <sup>+6</sup>
61	Cerium-143	2.98 x 10 <sup>+1</sup>	6.23 x 10 <sup>+5</sup>	1.25 x 10 <sup>+6</sup>
62	Cerium-144 <sup>1</sup>	6.08 x 10 <sup>-1</sup>	1.32 x 10 <sup>+5</sup>	2.63 x 10 <sup>+5</sup>
63	Chlorine-36	4.32 x 10 <sup>0</sup>	7.36 x 10 <sup>+5</sup>	1.47 x 10 <sup>+6</sup>
64	Chlorine-38	4.08 x 10 <sup>+2</sup>	5.71 x 10 <sup>+6</sup>	1.14 x 10 <sup>+7</sup>
65	Chromium-51	8.27 x 10 <sup>+2</sup>	1.80 x 10 <sup>+7</sup>	3.60 x 10 <sup>+7</sup>
66	Cobalt-55	3.59 x 10 <sup>+1</sup>	6.23 x 10 <sup>+5</sup>	1.25 x 10 <sup>+6</sup>
67	Cobalt-56	4.73 x 10 <sup>0</sup>	2.74 x 10 <sup>+5</sup>	5.48 x 10 <sup>+5</sup>
68	Cobalt-57	3.17 x 10 <sup>+1</sup>	3.26 x 10 <sup>+6</sup>	6.52 x 10 <sup>+6</sup>
69	Cobalt-58	1.49 x 10 <sup>+1</sup>	9.26 x 10 <sup>+5</sup>	1.85 x 10 <sup>+6</sup>
70	Cobalt-58m	1.75 x 10 <sup>+3</sup>	2.85 x 10 <sup>+7</sup>	5.71 x 10 <sup>+7</sup>
71	Cobalt-60	1.03 x 10 <sup>0</sup>	2.01 x 10 <sup>+5</sup>	4.03 x 10 <sup>+5</sup>
72	Cobalt-60m	2.29 x 10 <sup>+4</sup>	4.03 x 10 <sup>+8</sup>	8.06 x 10 <sup>+8</sup>
73	Cobalt-61	3.97 x 10 <sup>+2</sup>	9.26 x 10 <sup>+6</sup>	1.85 x 10 <sup>+7</sup>
74	Cobalt-62m	8.05 x 10 <sup>+2</sup>	1.46 x 10 <sup>+7</sup>	2.91 x 10 <sup>+7</sup>
75	Copper-64	1.99 x 10 <sup>+2</sup>	5.71 x 10 <sup>+6</sup>	1.14 x 10 <sup>+7</sup>
76	Copper-67	5.13 x 10 <sup>+1</sup>	2.01 x 10 <sup>+6</sup>	4.03 x 10 <sup>+6</sup>
77	Curium-242	6.20 x 10 <sup>-3</sup>	5.71 x 10 <sup>+4</sup>	1.14 x 10 <sup>+5</sup>
78	Curium-243	1.03 x 10 <sup>-3</sup>	4.57 x 10 <sup>+3</sup>	9.13 x 10 <sup>+3</sup>
79	Curium-244	1.19 x 10 <sup>-3</sup>	5.71 x 10 <sup>+3</sup>	1.14 x 10 <sup>+4</sup>
80	Curium-245	7.44 x 10 <sup>-4</sup>	3.26 x 10 <sup>+3</sup>	6.52 x 10 <sup>+3</sup>
81	Curium-246	7.44 x 10 <sup>-4</sup>	3.26 x 10 <sup>+3</sup>	6.52 x 10 <sup>+3</sup>
82	Curium-247	8.27 x 10 <sup>-4</sup>	3.60 x 10 <sup>+3</sup>	7.21 x 10 <sup>+3</sup>
83	Curium-248	2.13 x 10 <sup>-4</sup>	8.90 x 10 <sup>+2</sup>	1.78 x 10 <sup>+3</sup>
84	Dysprosium-165	3.42 x 10 <sup>+2</sup>	6.23 x 10 <sup>+6</sup>	1.25 x 10 <sup>+7</sup>
85	Dysprosium-166	1.65 x 10 <sup>+1</sup>	4.28 x 10 <sup>+5</sup>	8.56 x 10 <sup>+5</sup>
86	Einsteinium-253	1.19 x 10 <sup>-2</sup>	1.12 x 10 <sup>+5</sup>	2.25 x 10 <sup>+5</sup>
87	Einsteinium-254	3.72 x 10 <sup>-3</sup>	2.45 x 10 <sup>+4</sup>	4.89 x 10 <sup>+4</sup>
88	Einsteinium-254m	6.77 x 10 <sup>-2</sup>	1.63 x 10 <sup>+5</sup>	3.26 x 10 <sup>+5</sup>



## SCHEDULE 2 (continued)

<b>Item</b>	<b>Column 1 Radionuclide</b>	<b>Column 2 Release to air concentration (Bq/m<sup>3</sup>)</b>	<b>Column 3 Release to water concentration (Bq/m<sup>3</sup>)</b>	<b>Column 4 Release to sewerage system concentration (Bq/m<sup>3</sup>)</b>
89	Erbium-161	3.50 x 10 <sup>+2</sup>	8.56 x 10 <sup>+6</sup>	1.71 x 10 <sup>+7</sup>
90	Erbium-169	3.04 x 10 <sup>+1</sup>	1.85 x 10 <sup>+6</sup>	3.70 x 10 <sup>+6</sup>
91	Erbium-171	9.93 x 10 <sup>+1</sup>	1.90 x 10 <sup>+6</sup>	3.81 x 10 <sup>+6</sup>
92	Europium-152	7.64 x 10 <sup>-1</sup>	4.89 x 10 <sup>+5</sup>	9.78 x 10 <sup>+5</sup>
93	Europium-152m	9.31 x 10 <sup>+1</sup>	1.37 x 10 <sup>+6</sup>	2.74 x 10 <sup>+6</sup>
94	Europium-154	5.96 x 10 <sup>-1</sup>	3.42 x 10 <sup>+5</sup>	6.85 x 10 <sup>+5</sup>
95	Europium-155	4.58 x 10 <sup>0</sup>	2.14 x 10 <sup>+6</sup>	4.28 x 10 <sup>+6</sup>
96	Fermium-254	3.87 x 10 <sup>-1</sup>	1.56 x 10 <sup>+6</sup>	3.11 x 10 <sup>+6</sup>
97	Fermium-255	1.15 x 10 <sup>-1</sup>	2.74 x 10 <sup>+5</sup>	5.48 x 10 <sup>+5</sup>
98	Fluorine-18	3.20 x 10 <sup>+2</sup>	1.4 x 10 <sup>+7</sup>	2.8 x 10 <sup>+7</sup>
99	Gadolinium-146	4.96 x 10 <sup>0</sup>	7.13 x 10 <sup>+5</sup>	1.43 x 10 <sup>+6</sup>
100	Gadolinium-148	9.93 x 10 <sup>+4</sup>	1.25 x 10 <sup>+4</sup>	2.49 x 10 <sup>+4</sup>
101	Gadolinium-153	1.19 x 10 <sup>+1</sup>	2.54 x 10 <sup>+6</sup>	5.07 x 10 <sup>+6</sup>
102	Gadolinium-159	7.64 x 10 <sup>+1</sup>	1.40 x 10 <sup>+6</sup>	2.80 x 10 <sup>+6</sup>
103	Gallium-67	1.06 x 10 <sup>+2</sup>	3.60 x 10 <sup>+6</sup>	7.21 x 10 <sup>+6</sup>
104	Gallium-72	3.55 x 10 <sup>+1</sup>	6.23 x 10 <sup>+5</sup>	1.25 x 10 <sup>+6</sup>
105	Germanium-68	2.29 x 10 <sup>0</sup>	5.27 x 10 <sup>+5</sup>	1.05 x 10 <sup>+6</sup>
106	Germanium-71	2.71 x 10 <sup>+3</sup>	5.71 x 10 <sup>+7</sup>	1.14 x 10 <sup>+8</sup>
107	Gold-198	2.71 x 10 <sup>+1</sup>	6.85 x 10 <sup>+5</sup>	1.37 x 10 <sup>+6</sup>
108	Gold-199	3.92 x 10 <sup>+1</sup>	1.56 x 10 <sup>+6</sup>	3.11 x 10 <sup>+6</sup>
109	Hafnium-172	8.05 x 10 <sup>+1</sup>	6.85 x 10 <sup>+5</sup>	1.37 x 10 <sup>+6</sup>
110	Hafnium-181	6.34 x 10 <sup>0</sup>	6.23 x 10 <sup>+5</sup>	1.25 x 10 <sup>+6</sup>
111	Holmium-166	3.59 x 10 <sup>+1</sup>	4.89 x 10 <sup>+5</sup>	9.78 x 10 <sup>+5</sup>
112	Hydrogen-3	1.65 x 10 <sup>+7</sup>	3.81 x 10 <sup>+7</sup>	7.61 x 10 <sup>+7</sup>
113	Indium-111	9.61 x 10 <sup>+1</sup>	2.36 x 10 <sup>+6</sup>	4.72 x 10 <sup>+6</sup>
114	Indium-113m	9.31 x 10 <sup>+2</sup>	2.45 x 10 <sup>+7</sup>	4.89 x 10 <sup>+7</sup>
115	Indium-114m	2.71 x 10 <sup>0</sup>	1.67 x 10 <sup>+5</sup>	3.34 x 10 <sup>+5</sup>
116	Indium-115m	3.42 x 10 <sup>+2</sup>	7.96 x 10 <sup>+6</sup>	1.59 x 10 <sup>+7</sup>
117	Iodine-123	2.71 x 10 <sup>+2</sup>	3.26 x 10 <sup>+6</sup>	6.52 x 10 <sup>+6</sup>
118	Iodine-124	4.73 x 10 <sup>0</sup>	5.27 x 10 <sup>+4</sup>	1.05 x 10 <sup>+5</sup>
119	Iodine-125	4.08 x 10 <sup>0</sup>	4.57 x 10 <sup>+4</sup>	9.13 x 10 <sup>+4</sup>
120	Iodine-126	2.13 x 10 <sup>0</sup>	2.36 x 10 <sup>+4</sup>	4.72 x 10 <sup>+4</sup>

## SCHEDULE 2 (continued)

<b>Item</b>	<b>Column 1 Radionuclide</b>	<b>Column 2 Release to air concentration (Bq/m<sup>3</sup>)</b>	<b>Column 3 Release to water concentration (Bq/m<sup>3</sup>)</b>	<b>Column 4 Release to sewerage system concentration (Bq/m<sup>3</sup>)</b>
121	Iodine-129	5.84 x 10 <sup>-1</sup>	6.23 x 10 <sup>+3</sup>	1.25 x 10 <sup>+4</sup>
122	Iodine-130	3.10 x 10 <sup>+1</sup>	3.42 x 10 <sup>+5</sup>	6.85 x 10 <sup>+5</sup>
123	Iodine-131	2.71 x 10 <sup>0</sup>	3.11 x 10 <sup>+4</sup>	6.23 x 10 <sup>+4</sup>
124	Iodine-132	1.49 x 10 <sup>+2</sup>	2.36 x 10 <sup>+6</sup>	4.72 x 10 <sup>+6</sup>
125	Iodine-133	1.42 x 10 <sup>+1</sup>	1.59 x 10 <sup>+5</sup>	3.19 x 10 <sup>+5</sup>
126	Iodine-134	3.77 x 10 <sup>+2</sup>	6.23 x 10 <sup>+6</sup>	1.25 x 10 <sup>+7</sup>
127	Iodine-135	6.47 x 10 <sup>+1</sup>	7.36 x 10 <sup>+5</sup>	1.47 x 10 <sup>+6</sup>
128	Iridium-190	1.19 x 10 <sup>+1</sup>	5.71 x 10 <sup>+5</sup>	1.14 x 10 <sup>+6</sup>
129	Iridium-192	4.80 x 10 <sup>0</sup>	4.89 x 10 <sup>+5</sup>	9.78 x 10 <sup>+5</sup>
130	Iridium-194	3.97 x 10 <sup>+1</sup>	5.27 x 10 <sup>+5</sup>	1.05 x 10 <sup>+6</sup>
131	Iron-52	3.13 x 10 <sup>+1</sup>	4.89 x 10 <sup>+5</sup>	9.78 x 10 <sup>+5</sup>
132	Iron-55	3.24 x 10 <sup>+1</sup>	2.08 x 10 <sup>+6</sup>	4.15 x 10 <sup>+6</sup>
133	Iron-59	8.51 x 10 <sup>0</sup>	3.81 x 10 <sup>+5</sup>	7.61 x 10 <sup>+5</sup>
134	Krypton-74 <sup>1</sup>	-	-	-
135	Krypton-76 <sup>1</sup>	8.56 x 10 <sup>+2</sup>	-	-
136	Krypton-77 <sup>1</sup>	3.51 x 10 <sup>+2</sup>	-	-
137	Krypton-79 <sup>1</sup>	1.41 x 10 <sup>+3</sup>	-	-
138	Krypton-81 <sup>1</sup>	6.52 x 10 <sup>+4</sup>	-	-
139	Krypton-83m <sup>1</sup>	6.52 x 10 <sup>+6</sup>	-	-
140	Krypton-85 <sup>1</sup>	6.23 x 10 <sup>+4</sup>	-	-
141	Krypton-85m <sup>1</sup>	2.32 x 10 <sup>+3</sup>	-	-
142	Krypton-87 <sup>1</sup>	4.03 x 10 <sup>+2</sup>	-	-
143	Krypton-88 <sup>1</sup>	1.63 x 10 <sup>+2</sup>	-	-
144	Lanthanum-140	1.99 x 10 <sup>+1</sup>	3.42 x 10 <sup>+5</sup>	6.85 x 10 <sup>+5</sup>
145	Lead-203	1.86 x 10 <sup>+2</sup>	2.85 x 10 <sup>+6</sup>	5.71 x 10 <sup>+6</sup>
146	Lead-210	2.71 x 10 <sup>-2</sup>	1.01 x 10 <sup>+3</sup>	2.01 x 10 <sup>+3</sup>
147	Lead-212	9.02 x 10 <sup>-1</sup>	1.16 x 10 <sup>+5</sup>	2.32 x 10 <sup>+5</sup>
148	Lutetium-172	1.65 x 10 <sup>+1</sup>	5.27 x 10 <sup>+5</sup>	1.05 x 10 <sup>+6</sup>
149	Lutetium-178	7.26 x 10 <sup>+2</sup>	1.46 x 10 <sup>+7</sup>	2.91 x 10 <sup>+7</sup>
150	Lutetium-177	2.71 x 10 <sup>+1</sup>	1.29 x 10 <sup>+6</sup>	2.58 x 10 <sup>+6</sup>
151	Magnesium-28	1.75 x 10 <sup>+1</sup>	3.11 x 10 <sup>+5</sup>	6.23 x 10 <sup>+5</sup>
152	Manganese-51	4.38 x 10 <sup>+2</sup>	7.36 x 10 <sup>+6</sup>	1.47 x 10 <sup>+7</sup>

## SCHEDULE 2 (continued)

<b>Item</b>	<b>Column 1 Radionuclide</b>	<b>Column 2 Release to air concentration (Bq/m<sup>3</sup>)</b>	<b>Column 3 Release to water concentration (Bq/m<sup>3</sup>)</b>	<b>Column 4 Release to sewerage system concentration (Bq/m<sup>3</sup>)</b>
153	Manganese-52	1.65 x 10 <sup>+1</sup>	3.81 x 10 <sup>+5</sup>	7.61 x 10 <sup>+5</sup>
154	Manganese-52m	5.96 x 10 <sup>+2</sup>	9.93 x 10 <sup>+6</sup>	1.99 x 10 <sup>+7</sup>
155	Manganese-53	5.73 x 10 <sup>+2</sup>	2.28 x 10 <sup>+7</sup>	4.57 x 10 <sup>+7</sup>
156	Manganese-54	1.99 x 10 <sup>+1</sup>	9.65 x 10 <sup>+5</sup>	1.93 x 10 <sup>+6</sup>
157	Manganese-56	1.49 x 10 <sup>+2</sup>	2.74 x 10 <sup>+6</sup>	5.48 x 10 <sup>+6</sup>
158	Mercury-195m	4.58 x 10 <sup>+1</sup>	1.22 x 10 <sup>+6</sup>	2.45 x 10 <sup>+6</sup>
159	Mercury-197	1.03 x 10 <sup>+2</sup>	2.98 x 10 <sup>+6</sup>	5.96 x 10 <sup>+6</sup>
160	Mercury-197m	4.51 x 10 <sup>+1</sup>	1.46 x 10 <sup>+6</sup>	2.91 x 10 <sup>+6</sup>
161	Mercury-203	1.29 x 10 <sup>+1</sup>	3.60 x 10 <sup>+5</sup>	7.21 x 10 <sup>+5</sup>
162	Molybdenum-101	6.62 x 10 <sup>+2</sup>	1.63 x 10 <sup>+7</sup>	3.26 x 10 <sup>+7</sup>
163	Molybdenum-90	5.32 x 10 <sup>+1</sup>	1.10 x 10 <sup>+6</sup>	2.21 x 10 <sup>+6</sup>
164	Molybdenum-93	1.35 x 10 <sup>+1</sup>	2.63 x 10 <sup>+5</sup>	5.27 x 10 <sup>+5</sup>
165	Molybdenum-99 <sup>1</sup>	2.71 x 10 <sup>+1</sup>	5.71 x 10 <sup>+5</sup>	1.14 x 10 <sup>+6</sup>
166	Neodymium-147	1.29 x 10 <sup>+1</sup>	6.23 x 10 <sup>+5</sup>	1.25 x 10 <sup>+6</sup>
167	Neodymium-149	2.29 x 10 <sup>+2</sup>	5.71 x 10 <sup>+6</sup>	1.14 x 10 <sup>+7</sup>
168	Neptunium-237 <sup>1</sup>	1.42 x 10 <sup>-3</sup>	6.23 x 10 <sup>+3</sup>	1.25 x 10 <sup>+4</sup>
169	Neptunium-239	2.71 x 10 <sup>+1</sup>	8.56 x 10 <sup>+5</sup>	1.71 x 10 <sup>+6</sup>
170	Neptunium-240	2.29 x 10 <sup>+2</sup>	8.35 x 10 <sup>+6</sup>	1.67 x 10 <sup>+7</sup>
171	Nickel-59	1.35 x 10 <sup>+2</sup>	1.09 x 10 <sup>+7</sup>	2.17 x 10 <sup>+7</sup>
172	Nickel-63	5.73 x 10 <sup>+1</sup>	4.57 x 10 <sup>+6</sup>	9.13 x 10 <sup>+6</sup>
173	Nickel-65	2.29 x 10 <sup>+2</sup>	3.81 x 10 <sup>+6</sup>	7.61 x 10 <sup>+6</sup>
174	Niobium-93m	3.46 x 10 <sup>+1</sup>	5.71 x 10 <sup>+6</sup>	1.14 x 10 <sup>+7</sup>
175	Niobium-94	6.62 x 10 <sup>-1</sup>	4.03 x 10 <sup>+5</sup>	8.06 x 10 <sup>+5</sup>
176	Niobium-95	1.86 x 10 <sup>+1</sup>	1.18 x 10 <sup>+6</sup>	2.36 x 10 <sup>+6</sup>
177	Niobium-97	4.14 x 10 <sup>+2</sup>	1.01 x 10 <sup>+7</sup>	2.01 x 10 <sup>+7</sup>
178	Niobium-98	3.01 x 10 <sup>+2</sup>	6.23 x 10 <sup>+6</sup>	1.25 x 10 <sup>+7</sup>
179	Nitrogen-13 <sup>1</sup>	-	-	-
180	Osmium-185	1.99 x 10 <sup>+1</sup>	1.34 x 10 <sup>+6</sup>	2.69 x 10 <sup>+6</sup>
181	Osmium-191	1.65 x 10 <sup>+1</sup>	1.20 x 10 <sup>+6</sup>	2.40 x 10 <sup>+6</sup>
182	Osmium-191m	1.99 x 10 <sup>+2</sup>	7.13 x 10 <sup>+6</sup>	1.43 x 10 <sup>+7</sup>
183	Osmium-193	4.38 x 10 <sup>+1</sup>	8.46 x 10 <sup>+5</sup>	1.69 x 10 <sup>+6</sup>
184	Oxygen-15 <sup>1</sup>	-	-	-

## SCHEDULE 2 (continued)

<b>Item</b>	<b>Column 1 Radionuclide</b>	<b>Column 2 Release to air concentration (Bq/m<sup>3</sup>)</b>	<b>Column 3 Release to water concentration (Bq/m<sup>3</sup>)</b>	<b>Column 4 Release to sewerage system concentration (Bq/m<sup>3</sup>)</b>
185	Palladium-103	7.44 x 10 <sup>+1</sup>	3.60 x 10 <sup>+6</sup>	7.21 x 10 <sup>+6</sup>
186	Palladium-109	5.96 x 10 <sup>+1</sup>	1.25 x 10 <sup>+6</sup>	2.49 x 10 <sup>+6</sup>
187	Phosphorus-32	9.31 x 10 <sup>0</sup>	2.85 x 10 <sup>+5</sup>	5.71 x 10 <sup>+5</sup>
188	Phosphorus-33	2.13 x 10 <sup>+1</sup>	2.85 x 10 <sup>+6</sup>	5.71 x 10 <sup>+6</sup>
189	Platinum-191	1.57 x 10 <sup>+2</sup>	2.01 x 10 <sup>+6</sup>	4.03 x 10 <sup>+6</sup>
190	Platinum-193m	1.42 x 10 <sup>+2</sup>	1.52 x 10 <sup>+6</sup>	3.04 x 10 <sup>+6</sup>
191	Platinum-197	1.86 x 10 <sup>+2</sup>	1.71 x 10 <sup>+6</sup>	3.42 x 10 <sup>+6</sup>
192	Platinum-197m	6.93 x 10 <sup>+2</sup>	8.15 x 10 <sup>+6</sup>	1.63 x 10 <sup>+7</sup>
193	Plutonium-234	1.35 x 10 <sup>0</sup>	4.28 x 10 <sup>+6</sup>	8.56 x 10 <sup>+6</sup>
194	Plutonium-235	1.15 x 10 <sup>+4</sup>	3.26 x 10 <sup>+8</sup>	6.52 x 10 <sup>+8</sup>
195	Plutonium-236	1.65 x 10 <sup>-3</sup>	7.96 x 10 <sup>+3</sup>	1.59 x 10 <sup>+4</sup>
196	Plutonium-237	8.27 x 10 <sup>+1</sup>	6.85 x 10 <sup>+6</sup>	1.37 x 10 <sup>+7</sup>
197	Plutonium-238	6.93 x 10 <sup>-4</sup>	2.98 x 10 <sup>+3</sup>	5.96 x 10 <sup>+3</sup>
198	Plutonium-239	6.34 x 10 <sup>-4</sup>	2.74 x 10 <sup>+3</sup>	5.48 x 10 <sup>+3</sup>
199	Plutonium-240	6.34 x 10 <sup>-4</sup>	2.74 x 10 <sup>+3</sup>	5.48 x 10 <sup>+3</sup>
200	Plutonium-241	3.50 x 10 <sup>-2</sup>	1.46 x 10 <sup>+5</sup>	2.91 x 10 <sup>+5</sup>
201	Plutonium-242	6.77 x 10 <sup>-4</sup>	2.85 x 10 <sup>+3</sup>	5.71 x 10 <sup>+3</sup>
202	Plutonium-243	2.71 x 10 <sup>+2</sup>	8.06 x 10 <sup>+6</sup>	1.61 x 10 <sup>+7</sup>
203	Plutonium-244	6.77 x 10 <sup>-4</sup>	2.85 x 10 <sup>+3</sup>	5.71 x 10 <sup>+3</sup>
204	Polonium-203	4.88 x 10 <sup>+2</sup>	1.32 x 10 <sup>+7</sup>	2.63 x 10 <sup>+7</sup>
205	Polonium-205	3.35 x 10 <sup>+2</sup>	1.16 x 10 <sup>+7</sup>	2.32 x 10 <sup>+7</sup>
206	Polonium-207	1.99 x 10 <sup>+2</sup>	4.89 x 10 <sup>+6</sup>	9.78 x 10 <sup>+6</sup>
207	Polonium-210	9.93 x 10 <sup>-3</sup>	2.85 x 10 <sup>+3</sup>	5.71 x 10 <sup>+3</sup>
208	Potassium-40	9.93 x 10 <sup>0</sup>	1.10 x 10 <sup>+5</sup>	2.21 x 10 <sup>+5</sup>
209	Potassium-42	1.49 x 10 <sup>+2</sup>	1.59 x 10 <sup>+6</sup>	3.19 x 10 <sup>+6</sup>
210	Potassium-43	1.15 x 10 <sup>+2</sup>	2.74 x 10 <sup>+6</sup>	5.48 x 10 <sup>+6</sup>
211	Praseodymium-142	4.02 x 10 <sup>+1</sup>	5.27 x 10 <sup>+5</sup>	1.05 x 10 <sup>+6</sup>
212	Praseodymium-143	1.29 x 10 <sup>+1</sup>	5.71 x 10 <sup>+5</sup>	1.14 x 10 <sup>+6</sup>
213	Promethium-145	8.76 x 10 <sup>0</sup>	7.06 x 10 <sup>+5</sup>	1.41 x 10 <sup>+6</sup>
214	Promethium-147	6.34 x 10 <sup>0</sup>	2.63 x 10 <sup>+6</sup>	5.27 x 10 <sup>+6</sup>
215	Promethium-149	3.63 x 10 <sup>+1</sup>	6.92 x 10 <sup>+5</sup>	1.38 x 10 <sup>+6</sup>
216	Protactinium-230	4.19 x 10 <sup>-2</sup>	7.44 x 10 <sup>+5</sup>	1.49 x 10 <sup>+6</sup>

## SCHEDULE 2 (continued)

<b>Item</b>	<b>Column 1 Radionuclide</b>	<b>Column 2 Release to air concentration (Bq/m<sup>3</sup>)</b>	<b>Column 3 Release to water concentration (Bq/m<sup>3</sup>)</b>	<b>Column 4 Release to sewerage system concentration (Bq/m<sup>3</sup>)</b>
217	Protactinium-231	2.29 x 10 <sup>-4</sup>	9.65 x 10 <sup>+2</sup>	1.93 x 10 <sup>+3</sup>
218	Protactinium-233	8.05 x 10 <sup>0</sup>	7.87 x 10 <sup>+5</sup>	1.87 x 10 <sup>+6</sup>
219	Radium-223 <sup>1</sup>	4.32 x 10 <sup>-3</sup>	6.85 x 10 <sup>+3</sup>	1.37 x 10 <sup>+4</sup>
220	Radium-224 <sup>1</sup>	1.03 x 10 <sup>-2</sup>	1.05 x 10 <sup>+4</sup>	2.11 x 10 <sup>+4</sup>
221	Radium-225	5.13 x 10 <sup>-3</sup>	7.21 x 10 <sup>+3</sup>	1.44 x 10 <sup>+4</sup>
222	Radium-226 <sup>1</sup>	1.86 x 10 <sup>-3</sup>	2.45 x 10 <sup>+3</sup>	4.89 x 10 <sup>+3</sup>
223	Radium-227	1.06 x 10 <sup>+2</sup>	8.15 x 10 <sup>+6</sup>	1.63 x 10 <sup>+7</sup>
224	Radium-228 <sup>1</sup>	1.15 x 10 <sup>-2</sup>	1.02 x 10 <sup>+3</sup>	2.04 x 10 <sup>+3</sup>
225	Radon-220 <sup>1</sup>	2.25 x 10 <sup>+1</sup>	-	-
226	Radon-222 <sup>1</sup>	1.12 x 10 <sup>+2</sup>	-	-
227	Rhenium-186	2.48 x 10 <sup>+1</sup>	4.57 x 10 <sup>+5</sup>	9.13 x 10 <sup>+5</sup>
228	Rhenium-188	4.02 x 10 <sup>+1</sup>	4.89 x 10 <sup>+5</sup>	9.78 x 10 <sup>+5</sup>
229	Rhodium-103m	1.19 x 10 <sup>+4</sup>	1.80 x 10 <sup>+8</sup>	3.60 x 10 <sup>+8</sup>
230	Rhodium-105	6.77 x 10 <sup>+1</sup>	1.85 x 10 <sup>+6</sup>	3.70 x 10 <sup>+6</sup>
231	Rubidium-81	4.38 x 10 <sup>+2</sup>	1.27 x 10 <sup>+7</sup>	2.54 x 10 <sup>+7</sup>
232	Rubidium-83	2.98 x 10 <sup>+1</sup>	3.60 x 10 <sup>+5</sup>	7.21 x 10 <sup>+5</sup>
233	Rubidium-86	2.29 x 10 <sup>+1</sup>	2.45 x 10 <sup>+5</sup>	4.89 x 10 <sup>+5</sup>
234	Ruthenium-103	1.06 x 10 <sup>+1</sup>	9.38 x 10 <sup>+5</sup>	1.88 x 10 <sup>+6</sup>
235	Ruthenium-105	1.19 x 10 <sup>+2</sup>	2.63 x 10 <sup>+6</sup>	5.27 x 10 <sup>+6</sup>
236	Ruthenium-106 <sup>1</sup>	4.80 x 10 <sup>-1</sup>	9.78 x 10 <sup>+4</sup>	1.96 x 10 <sup>+5</sup>
237	Ruthenium-97	1.86 x 10 <sup>+2</sup>	4.57 x 10 <sup>+6</sup>	9.13 x 10 <sup>+6</sup>
238	Samarium-147	3.35 x 10 <sup>-3</sup>	1.40 x 10 <sup>+4</sup>	2.80 x 10 <sup>+4</sup>
239	Samarium-151	8.05 x 10 <sup>0</sup>	6.99 x 10 <sup>+6</sup>	1.40 x 10 <sup>+7</sup>
240	Samarium-153	4.38 x 10 <sup>+1</sup>	9.26 x 10 <sup>+5</sup>	1.85 x 10 <sup>+6</sup>
241	Scandium-44	9.93 x 10 <sup>+1</sup>	1.96 x 10 <sup>+6</sup>	3.91 x 10 <sup>+6</sup>
242	Scandium-46	4.65 x 10 <sup>0</sup>	4.57 x 10 <sup>+5</sup>	9.13 x 10 <sup>+5</sup>
243	Scandium-47	4.08 x 10 <sup>+1</sup>	1.27 x 10 <sup>+6</sup>	2.54 x 10 <sup>+6</sup>
244	Scandium-48	1.86 x 10 <sup>+1</sup>	4.03 x 10 <sup>+5</sup>	8.06 x 10 <sup>+5</sup>
245	Selenium-73	1.24 x 10 <sup>+2</sup>	1.76 x 10 <sup>+6</sup>	3.51 x 10 <sup>+6</sup>
246	Selenium-75	1.75 x 10 <sup>+1</sup>	2.63 x 10 <sup>+5</sup>	5.27 x 10 <sup>+5</sup>
247	Silicon-31	2.71 x 10 <sup>+2</sup>	4.28 x 10 <sup>+6</sup>	8.56 x 10 <sup>+6</sup>
248	Silicon-32	2.71 x 10 <sup>-1</sup>	1.22 x 10 <sup>+6</sup>	2.45 x 10 <sup>+6</sup>

## SCHEDULE 2 (continued)

<b>Item</b>	<b>Column 1 Radionuclide</b>	<b>Column 2 Release to air concentration (Bq/m<sup>3</sup>)</b>	<b>Column 3 Release to water concentration (Bq/m<sup>3</sup>)</b>	<b>Column 4 Release to sewerage system concentration (Bq/m<sup>3</sup>)</b>
249	Silver-105	3.72 x 10 <sup>+1</sup>	1.46 x 10 <sup>+6</sup>	2.91 x 10 <sup>+6</sup>
250	Silver-110m	2.48 x 10 <sup>0</sup>	2.45 x 10 <sup>+5</sup>	4.89 x 10 <sup>+5</sup>
251	Silver-111	1.75 x 10 <sup>+1</sup>	5.27 x 10 <sup>+5</sup>	1.05 x 10 <sup>+6</sup>
252	Sodium-22	1.49 x 10 <sup>+1</sup>	2.14 x 10 <sup>+5</sup>	4.28 x 10 <sup>+5</sup>
253	Sodium-24	5.62 x 10 <sup>+1</sup>	1.59 x 10 <sup>+6</sup>	3.19 x 10 <sup>+6</sup>
254	Strontium-82	2.98 x 10 <sup>0</sup>	1.12 x 10 <sup>+5</sup>	2.25 x 10 <sup>+5</sup>
255	Strontium-85	3.87 x 10 <sup>+1</sup>	1.22 x 10 <sup>+6</sup>	2.45 x 10 <sup>+6</sup>
256	Strontium-85m	4.02 x 10 <sup>+3</sup>	1.12 x 10 <sup>+8</sup>	2.25 x 10 <sup>+8</sup>
257	Strontium-87m	8.51 x 10 <sup>+2</sup>	2.08 x 10 <sup>+7</sup>	4.15 x 10 <sup>+7</sup>
258	Strontium-89	3.97 x 10 <sup>0</sup>	2.63 x 10 <sup>+5</sup>	5.27 x 10 <sup>+5</sup>
259	Strontium-90 <sup>1</sup>	1.99 x 10 <sup>-1</sup>	2.45 x 10 <sup>+4</sup>	4.89 x 10 <sup>+4</sup>
260	Strontium-91	5.22 x 10 <sup>+1</sup>	9.01 x 10 <sup>+5</sup>	1.80 x 10 <sup>+6</sup>
261	Strontium-92	8.76 x 10 <sup>+1</sup>	1.40 x 10 <sup>+6</sup>	2.80 x 10 <sup>+6</sup>
262	Sulphur-35	2.29 x 10 <sup>+2</sup>	8.90 x 10 <sup>+5</sup>	1.78 x 10 <sup>+6</sup>
263	Tantalum-182	3.07 x 10 <sup>0</sup>	4.57 x 10 <sup>+5</sup>	9.13 x 10 <sup>+5</sup>
264	Technetium-95m	3.42 x 10 <sup>+1</sup>	1.10 x 10 <sup>+6</sup>	2.21 x 10 <sup>+6</sup>
265	Technetium-96	2.98 x 10 <sup>+1</sup>	6.23 x 10 <sup>+5</sup>	1.25 x 10 <sup>+6</sup>
266	Technetium-96m	2.71 x 10 <sup>+3</sup>	5.27 x 10 <sup>+7</sup>	1.05 x 10 <sup>+8</sup>
267	Technetium-97	1.42 x 10 <sup>+2</sup>	8.25 x 10 <sup>+6</sup>	1.65 x 10 <sup>+7</sup>
268	Technetium-97m	9.61 x 10 <sup>0</sup>	1.04 x 10 <sup>+6</sup>	2.08 x 10 <sup>+6</sup>
269	Technetium-99	7.64 x 10 <sup>0</sup>	8.78 x 10 <sup>+5</sup>	1.76 x 10 <sup>+6</sup>
270	Technetium-99m	1.03 x 10 <sup>+3</sup>	3.11 x 10 <sup>+7</sup>	6.23 x 10 <sup>+7</sup>
271	Tellurium-123m	7.64 x 10 <sup>0</sup>	4.89 x 10 <sup>+5</sup>	9.78 x 10 <sup>+5</sup>
272	Tellurium-125m	9.02 x 10 <sup>0</sup>	7.87 x 10 <sup>+5</sup>	1.57 x 10 <sup>+6</sup>
273	Tellurium-127	1.65 x 10 <sup>+2</sup>	4.03 x 10 <sup>+6</sup>	8.06 x 10 <sup>+6</sup>
274	Tellurium-127m	4.14 x 10 <sup>0</sup>	2.98 x 10 <sup>+5</sup>	5.96 x 10 <sup>+5</sup>
275	Tellurium-129	5.22 x 10 <sup>+2</sup>	1.09 x 10 <sup>+7</sup>	2.17 x 10 <sup>+7</sup>
276	Tellurium-129m	4.73 x 10 <sup>0</sup>	2.28 x 10 <sup>+5</sup>	4.57 x 10 <sup>+5</sup>
277	Tellurium-131	4.88 x 10 <sup>+2</sup>	7.87 x 10 <sup>+6</sup>	1.57 x 10 <sup>+7</sup>
278	Tellurium-131m	1.86 x 10 <sup>+1</sup>	3.60 x 10 <sup>+5</sup>	7.21 x 10 <sup>+5</sup>
279	Tellurium-132	9.93 x 10 <sup>0</sup>	1.85 x 10 <sup>+5</sup>	3.70 x 10 <sup>+5</sup>
280	Tellurium-133	6.77 x 10 <sup>+2</sup>	9.51 x 10 <sup>+6</sup>	1.90 x 10 <sup>+7</sup>

## SCHEDULE 2 (continued)

<b>Item</b>	<b>Column 1 Radionuclide</b>	<b>Column 2 Release to air concentration (Bq/m<sup>3</sup>)</b>	<b>Column 3 Release to water concentration (Bq/m<sup>3</sup>)</b>	<b>Column 4 Release to sewerage system concentration (Bq/m<sup>3</sup>)</b>
281	Tellurium-133m	1.57 x 10 <sup>+2</sup>	2.45 x 10 <sup>+6</sup>	4.89 x 10 <sup>+6</sup>
282	Tellurium-134	2.71 x 10 <sup>+2</sup>	6.23 x 10 <sup>+6</sup>	1.25 x 10 <sup>+7</sup>
283	Terbium-149	6.93 x 10 <sup>0</sup>	2.74 x 10 <sup>+6</sup>	5.48 x 10 <sup>+6</sup>
284	Terbium-160	4.51 x 10 <sup>0</sup>	4.28 x 10 <sup>+5</sup>	8.56 x 10 <sup>+5</sup>
285	Thallium-200	1.19 x 10 <sup>+2</sup>	3.42 x 10 <sup>+6</sup>	6.85 x 10 <sup>+6</sup>
286	Thallium-201	3.92 x 10 <sup>+2</sup>	7.21 x 10 <sup>+6</sup>	1.44 x 10 <sup>+7</sup>
287	Thallium-202	9.61 x 10 <sup>+1</sup>	1.52 x 10 <sup>+6</sup>	3.04 x 10 <sup>+6</sup>
288	Thallium-204	4.80 x 10 <sup>+1</sup>	5.27 x 10 <sup>+5</sup>	1.05 x 10 <sup>+6</sup>
289	Thorium-226 <sup>1</sup>	3.82 x 10 <sup>-1</sup>	1.90 x 10 <sup>+6</sup>	3.81 x 10 <sup>+6</sup>
290	Thorium-227	3.10 x 10 <sup>-3</sup>	7.70 x 10 <sup>+4</sup>	1.54 x 10 <sup>+5</sup>
291	Thorium-228 <sup>1</sup>	7.64 x 10 <sup>-4</sup>	9.78 x 10 <sup>+3</sup>	1.96 x 10 <sup>+4</sup>
292	Thorium-229 <sup>1</sup>	3.01 x 10 <sup>-4</sup>	1.43 x 10 <sup>+3</sup>	2.85 x 10 <sup>+3</sup>
293	Thorium-230	7.44 x 10 <sup>-4</sup>	3.26 x 10 <sup>+3</sup>	6.52 x 10 <sup>+3</sup>
294	Thorium-231	7.44 x 10 <sup>+1</sup>	2.01 x 10 <sup>+6</sup>	4.03 x 10 <sup>+6</sup>
295	Thorium-234	4.08 x 10 <sup>0</sup>	2.01 x 10 <sup>+5</sup>	4.03 x 10 <sup>+5</sup>
296	Thorium-nat <sup>1</sup>	7.09 x 10 <sup>-4</sup>	3.11 x 10 <sup>+3</sup>	6.23 x 10 <sup>+3</sup>
297	Thulium-170	4.51 x 10 <sup>0</sup>	5.27 x 10 <sup>+5</sup>	1.05 x 10 <sup>+6</sup>
298	Thulium-171	2.29 x 10 <sup>+1</sup>	6.23 x 10 <sup>+6</sup>	1.25 x 10 <sup>+7</sup>
299	Tin-113	1.19 x 10 <sup>+1</sup>	9.38 x 10 <sup>+5</sup>	1.88 x 10 <sup>+6</sup>
300	Tin-117m	1.29 x 10 <sup>+1</sup>	9.65 x 10 <sup>+5</sup>	1.93 x 10 <sup>+6</sup>
301	Tin-121	1.06 x 10 <sup>+2</sup>	2.98 x 10 <sup>+6</sup>	5.96 x 10 <sup>+6</sup>
302	Tin-125	9.93 x 10 <sup>0</sup>	2.21 x 10 <sup>+5</sup>	4.42 x 10 <sup>+5</sup>
303	Titanium-44	2.48 x 10 <sup>-1</sup>	1.18 x 10 <sup>+5</sup>	2.36 x 10 <sup>+5</sup>
304	Tungsten-181	6.93 x 10 <sup>+2</sup>	8.35 x 10 <sup>+6</sup>	1.67 x 10 <sup>+7</sup>
305	Tungsten-185	1.35 x 10 <sup>+2</sup>	1.37 x 10 <sup>+6</sup>	2.74 x 10 <sup>+6</sup>
306	Tungsten-187	9.02 x 10 <sup>+1</sup>	9.65 x 10 <sup>+5</sup>	1.93 x 10 <sup>+6</sup>
307	Tungsten-188	3.55 x 10 <sup>+1</sup>	2.98 x 10 <sup>+5</sup>	5.96 x 10 <sup>+5</sup>
308	Uranium-230 <sup>1</sup>	1.99 x 10 <sup>-3</sup>	1.25 x 10 <sup>+4</sup>	2.49 x 10 <sup>+4</sup>
309	Uranium-231	7.44 x 10 <sup>+1</sup>	2.45 x 10 <sup>+6</sup>	4.89 x 10 <sup>+6</sup>
310	Uranium-232 <sup>1</sup>	8.51 x 10 <sup>-4</sup>	2.08 x 10 <sup>+3</sup>	4.15 x 10 <sup>+3</sup>
311	Uranium-233	3.42 x 10 <sup>-3</sup>	1.37 x 10 <sup>+4</sup>	2.74 x 10 <sup>+4</sup>
312	Uranium-234	3.50 x 10 <sup>-3</sup>	1.40 x 10 <sup>+4</sup>	2.80 x 10 <sup>+4</sup>

## SCHEDULE 2 (continued)

Item	Column 1 Radionuclide	Column 2 Release to air concentration (Bq/m <sup>3</sup> )	Column 3 Release to water concentration (Bq/m <sup>3</sup> )	Column 4 Release to sewerage system concentration (Bq/m <sup>3</sup> )
313	Uranium-235 <sup>1</sup>	3.87 x 10 <sup>-3</sup>	1.49 x 10 <sup>+4</sup>	2.98 x 10 <sup>+4</sup>
314	Uranium-236	3.77 x 10 <sup>-3</sup>	1.49 x 10 <sup>+4</sup>	2.98 x 10 <sup>+4</sup>
315	Uranium-237	1.65 x 10 <sup>+1</sup>	8.90 x 10 <sup>+5</sup>	1.78 x 10 <sup>+6</sup>
316	Uranium-238 <sup>1</sup>	4.08 x 10 <sup>-3</sup>	1.56 x 10 <sup>+4</sup>	3.11 x 10 <sup>+4</sup>
317	Uranium-239	8.51 x 10 <sup>+2</sup>	2.45 x 10 <sup>+7</sup>	4.89 x 10 <sup>+7</sup>
318	Uranium-240	3.55 x 10 <sup>+1</sup>	6.23 x 10 <sup>+5</sup>	1.25 x 10 <sup>+6</sup>
319	Uranium-nat <sup>1</sup>	4.08 x 10 <sup>-3</sup>	1.56 x 10 <sup>+4</sup>	3.11 x 10 <sup>+4</sup>
320	Vanadium-48	1.10 x 10 <sup>+1</sup>	3.42 x 10 <sup>+5</sup>	6.85 x 10 <sup>+5</sup>
321	Xenon-127	1.41 x 10 <sup>+3</sup>	-	-
322	Xenon-131m <sup>1</sup>	4.28 x 10 <sup>+4</sup>	-	-
323	Xenon-133 <sup>1</sup>	1.14 x 10 <sup>+4</sup>	-	-
324	Xenon-135 <sup>1</sup>	1.43 x 10 <sup>+3</sup>	-	-
325	Ytterbium-169	1.06 x 10 <sup>+1</sup>	9.65 x 10 <sup>+5</sup>	1.93 x 10 <sup>+6</sup>
326	Ytterbium-175	4.25 x 10 <sup>+1</sup>	1.56 x 10 <sup>+6</sup>	3.11 x 10 <sup>+6</sup>
327	Yttrium-88	7.26 x 10 <sup>0</sup>	5.27 x 10 <sup>+5</sup>	1.05 x 10 <sup>+6</sup>
328	Yttrium-90	1.75 x 10 <sup>+1</sup>	2.54 x 10 <sup>+5</sup>	5.07 x 10 <sup>+5</sup>
329	Yttrium-91	3.55 x 10 <sup>0</sup>	2.85 x 10 <sup>+5</sup>	5.71 x 10 <sup>+5</sup>
330	Yttrium-91m	1.99 x 10 <sup>+3</sup>	6.23 x 10 <sup>+7</sup>	1.25 x 10 <sup>+8</sup>
331	Yttrium-92	1.06 x 10 <sup>+2</sup>	1.40 x 10 <sup>+6</sup>	2.80 x 10 <sup>+6</sup>
332	Yttrium-93	4.96 x 10 <sup>+1</sup>	5.71 x 10 <sup>+5</sup>	1.14 x 10 <sup>+6</sup>
333	Zinc-65	1.03 x 10 <sup>+1</sup>	1.76 x 10 <sup>+5</sup>	3.51 x 10 <sup>+5</sup>
334	Zinc-69	6.93 x 10 <sup>+2</sup>	2.21 x 10 <sup>+7</sup>	4.42 x 10 <sup>+7</sup>
335	Zinc-69m	9.02 x 10 <sup>+1</sup>	2.08 x 10 <sup>+6</sup>	4.15 x 10 <sup>+6</sup>
336	Zirconium-88	7.26 x 10 <sup>0</sup>	2.08 x 10 <sup>+6</sup>	4.15 x 10 <sup>+6</sup>
337	Zirconium-93 <sup>1</sup>	1.03 x 10 <sup>0</sup>	2.45 x 10 <sup>+6</sup>	4.89 x 10 <sup>+6</sup>
338	Zirconium-95	5.41 x 10 <sup>0</sup>	7.78 x 10 <sup>+5</sup>	1.56 x 10 <sup>+6</sup>
339	Zirconium-97 <sup>1</sup>	2.13 x 10 <sup>+1</sup>	3.26 x 10 <sup>+5</sup>	6.52 x 10 <sup>+5</sup>

<sup>1</sup> The superscript <sup>1</sup> immediately following an item in column 1 indicates that the item's concentration is the concentration of the parent radionuclide and its progeny when in secular equilibrium.



**SCHEDULE 3****QUALIFICATIONS**

section 27

<b>Column 1</b>	<b>Column 2</b>
<b>Radiation practice</b>	<b>Qualification</b>
plain-film diagnostic radiography of a person	registration under the <i>Medical Act 1939</i>
intra-oral, or extra-oral, dental diagnostic radiography of a person	registration under the <i>Dental Practitioners Registration Act 2001</i>
plain-film diagnostic radiography of the spine, pelvis or extremities of a person	registration under the <i>Chiropractors and Osteopaths Act 1979</i>
plain-film diagnostic radiography of an animal	registration under the <i>Veterinary Surgeons Act 1936</i>

## SCHEDULE 3A

### AUTHORISED PERSONS

section 39A

#### PART 1—DIAGNOSTIC PROCEDURES

<b>Diagnostic procedure</b>	<b>Authorised person</b>
1. Intra-oral and extra-oral dental diagnostic radiography of the teeth and facial bones	A person registered under the <i>Dental Practitioners Registration Act 2001</i> .
2. Intra-oral bitewing dental diagnostic radiography	A person holding the operative dental auxiliary prescribed designation of school dental therapist under the <i>Dental Practitioners Registration Regulation 2001</i> , if the intra-oral bitewing dental radiography is to be performed under a protocol for intra-oral bitewing dental radiography approved by the chief executive.
3. Plain film diagnostic radiography	A medical practitioner or a person undergoing a period of training or internship as a medical practitioner as required by the Medical Board of Queensland.
4. Plain film diagnostic radiography of the hand and wrist	A person registered under the <i>Dental Practitioners Registration Act 2001</i> .
5. Plain film diagnostic radiography of the foot and ankle	A person registered as a podiatrist under the <i>Podiatrists Act 1969</i> .

## SCHEDULE 3A (continued)

<b>Diagnostic procedure</b>	<b>Authorised person</b>
6. Plain film diagnostic radiography of the chest and extremities ( <i>distal to the shoulder and hip</i> )	<p>A person registered as a registered nurse under the <i>Nursing Act 1992</i>, who is—</p> <p>(a) employed at a public sector health service facility which has a protocol, for requesting diagnostic radiography, approved by the chief executive; and</p> <p>(b) approved to request X-rays under the protocol for the public sector health service facility at which the person is employed.</p>
7. Plain film diagnostic radiography of the neuromusculoskeletal system	<p>A person who—</p> <p>(a) is registered as a chiropractor and osteopath under the <i>Chiropractors and Osteopaths Act 1979</i>; and</p> <p>(b) either—</p> <p>(i) holds a chiropractic qualification; or</p> <p>(ii) was registered under section 18(1)(c) of the <i>Chiropractors and Osteopaths Act 1979</i> as in force immediately before the commencement of the <i>Chiropractic Manipulative Therapists Act Amendment Act 1988</i>, section 9.</p>

## SCHEDULE 3A (continued)

Diagnostic procedure	Authorised person
8. Plain film diagnostic radiography of the chest	The chief executive, for screening for tuberculosis, under a protocol for tuberculosis screening approved by the chief executive, of a person who presents at a public sector health service facility which undertakes screening procedures for tuberculosis.
9. Mammography	<p>The chief executive, for mammography, under a protocol for breast cancer screening approved by the chief executive, of a woman who—</p> <p>(a) presents at a BreastScreen Queensland Service for the purpose of breast cancer screening; and</p> <p>(b) is eligible to participate in the Queensland Health BreastScreen Queensland Program; and</p> <p>(c) signs the “BreastScreen Queensland Consent for Screening Mammogram” form.</p>
10. Computed tomography, and mammography	<p>A person who is—</p> <p>(a) registered as a specialist in the field of diagnostic radiology under the <i>Medical Act 1939</i>; or</p> <p>(b) a medical practitioner and undergoing a period of training in the field of diagnostic radiology.</p>

## SCHEDULE 3A (continued)

<b>Diagnostic procedure</b>	<b>Authorised person</b>
<b>11.</b> Computed tomography, mammography and bone mineral densitometry	<p>If the procedure to be carried out by the treating practitioner is part of a radiation oncology procedure—a person who is—</p> <p>(a) registered as a specialist in the field of radiation oncology under the <i>Medical Act 1939</i>; or</p> <p>(b) a medical practitioner and undergoing a period of training in the field of radiation oncology.</p>
<b>12.</b> Fluoroscopy	<p>A person who is—</p> <p>(a) registered as a specialist under the <i>Medical Act 1939</i>; or</p> <p>(b) a medical practitioner and undergoing a period of training as a specialist.</p>
<b>13.</b> Bone mineral densitometry	<p>A person who is—</p> <p>(a) registered as a specialist in the field of diagnostic radiology, nuclear medicine or endocrinology under the <i>Medical Act 1939</i>; or</p> <p>(b) a medical practitioner and undergoing a period of training in the field of diagnostic radiology, nuclear medicine or endocrinology.</p>

## SCHEDULE 3A (continued)

Diagnostic procedure	Authorised person
14. Diagnostic medicine nuclear	<p>A person who is—</p> <p>(a) registered as a specialist in the field of nuclear medicine under the <i>Medical Act 1939</i>; or</p> <p>(b) a medical practitioner and undergoing a period of training in the field of nuclear medicine.</p>
15. In vivo tests for pathology involving the use of unsealed radioactive substances	<p>A person who is—</p> <p>(a) registered as a specialist in the field of pathology under the <i>Medical Act 1939</i>; or</p> <p>(b) a medical practitioner and undergoing a period of training in the field of pathology.</p>
16. Diagnostic procedures involving the use of laser apparatus	<p>A person who is—</p> <p>(a) a medical practitioner, or a person undergoing a period of training or internship as a medical practitioner as required by the Medical Board of Queensland; or</p> <p>(b) registered under the <i>Dental Practitioners Registration Act 2001</i>.</p>

## SCHEDULE 3A (continued)

**PART 2—THERAPEUTIC PROCEDURES**

<b>Therapeutic Procedure</b>	<b>Authorised Person</b>
<b>17.</b> Treatment of malignant and benign conditions involving the use of radiation sources	A person who is— (a) registered as a specialist in the field of radiation oncology under the <i>Medical Act 1939</i> ; or (b) a medical practitioner and undergoing a period of training in the field of radiation oncology.
<b>18.</b> Treatment of benign conditions involving the use of unsealed radioactive substances	A person who holds a written approval from the chief executive, stating the person is competent to carry out the procedure and who is— (a) registered as a specialist in the field of nuclear medicine under the <i>Medical Act 1939</i> ; or (b) a medical practitioner and undergoing a period of training in the field of nuclear medicine.

## SCHEDULE 3A (continued)

<b>Therapeutic Procedure</b>	<b>Authorised Person</b>
<b>19.</b> Treatment of malignant conditions involving the use of unsealed radioactive substances	A person— (a) who holds a written approval from the chief executive, stating the person is competent to carry out the procedure; and (b) who is— (i) registered as a specialist in the field of nuclear medicine under the <i>Medical Act 1939</i> ; or (ii) a medical practitioner and undergoing a period of training in the field of nuclear medicine; and (c) whose decision to request the procedure is in accordance with a decision, about the desired outcome of the treatment, made by the person and a person registered as a specialist in the field of radiation oncology under the <i>Medical Act 1939</i> .



## SCHEDULE 3A (continued)

Therapeutic Procedure	Authorised Person
20. Treatment of skin lesions involving the use of sealed radioactive substances	A person— (a) who is— (i) registered as a specialist in the field of dermatology under the <i>Medical Act 1939</i> ; or (ii) a medical practitioner and undergoing a period of training in the field of dermatology; and (b) whose decision to request the procedure is in accordance with a decision, about the desired outcome of the treatment, made by the person and a person registered as a specialist in the field of radiation oncology under the <i>Medical Act 1939</i> .
21. Treatment of eye lesions involving the use of sealed radioactive substances	A person who is— (a) registered as a specialist in the field of ophthalmology under the <i>Medical Act 1939</i> ; or (b) a medical practitioner and undergoing a period of training in the field of ophthalmology.

## SCHEDULE 3A (continued)

<b>Therapeutic Procedure</b>	<b>Authorised Person</b>
<b>22.</b> Treatment of vascular stenosis	A person— <ul style="list-style-type: none"><li>(a) who is—<ul style="list-style-type: none"><li>(i) registered as a specialist in the field of cardiology, vascular surgery or diagnostic radiology under the <i>Medical Act 1939</i>; or</li><li>(ii) a medical practitioner and undergoing a period of training in the field of cardiology, vascular surgery or diagnostic radiology; and</li></ul></li><li>(b) whose decision to request the procedure is in accordance with a decision about the desired outcome of the treatment, made by the person and another person who is—<ul style="list-style-type: none"><li>(i) registered as a specialist in the field of nuclear medicine under the <i>Medical Act 1939</i> and holds a written approval from the chief executive stating the person is competent to carry out the procedure; or</li><li>(ii) registered as a specialist in the field of radiation oncology under the <i>Medical Act 1939</i>.</li></ul></li></ul>

## SCHEDULE 3A (continued)

<b>Therapeutic Procedure</b>	<b>Authorised Person</b>
<b>23.</b> Therapeutic procedures involving the use of laser apparatus	A person who is— (a) a medical practitioner, or a person undergoing a period of training or internship as a medical practitioner as required by the Medical Board of Queensland; or (b) registered under the <i>Dental Practitioners Registration Act 2001</i> .

**SCHEDULE 4****TRAINING**

section 41

1. Course entitled 'Compliance testing of diagnostic imaging equipment training course' conducted by the department
2. Course entitled 'Laser concepts in health care' conducted by the Australian Centre for Medical Laser Technology

---

## SCHEDULE 5

### FEES

section 54

#### PART 1—POSSESSION LICENCES

##### *Division 1—Radiation practices carried out with radioactive substances*

	\$
1. Application fee for a possession licence . . . . .	105.00
2. Possession licence—	
(a) 1 year or less—	
(i) base fee . . . . .	126.00
(ii) for each sealed radioactive substance or type of unsealed radioactive substance . . . . .	10.00
(b) more than 1 year but not more than 2 years—	
(i) base fee . . . . .	253.00
(ii) for each sealed radioactive substance or type of unsealed radioactive substance . . . . .	20.00
(c) more than 2 years but not more than 3 years—	
(i) base fee . . . . .	379.00
(ii) for each sealed radioactive substance or type of unsealed radioactive substance . . . . .	30.00

## SCHEDULE 5 (continued)

***Division 2—Radiation practices carried out with ionising radiation apparatus***

	\$
3. Application fee for a possession licence . . . . .	105.00
4. Possession licence—	
(a) 1 year or less—	
(i) base fee . . . . .	126.00
(ii) for each ionising radiation apparatus . . . . .	20.00
(b) more than 1 year but not more than 2 years—	
(i) base fee . . . . .	253.00
(ii) for each ionising radiation apparatus . . . . .	40.00
(c) more than 2 years but not more than 3 years—	
(i) base fee . . . . .	379.00
(ii) for each ionising radiation apparatus . . . . .	60.00

***Division 3—Radiation practices carried out with non-ionising radiation apparatus***

	\$
5. Application fee for a possession licence . . . . .	105.00
6. Possession licence—	
(a) 1 year or less—	
(i) base fee . . . . .	126.00
(ii) for each non-ionising radiation apparatus . . . . .	10.00
(b) more than 1 year but not more than 2 years—	
(i) base fee . . . . .	253.00
(ii) for each non-ionising radiation apparatus . . . . .	20.00
(c) more than 2 years but not more than 3 years—	
(i) base fee . . . . .	379.00
(ii) for each non-ionising radiation apparatus . . . . .	30.00

## SCHEDULE 5 (continued)

**PART 2—USE AND TRANSPORT LICENCES**

	\$
7. Application fee for a use or transport licence . . . . .	53.00
8. Use or transport licence—	
(a) 1 year or less . . . . .	36.00
(b) more than 1 year but not more than 2 years. . . . .	73.00
(c) more than 2 years but not more than 3 years. . . . .	109.00

**PART 3—OTHER ACT INSTRUMENTS**

	\$
9. Approval to dispose . . . . .	53.00
10. Application fee for an accreditation certificate . . . . .	105.00
11. Accreditation certificate—	
(a) 1 year or less . . . . .	53.00
(b) more than 1 year but not more than 2 years. . . . .	105.00
(c) more than 2 years but not more than 3 years. . . . .	158.00
12. Application fee for a radiation safety officer certificate . . . . .	36.00
13. Radiation safety officer certificate—	
(a) 1 year or less . . . . .	36.00
(b) more than 1 year but not more than 2 years. . . . .	73.00
(c) more than 2 years but not more than 3 years. . . . .	109.00

## SCHEDULE 5 (continued)

**PART 4—OTHER FEES**

	\$
<b>14.</b> Application by the holder of a conditional Act instrument to change the conditions of the instrument imposed by the chief executive . . . . .	105.00
<b>15.</b> Application by a possession licensee to change the licensee's approved radiation safety and protection plan for a radiation practice . . . . .	53.00
<b>16.</b> Issue of another Act instrument to replace a lost, stolen, destroyed or damaged Act instrument . . . . .	10.00
<b>17.</b> Copy of the register or a part of it (for each page) . . . . .	1.00



**SCHEDULE 6****DICTIONARY**

section 3

**“abrasive blasting material”** means material that could reasonably be used for abrasive blasting.

**“ancillary imaging equipment”**, used in connection with the use of a radiation source to carry out a radiation practice involving the production of images, means equipment, other than the source, used in the production and viewing of the images.

**“ARMCANZ”** means the Agriculture and Resource Management Council of Australia and New Zealand.

**“AS”** means an Australian Standard published by Standards Australia.

**“AS/NZS”** means an Australian/New Zealand Standard jointly published by Standards Australia and Standards New Zealand.

**“Bq”** means a becquerel.

**“cabinet radiation apparatus”** means an ionising radiation apparatus—

- (a) contained in a cabinet that is shielded in a way that minimises the transmission of ionising radiation through the shielding; and
- (b) used for the radiographic, or fluoroscopic, imaging of—
  - (i) things for security, or quality control, purposes; or
  - (ii) excised tissue for pathology purposes.

**“contamination”**, of a person, premises or thing, means the lodgment, attachment or incorporation of radioactive material on, to or in the person, premises or thing.

## SCHEDULE 6 (continued)

**“educational institution”** means a school, university, training institution or professional college that—

- (a) educates persons about radiation sources; or
- (b) uses radiation sources in the course of its education of persons.

**“enclosed radiation apparatus”** means an ionising radiation apparatus—

- (a) contained in a cabinet that is shielded in a way that minimises the transmission of ionising radiation through the shielding; and
- (b) used for monitoring industrial processes or industrial gauging.

**“equivalent dose”**, for a person’s organ or tissue that is exposed to radiation, means the equivalent dose for the organ or tissue, calculated in accordance with the document entitled ‘Recommendations for limiting exposure to ionizing radiation (1995) (Guidance note [NOHSC:3022(1995)])’ prepared by NHMRC.

**“external effective dose”**, received by a person, means the total of the weighted equivalent doses for all organs and tissues of the person as a result of exposure of the organs and tissues to radiation emitted from ionising radiation sources external to the person’s body.

**“gaseous tritium light device”** means equipment or an instrument, article or subassembly incorporating a sealed glass container—

- (a) filled with the radionuclide hydrogen-3 in a gaseous form; and
- (b) coated internally with a phosphor.

**“GBq”** means a gigabecquerel.

**“gigabecquerel”** means 1 000 000 000 becquerels.

**“health-related exposure”**, of a person to ionising radiation, means the exposure of the person to the radiation while undergoing a diagnostic or therapeutic procedure involving the irradiation of the person.

## SCHEDULE 6 (continued)

- “ICRP”** means the International Commission on Radiological Protection.
- “internal effective dose”**, received by a person, means the effective dose from a radionuclide inhaled, ingested or introduced into the person’s body, calculated in accordance with the document entitled ‘Dose Coefficients for Intakes of Radionuclides by Workers’, and known as ‘ICRP Publication 68’, prepared by ICRP.<sup>29</sup>
- “kBq”** means a kilobecquerel.
- “kilobecquerel”** means 1 000 becquerels.
- “laser apparatus”** means a laser that is a radiation apparatus under section 7.
- “laser standard”** means AS/NZS 2211.1-1997 (Laser safety, Part 1: Equipment classification, requirements and user’s guide).
- “MBq”** means a megabecquerel.
- “megabecquerel”** means 1 000 000 becquerels.
- “microgray”** means 1/1 000 000 part of a gray.

---

<sup>29</sup> The document may be purchased from Elsevier Science Ltd, The Boulevard, Langford Lane, Kidlington, Oxford, OX5 1GB, United Kingdom.

## SCHEDULE 6 (continued)

“**millisievert**” means 1/1 000 part of a sievert.

“**mineral**” see the *Mineral Resources Act 1989*, section 5.<sup>30</sup>

“**mineral substances**” see section 5(1).

“**mSv**” means a millisievert.

“**natural background exposure**”, of a person to ionising radiation, means the exposure of the person to ionising radiation occurring naturally in the environment, other than exposure to ionising radiation directly attributable to the carrying out of a radiation practice.

“**NHMRC**” means the National Health and Medical Research Council.

---

30 *Mineral Resources Act 1989*, section 5 —

“**mineral**” means a substance which normally occurs naturally as part of the earth’s crust or is dissolved or suspended in water within or upon the earth’s crust and includes a substance which may be extracted from such a substance, and includes—

- (a) clay if mined for use for its ceramic properties, kaolin and bentonite;
- (b) foundry sand;
- (c) hydrocarbons and other substances or matter occurring in association with shale or coal and necessarily mined, extracted, produced or released by or in connection with mining for shale or coal or for the purpose of enhancing the safety of current or future mining operations for coal or the extraction or production of mineral oil therefrom;
- (d) limestone if mined for use for its chemical properties;
- (e) marble;
- (f) mineral oil or gas extracted or produced from shale or coal by in situ processes;
- (g) peat;
- (h) salt including brine;
- (i) shale from which mineral oil may be extracted or produced;
- (j) silica, including silica sand, if mined for use for its chemical properties;
- (k) rock mined in block or slab form for building or monumental purposes;

but does not include—

- (l) living matter;
- (m) petroleum within the meaning of the *Petroleum Act 1923*;
- (n) soil, sand, gravel or rock (other than rock mined in block or slab form for building or monumental purposes) to be used or to be supplied for use as such, whether intact or in broken form;
- (o) water.

## SCHEDULE 6 (continued)

**“nuclear medicine image”** means an image produced as a result of the detection of the radiation emitted by a radionuclide in a person, after the person has been administered, or injected with, a radiopharmaceutical.

**“occupational exposure”**, of a person to ionising radiation, means the exposure of the person to the radiation in the course of the person’s work, other than natural background exposure to ionising radiation.

**“personal protective equipment”** means equipment that, when worn by a person while involved in carrying out a radiation practice, reduces the exposure of the person to radiation attributable to the carrying out of the practice.

**“public exposure”**, of a person to ionising radiation, means the exposure of the person to the radiation, other than health-related exposure, natural background exposure or occupational exposure to ionising radiation.

**“public sector health service”** has the meaning in the *Health Services Act 1991*, section 2.<sup>31</sup>

**“quality control procedures”**, for ancillary imaging equipment used in connection with the use of a radiation source to carry out a radiation practice involving the production of images, means preventative maintenance, or routine checking, procedures undertaken to ensure the correct operation of the equipment for the practice.

**“quality control procedures”**, for a radiation source used in carrying out a radiation practice, means—

- (a) if the source is a radiation apparatus—preventative maintenance, or routine checking, procedures undertaken to ensure the correct operation of the apparatus for the practice; or
- (b) if the source is a radioactive substance—routine checking procedures undertaken to verify the suitability of the substance for the practice.

**“quality control procedures”**, for a sealed source apparatus used in carrying out a radiation practice, means preventative maintenance, or routine checking, procedures undertaken to ensure the correct operation of the apparatus for the practice.

---

31 *Health Services Act 1991*, section 2 (Definitions)

## SCHEDULE 6 (continued)

“**safety device**” means a device that, when used by a person while involved in carrying out a radiation practice, reduces the exposure of the person to radiation attributable to the carrying out of the practice, but does not include personal protective equipment.

“**SI**” means the International System of Units.

“**sievert**”, for a total effective or equivalent dose, means the SI unit for the dose.

“**TCLP**” means the toxicity characteristics leaching procedure stated in AS 4439.2-1997 (Wastes, sediments and contaminated soils, Part 2: Preparation of leachates—Zero headspace procedure).

“**total effective dose**”, for a person for a period, means the total of the external, and internal, effective doses received by the person during the period.

“**transport code of practice**” means the Code of Practice for the Safe Transport of Radioactive Substances 1990 issued under the *Environment Protection (Nuclear Codes) Act 1978* (Cwlth).

“**veterinary surgeon**” has the meaning in the *Veterinary Surgeons Act 1936*, section 3.<sup>32</sup>

“**weighted equivalent dose**”, for a person’s organ or tissue that is exposed to radiation, means the product of—

- (a) the tissue weighting factor for the organ or tissue stated in table 2 of the document entitled ‘Recommendations for limiting exposure to ionizing radiation (1995) (Guidance note [NOHSC:3022(1995)])’ prepared by NHMRC; and
- (b) the equivalent dose for the organ or tissue.

---

32 *Veterinary Surgeons Act 1936*, section 3 (Definitions)

## ENDNOTES

### 1 Index to endnotes

		Page
2	Date to which amendments incorporated . . . . .	93
3	Key . . . . .	93
4	Table of earlier reprints . . . . .	94
5	List of legislation . . . . .	94
6	List of annotations . . . . .	94

### 2 Date to which amendments incorporated

This is the reprint date mentioned in the Reprints Act 1992, section 5(c). Accordingly, this reprint includes all amendments that commenced operation on or before 22 February 2002. Future amendments of the Radiation Safety Regulation 1999 may be made in accordance with this reprint under the Reprints Act 1992, section 49.

### 3 Key

#### Key to abbreviations in list of legislation and annotations

Key	Explanation	Key	Explanation
AIA	= Acts Interpretation Act 1954	prev	= previous
amd	= amended	(prev)	= previously
amdt	= amendment	proc	= proclamation
ch	= chapter	prov	= provision
def	= definition	pt	= part
div	= division	pubd	= published
exp	= expires/expired	R[X]	= Reprint No.[X]
gaz	= gazette	RA	= Reprints Act 1992
hdg	= heading	reloc	= relocated
ins	= inserted	renum	= renumbered
lap	= lapsed	rep	= repealed
notfd	= notified	s	= section
o in c	= order in council	sch	= schedule
om	= omitted	sdiv	= subdivision
orig	= original	SIA	= Statutory Instruments Act 1992
p	= page	SIR	= Statutory Instruments Regulation 1992
para	= paragraph	SL	= subordinate legislation
prec	= preceding	sub	= substituted
pres	= present	unnum	= unnumbered

## **4 Table of earlier reprints**

Reprints are issued for both future and past effective dates. For the most up-to-date table of reprints, see the reprint with the latest effective date.

## **5 List of legislation**

### **Radiation Safety Regulation 1999 SL No. 330**

made by the Governor in Council on 16 December 1999

notfd gaz 17 December 1999 pp 1586–9

ss 1–2 commenced on date of notification

remaining provisions commenced 1 January 2000 (see s 2)

exp 1 September 2010 (see SIA s 54)

Note—A regulatory impact statement and explanatory note were prepared amending legislation—

### **Radiation Safety Amendment Regulation (No. 1) 2000 SL No. 69**

notfd gaz 20 April 2000 pp 1533–6

s 11 commenced 1 January 2000 (see s 2)

remaining provisions commenced on date of notification

### **Dental Practitioners Registration Regulation 2001 SL No. 264 ss 1–2, 17 sch 5**

notfd gaz 14 December 2001 pp 1351–4

ss 1–2 commenced on date of notification

remaining provisions commenced 1 January 2002 (see s 2)

### **Health Legislation Amendment Regulation (No. 1) 2002 SL No. 20 pts 1, 6**

notfd gaz 15 February 2002 pp 618–19

commenced on date of notification

## **6 List of annotations**

### **PART 3—ACT INSTRUMENTS**

**pt hdg** sub 2000 SL No. 69 s 4

### **Notification of change of circumstances—Act, s 92(2)**

**s 8A** ins 2000 SL No. 69 s 4

### **Radiation practices involving the carrying out of a diagnostic, therapeutic or cosmetic procedure involving the irradiation of a person—Act, s 28(6)**

**s 23** amd 2000 SL No. 69 s 5

### **Mineral substances that are not radioactive substances**

**s 35A** ins 2000 SL No. 69 s 6

### **PART 8A—AUTHORISED PERSONS**

**pt 8A (s 39A)** ins 2000 SL No. 69 s 7



**Exemption from requirement for use licence—Act, s 210****s 43** amd 2000 SL No. 69 s 8**Abrasive blasting material containing radionuclides—Act, s 210****s 51** amd 2000 SL No. 69 s 9**PART 9A—REGISTERS****pt 9A (ss 53A–53E)** ins 2000 SL No. 69 s 10**PART 9B—DISCLOSURE OF PROTECTED INFORMATION****pt 9B (s 53F)** ins 2000 SL No. 69 s 10**Waiver of fees—general****s 57 prov hdg** sub 2000 SL No. 69 s 11**Waiver of fees—undergraduates’ professional development year****s 57A** ins 2000 SL No. 69 s 12**PART 11—CONSEQUENTIAL AMENDMENT****pt 11 (s 59)** om R1 (see RA s 40)**SCHEDULE 3—QUALIFICATIONS**

amd 2001 SL No. 264 s 17 sch 5

**SCHEDULE 3A—AUTHORISED PERSONS**

ins 2000 SL No. 69 s 13

amd 2001 SL No. 264 s 17 sch 5

**SCHEDULE 5—FEES**

sub 2002 SL No. 20 s 15

**SCHEDULE 6—DICTIONARY**def “**cabinet radiation apparatus**” amd 2000 SL No. 69 s 14(2)def “**public sector health service**” ins 2000 SL No. 69 s 14(1)def “**veterinary surgeon**” ins 2000 SL No. 69 s 14(1)