Radiation Management Plan

Veterinary Radiation Management Plan for use in the ACT (not including veterinary CT, fluoroscopy, brachytherapy or external beam radiation therapy)

# Introduction

Radiation Management Plan of Insert Company Name

for the practice of veterinary medicine

to be carried out at Insert address

Document Number: Insert a unique reference number relevant to the Company

Prepared by: Insert Name

Date **Prepared**: Click here to enter a date

Date **submitted** to the ACT Radiation Council: Click here to enter a date

Date of scheduled **review**: No more than 12 months after the date submitted

Scheduled annual review date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date of last review: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The ACT Radiation Council (the Council) has determined that, whilst advice can be sought externally, the responsibility for radiation safety cannot be delegated to a third party, and the Council therefore requires that the RSO must be: someone employed to provide daily advice/supervision services on behalf of the organisation; suitably qualified; and reasonably available to attend the site as required, having regard to the attendant risk of the source type(s) at the location.

Radiation Safety Officer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Phone: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Responsible Person: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Position: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Phone: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Work location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Guidance on the use of this template**

This template is designed as an aid to the development of a Radiation Management Plan only. The template may not apply to your practice. As the radiation protection requirements are unique for each situation an appropriate Plan must be prepared. ACT Health does not take responsibility or liability for any protection measures in this template. The use of the template does not in any way imply that approval will be granted, applications are assessed by the ACT Radiation Council.

All text in this document must be reviewed to ensure that it is appropriate to the specific context of the practice. In general, the un-highlighted text provides generic information which will apply to many practices. Some text is **bolded** as an aid to readability only, which does not infer any additional meaning.

Sections which are highlighted in light grey, Such as this, provide information to the person completing the template. They must be deleted and replaced with content as indicated.

Sections which are highlighted in dark grey, such as this, provide example information that may be applicable to the practice. They must be reviewed and, if appropriate, the highlighting should be removed, or the example replaced by practice-specific information.

These guidance notes should be deleted before submitting the plan to the ACT Health Directorate.

For further information please contact the Health Protection Service at [HPS@act.gov.au](mailto:HPS@act.gov.au) or on (02) 5124 9700

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## Scope

The purpose of this plan is to ensure that the practice of veterinary medicine is conducted as safely as possible and in compliance with the *Radiation Protection Act 2006,* the *Radiation Protection Regulation 2007*, the *Code for Radiation Protection in Planned Exposure Situations (2016)* (RPS C-1) (the Planned Exposure Code), and the *Code of Practice for Radiation Protection in Veterinary Medicine (2009)* (the Vet Code).

It should be **read by all employees** who will deal with any radiation sources at the Veterinary Practice, and must be readily available to all staff.

## Responsibilities of employer and employees

**Employers** have a responsibility to provide employees with a **safe working environment**. Employees are also responsible for their safety and that of their co-workers.

Chapters 5 and 6 of the *National standard for limiting occupational exposure to ionizing radiation* NOHSC:1013 – 1995 (RPS1), and Section 3 of the Planned Exposure Code (RPS C-1) outline the duties that employers and employees respectively must carry out. This includes but is not limited to obtaining regulatory approvals and monitoring, as well as implementing and updating work procedures to keep exposures to ionizing radiation as low as reasonably achievable (ALARA), economic and societal factors being taken into account.

**All employees** are required to understand and follow the radiation protection practices outlined in this plan.

## Framework of Radiation Protection

The **management of risks** from ionising radiation requires actions that are based on fundamental principles of radiation protection, safety and security.

A brief summary of the radiation protection principles as they apply to veterinary applications is provided in this section.

### Categories of Exposure

There are a number of persons who may be exposed to radiation from sources at this practice. These exposures are **planned exposure situations** as they involve the deliberate introduction and operation of radiation sources. Exposure from background or natural sources are not covered by this plan.

**Occupational** exposures are incurred by staff at the veterinary practice. This includes the dose received by the operators of the equipment as well as any other staff who may be exposed in the workplace.

**Medical** exposure is the exposure of patients as part of their medical diagnosis or treatment, and carers and comforters. This is not directly applicable in the context of veterinary medicine. However, some parallels can be drawn between medical exposure and exposure to animals during treatment.

**Member of the Public** is any other person including visitors, owners of the patients and people in adjoining tenancies. Exposures of the embryo or foetus of pregnant workers are considered to be public exposures.

### Fundamental Principles of Radiation Protection

Justification:

The principle of justification requires that the **radiation exposure** situation should **do more good than harm**. That is, the potential risk due to exposure should be less than the benefit to an individual or to society.

In the case of veterinary exposure the benefit is primarily to the **animal**. The justification for veterinary exposure is primarily based on **clinical judgement** first with regard to the specific **procedure** to be used and then on a **case-by-case basis**. The justification must take into account **exposure to operators** and other persons.

Optimisation:

Protection must be optimised so that **radiation risks are as low as reasonably achievable (ALARA),** societal and economic factors taken into account.

This includes the **dose reduction** strategies of minimising **time** exposed to radiation, maximising **distance** from the radiation source, and using appropriate **shielding**.

Optimisation programs can include the use of **dose constraints** and comparisons to **reference levels** or doses received at similar practices.

Limitation:

Limits are set for **Occupational** and **Public Exposure** in RPS C-1. Limits ensure that no individual bears an unacceptable risk of harm.

**Limits are insufficient in themselves** to ensure the best achievable protection under the circumstances, and both the optimisation of protection and the limitation of doses and risks to individuals are necessary to achieve the highest standards of safety.

### Prevention of and response to Incidents and Accidents

Efforts must be made to **prevent accidents**, and to **reduce the severity** of radiation risks associated with any reasonably foreseeable event. **Incidents** can result from a variety of causes including inadvertent actions, equipment failure, negligence, or deliberately not following procedures.

Preventing incidents can be achieved though the implementation of a range of procedures, regular checks and reviews, and the use of physical protective measures. When properly implemented, this **defence-in-depth** ensures that no single technical, human or organisational failure would result in adverse consequences.

This also includes the **reporting** of radiation incidents both internally and to the regulator where appropriate.

# Overview

## The Responsible Person and Radiation Safety Officer (RSO)

The **Responsible Person** is the legal person who has **overall management responsibility** and in whose name the sources are registered. This includes having responsibility for the security and maintenance of the sources, and control over who may use the sources.

A **Radiation Safety Officer** must be appointed to **assist** the Responsible Person in ensuring that the following duties are carried out. The Radiation Safety Officer must have sufficient knowledge and experience to ensure that radiation safety requirements are fulfilled at the practice. The Radiation Safety Officer may be the same person as the Responsible Person.

The **Responsible Person** and the **Radiation Safety Officer** at this practice are:

List the **name** and **contact details** of the Responsible Person, and the Radiation Safety Officer (with a short **summary of their qualifications and/or experience**).

The Responsible Person **must**:

* ensure a suitable **Radiation Management Plan** (RMP) is developed, documented, resourced, implemented and regularly reviewed;
* ensure all persons affected by the RMP follow and comply with the plan, the Vet Code and the Planned Exposure Code;
* ensure that a **veterinary surgeon approves procedures** which comply with this plan and ensure that radiation exposures are justified and optimised;
* ensure that only persons **appropriately licensed** by the ACT Radiation Council may use or operate a radiation source;
* ensure that only sources appropriately registered by the ACT Radiation Council are used;
* ensure that **personal radiation monitoring devices** are supplied to the appropriate people;
* ensure that appropriate **records are maintained**;
* ensure **staff are appropriately trained** and informed;
* know the actions required to carry out the **emergency procedures** (including reporting) as specified in this plan;
* understand the **precautions** (including the use of protective clothing and equipment) and understand the extent to which the precautions should be taken in handling the radiation source;
* ensure that the veterinary **facility** is designed, constructed, shielded, used, and maintained appropriately;
* ensure **warning notices** are displayed prominently where required;
* ensure that **a quality assurance programme is initiated and maintained and that equipment is maintained** in accordance with the Vet Code; and
* advise the Health Protection Service of the **receipt or disposal** of any radiation source.

## Persons dealing with radiation

A complete list of persons who deal with radiation sources is provided in Appendix A.

The following **people deal with radiation sources** at this practice:

Include In this section a description of the roles and responsibilities for classes of persons who are likely to deal with a radiation source at the practice.

### Veterinary Surgeons

Licensed **veterinary surgeons** approve, justify and optimise radiation procedures and may use radiation sources. Licensed Veterinary Surgeons may directly supervise other registered veterinarians and qualified veterinary nurses in the use of radiation sources. Whilst directly supervising or directing another member of staff in the use of a radiation source they are responsible for all aspects of radiation safety including ensuring that all instructions given are followed.

When **approving a procedure** involving the exposure of an animal to ionizing radiation, the veterinary surgeon must:

* ensure the procedure complies with the relevant provisions of the **Radiation Management Plan**;
* **justify** the radiation exposures, taking into account:
  + the need to carry out the procedure;
  + the potential detriment to operators, assistants and the owner or carer of the animal;
  + the efficacy, benefits and risk of available alternate techniques having the same objectives with less or no exposure to ionizing radiation; and
* **optimise** the radiation exposures, ensuring that radiation doses to occupationally exposed persons and members of the public:
  + do not exceed the dose limits specified in RPS C-1
  + are kept as low as reasonably achievable, economic and societal factors being taken into account.

### The Operator

Only a person who is **appropriately authorised** under a Licence issued by the ACT Radiation Council may perform ionizing radiation procedures on animals.

Licensed **veterinary surgeons and** licensed **veterinary nurses** may use diagnostic X-ray apparatus where the procedure has been formally requested by a veterinary surgeon.

Veterinary nurses and staff undergoing training may, under the direct and physical supervision of a Licensed Veterinary Surgeon, use X-ray apparatus as directed.

**The operator must:**

* **comply** with all relevant provisions of the **Radiation Management Plan**;
* not carry out an ionizing radiation procedure unless the procedure has been formally **requested by a veterinary surgeon**;
* **follow** the established **protocol** for the procedure;
* **wear all personal protective equipment** provided by the Responsible Person where applicable to the procedure;
* **wear a personal radiation monitoring device** where provided by the Responsible Person;
* record and **report all incidents** or equipment malfunctions to the Responsible Person;
* ensure that the radiation **exposure of persons is minimised**; and
* in the case of **radiopharmaceutical therapy**, e.g. for the treatment of hyperthyroidism in cats, ensure that:
  + the radiation treatment plan has been approved by the veterinary surgeon; and
  + there is a continuous oversight of the radiopharmaceutical during the radiation dose delivery.

## Types of radiation sources and tasks performed

In this section list all radiation sources at this practice including all relevant details such as serial numbers, registrations numbers, or maximum quantity and activity of radioactive material.

At this practice general fixed and portable x-ray apparatus, and Iodine-131 therapy capsules are used. A complete list of apparatus is included at Appendix B .

Include a brief description of the tasks carried out which involve radiation sources below.  
  
e.g.

At this practice we perform veterinary:

* diagnostic or interventional radiology of small animals;
* diagnostic or interventional radiology of large animals;
* mobile radiology (e.g. site visit);
* veterinary screening investigations for equine yearling sales; and
* nuclear medicine procedures restricted to radiopharmaceutical therapy.

## Hazards associated with the radiation

In this section detail the risks associated with each piece of equipment and each task listed above, including during routine operations and non-routine or potential incidents.   
  
e.g.

**Task:** Diagnostic Radiology of small animals using X-ray Apparatus

**Risk:** Exposure to radiation from: the primary X-ray beam; scattered radiation; and tube head leakage.

**Description:** This hazard is present in Vet surgeries and adjacent rooms. For field radiography the area within the primary beam out to about 10 metres plus the area within about two to three metres around X-ray tube.

**Controls:** Follow procedure as outlined below.

**Task:** Iodine-131 therapy for the treatment of hyperthyroidism in cats

**Risk:** Exposure to radiation from: the radionuclide capsule prior to administration, and the cat and their waste following administration of the radionuclide.

**Description:** This hazard is present in Vet surgeries and adjacent rooms, in cat accommodation and waste disposal areas, and at home following release from the practice.

**Controls:** Follow procedure as outlined below.

# Procedures and Controls

## Strategies for limitation and minimisation of dose

In this section include general requirements which are employed to reduce the doses received by persons. This may include personal protective equipment and or radiation shielding.   
  
This section should include the dose of radiation that is anticipated to be received by a person while the radiation principles and work practices outlined in this document are being followed.

e.g. veterinary surgeons and assistants are expected to receive an average annual dose of less than 200µSv.

All **equipment is maintained and serviced** on a regular basis by appropriately licensed persons.

For fixed equipment, shielding will be confirmed by a **radiation shielding report** which is submitted to the Radiation Council via HPS as part of the **initial** radiation source **registration, and a radiation shielded position will be provided for the operator**.

### For staff and the general public

All staff must **follow the procedures** outlined in section 3.2 (Specific procedures).

No procedure shall take place unless it has been approved, justified, and the radiation exposure optimised by a Veterinary Surgeon who holds a current ACT Radiation Licence which includes such types of exposure.

### Other classes of exposed persons

When a member of staff becomes aware that she is **pregnant** she **should notify the responsible person** as soon as practicable.

The Responsible Person will, if necessary, **adapt the working conditions** of the pregnant member of staff so as to ensure that the embryo or foetus is afforded the same level of protection as that of a member of the public (less than 1 mSv per year).

Any person **under the age of 18** will be afforded the same level of protection as that of a member of the public (less than 1 mSv per year).

Pregnant women and persons under 18 are **not to hold animals during radiographic procedures**.

## Specific procedures

### Operator procedures

Immediately before conducting a radiation procedure on an animal, the operator must take reasonable steps to ensure that the **animal is correctly identified** and ensure that the specified or prescribed procedure is to be performed on the animal.

Detail how this is achieved at this practice.

The operator will ensure that **no person is in the imaging, administration or treatment area during a radiation exposure** or the administration of a radioactive material to an animal unless that person is required to be in attendance.

The operator of radiation-producing equipment or equipment containing radioactive source(s) will ensure that **no safety interlock devices are bypassed** at any time during routine use of the equipment.

**All assistants must remain behind protective barrier or screens**. Where there is no protective screen, i.e. when working out ‘in the field’, assistants must wear protective clothing and position themselves as far as practicable from the X-ray tube assembly, the animal and the path of the primary X-ray beam. Assistants should not routinely be required to hold patients during radiographic procedures and other methods of restraint or sedation should be employed.

The operator will be able to **observe the animal** (directly, in a mirror or via video) throughout procedures where the dosimetry or image quality could be affected by movement of the animal.

If the operator experiences **any fault, error, damage** or unusual operating behaviour of equipment or system they must:

* **immediately cease using** (e.g. switch off/unplug) the equipment or apparatus until the fault, error or unusual operating behaviour is rectified;
* **record the details** of the fault, error or unusual operating behaviour; and
* where the fault could compromise safety, diagnosis or treatment, **report it to** the **Responsible Person** and the **veterinary surgeon** where applicable.

The following safety devices and ancillary equipment shall be used:

* restraints for animals;
* mobile radiation screen, positioned a minimum of 2 metres from the animal and the X-ray tube, and of adequate size to protect the full height and width of the operator.

### Procedures for diagnostic radiography

The operator will ensure that, for radiography procedures:

* The primary **X-ray beam is restricted to the area to be examined** by means of the collimator or light beam diaphragm.
* Cassette or DR plate holders are used whenever a cassette or DR plate cannot be independently supported on a table, on the ground or on another support.
* Any person supporting a cassette or DR plate holder remains as far as practicable, preferably at least 1 metre, from the edge of the primary beam.
* **No part of any person**, even if shielded by protective clothing, is **exposed to the primary X-ray beam**.

The operator must ensure that **persons under the age of 18 years do not hold animals** during radiography and a notice to this effect is displayed prominently in the X-ray area.

The operator must ensure that the holding of animals during radiography is only carried out in rare circumstances, and does not become the normal procedure.

This section should reference practice specific procedures or include information that ensures that diagnostic radiography is only carried out in accordance with the relevant sections of Schedule B of the Vet Code.

E.g.

The practice procedure manual is attached at Appendix C, and is also available in the radiography room.

[or - Include information to satisfy all points listed in Schedule B of the Vet Code]

### Mobile and portable equipment

No Mobile equipment is used at this practice.  
  
 or  
  
 This section should reference practice specific procedures or include information that ensures Mobile equipment is used and stored safely.

E.g.

Mobile and portable radiation sources will only be used by persons who are appropriately trained and licensed. Wherever practicable portable equipment will be mounted on a tripod and operated remotely. When not in use the source will be stored insert storage location (and security arrangements) which is securely locked when not in operation.

### Fluoroscopic procedures

No Fluoroscopic procedures are carried out at this practice.   
  
or  
  
This section should reference practice specific procedures or include information that ensures that **Fluoroscopy** is only carried in accordance with **sections B1, B6 and B7** of Schedule B of the Vet Code.

### Nuclear medicine procedures

No Nuclear Medicine procedures are carried out at this practice.  
  
or   
  
This section should reference practice specific procedures or include information that ensures that **Nuclear medicine** is only carried out in accordance with the relevant sections of Schedule C of the Vet Code. This includes procedures to ensure the **isolation of an animal** undergoing treatment with **unsealed radioactive material**

Specific authorisations are required from the Radiation Council for the treatment of hyperthyroidism in cats. This practice and [vet name] have the necessary authorisations, and special safety measures are used as follows for the storage/use and cleaning up of waste.

### Information about animals containing radioactive material for owners and handlers

Where an animal is discharged while undergoing treatment with radiopharmaceuticals, or an implanted radioactive source, written information and instruction will be provided to the animal’s owner or handler. This written information and instruction is given to the owner or handler before the animal leaves the practice, and it addresses:

* the risks associated with ionizing radiation exposure to handlers and other persons;
* how to restrict exposures to persons which could result from proximity to the animal or their waste, if relevant;
* prevention of contamination, if relevant; and
* procedures in the event of contamination.

For I-131 treatment the advice must include:

* Instructions to avoid long periods (more than a few minutes) in close proximity to the cat, particularly during the first week.
* Information that it is safe to pick up the cat for short periods but that it should not sit on any person’s lap for extended periods or sleep next to any person on a bed.
* instructions that if the cat:
  + urinates inside a dwelling, the urine should be cleaned up thoroughly with paper towels which are then placed in a rubbish bag, or
  + vomits inside a dwelling, the vomit should be cleaned up thoroughly with paper towels which are then placed in a rubbish bag.
* Instructions that the cat should only be handled in well ventilated areas during this period.
* Instructions to wear rubber gloves when cleaning up urine and to wash hands thoroughly afterwards.
* Instructions that if the urine has soaked into garments or carpets, they should be cleaned thoroughly.

This written information is stored at the practice location of information and attached at Appendix D.

The following procedure is in place in the event of the death of an animal with radioactive material above the relevant activity exemption level in situ, which ensure that exposure to radiation of any person handling the corpse is minimised:

This section should reference practice specific procedures or include information that ensures that in the event of the death of an animal with radioactive material above the relevant activity exemption level in situ.

E.g.

* the level of activity of unsealed radioactive material remaining in the corpse is calculated and documented; and
* where unsealed radioactive material remains in the body, written instructions regarding handling and safety are provided to each person who handles the corpse.

### Procedures Involving Radiotherapy Apparatus

No Radiotherapy procedures are carried out at this practice.  
  
or

### Other Procedures Involving Radiation (including non-ionising radiation)

This section should reference practice specific procedures or include information that ensures that **Laser procedures** are only carried out in accordance with **Schedule E** of the Vet Code.

## Awareness

**Each access point** (e.g. door) into a radiation area has a **visible warning sign** or device to indicate that the room contains an ionizing radiation hazard.

A **notice** will be displayed prominently in the X-ray area informing that anyone under the age of 18 years is not to hold animals during radiography.

Any room containing fixed radiation-producing equipment will have a radiation warning sign displaying the **illuminated words** ‘IONIZING RADIATION – DO NOT ENTER’ (or equivalent) directly adjacent to any entry point of entry, unless an exemption is given by the Radiation Council on the grounds that the operator can control access to the only entry to the room.

The illuminated sign illuminates as the radiation-producing equipment is placed in the preparation mode prior to exposure and continues to illuminate during the exposure.

Detail or reference any additional awareness measures here.

## Personal Radiation Monitoring

A **Personal Dosimeter,** such as an electronic personal dosimeter (EPD), or a TLD or OSL badge, is **provided to each occupationally exposed person** who:

* is involved with the use of portable hand-held radiography;
* is involved in radiography **of large animals;**
* is likely to be exposed to radiation from radioactive sources used in veterinary medicine; or
* is likely to be exposed to ionizing radiation in excess of **1 mSv** in any one year.

The personal monitoring devices provided to each person must be capable of measuring the type of radiation emitted by the veterinary radiation equipment or radioactive source being used.

**A record is kept** of the radiation doses received by each occupationally exposed person in accordance with the requirements of RPS C-1.

### Details of Personal Monitoring

Detail or reference the methods of monitoring and recording of radiation sources and doses to workers. Include monitoring details (name of approved supplier etc.) and frequency of monitoring.

e.g.

At this practice all veterinary surgeons, nurses and assistants will be issued with a 3 monthly TLD or OSL Badge issued by Insert name and contact details of personal radiation monitor service.

Records of badge readings will be kept with personnel files in accordance with the requirements of RPS C-1, and results will be communicated to all wearers. Abnormally high readings will be investigated and reported where necessary.

## Training

The Responsible Person will ensure that **each person who may be occupationally exposed** to ionizing radiation has undergone training or instruction that relates to:

* the type of work being undertaken;
* the radiation source, and related ancillary equipment that the individual may be required to use;
* any potential radiation hazards associated with the practice;
* the means of protection from and minimisation of radiation exposure; and
* requirements for complying with the Radiation Management Plan.

Detail the training and information to be provided to persons involved in carrying out the radiation practice (all workers, patients and members of the public who may come into contact with radioactive sources). Include details of initial training/qualifications and ongoing training requirements, training providers etc.

## Equipment Safety Requirements

This section shou**ld** reference practice specific procedures or include information that ensures that **equipment** used for veterinary procedures meets the requirements the Vet Code. (e.g. **Diagnostic equipment** **section B4; radiographic B5; Fluoroscopic B7; Dental section B8;** etc.)

E.g.

Prior to being used, all equipment will be checked for compliance, by appropriately authorised people, against the requirements of the Vet Code and the Radiation Council. Equipment will be periodically retested to ensure that it continues to meet these standards.

## Expert advice

The following qualified expert is available on matters relating to radiation protection in veterinary medicine.

Insert the name and contact details of a qualified expert.

## Records management

The following records shall be kept:

A register of who has been **authorised to deal with a radiation source**.

Provide details here

e.g.

This register is kept in Appendix A of this plan.

A **source register** containing up to date information on the acquisition, relocation, replacement or disposal of all radiation-producing equipment or sealed radioactive sources, the maximum energy or dose rate of radiation sources, the maximum activity of each unsealed radionuclide possessed and used.

Provide details here

e.g.

This register is kept in Appendix B of this plan

For all **source disposals** the records should be kept of disposal information include details of its disposal and written confirmation from the organisation accepting responsibility for it (e.g. the disposal notice).

A **radiation incident** report register, containing all internal reports pertaining to radiation related incidents, and incident reports submitted to the Radiation Council via HPS.

Provide details here

e.g.

An electronic register will be kept on file at the practice

**Dose records** of the radiation doses received by each occupationally exposed person in accordance with the requirements of RPS C-1:

* + - * 1. during the working life of the occupationally exposed person
        2. afterwards for not less than 30 years after the last dose assessment
        3. at least until the occupationally exposed person reaches, or would have reached, the age of 75 years.

Provide details here

e.g.

An electronic register will be kept on file at the practice

**Maintenance and Service Log** of the each service or repair carried out on the radiation sources.

Provide details here

e.g.

An electronic register will be kept on file at the practice

Detail any other records which pertain to radiation sources and or exposure and how they shall be kept

## Transport

All transport of radioactive material will be conducted in accordance with the ARPANSA *Code for the Safe Transport of Radioactive Material (2019),* RPS C-2 (Rev. 1) and only by appropriately licensed persons.

Detail the transport requirements of your practice

## Storage

All radioactive material will be securely stored with adequate shielding to ensure no persons are exposed to a level above the occupationally allowed levels and exposures shall be kept as low as reasonably achievable.

Detail the storage requirements of your practice here

# Waste management

Where applicable, outline the program of disposal of radioactive waste which may be produced in the operation.

* Sources and categorisation of radioactive waste
* Mixed waste hazards
* Conditioning/packaging
* Storage of sources (adequate shielding and security)

Storage procedures for radioactive material waste (identification, location, record keeping, etc.)  
Disposal procedures (when, how, who authorises the disposal, Licence to Dispose etc.)

# Non-routine operation

In this section reference or detail any procedures are designed to minimise the radiation hazard arising from activities other than those required for normal operations. This includes servicing, maintenance, accidents and radiation incidents.

## Doses exceeding constraints

Where any personal monitoring results indicate a dose in any three month period of more than: 200 µSv for persons involved with diagnostic imaging of animals; or 1mSv for persons involved with nuclear medicine and/or radiation therapy of animals the Responsible Person will investigate and review practices. If the annual exposure of any person is greater than 1 mSv for a member of public, or 20mSv for an occupational dose the responsible person must submit a radiation incident report to the Radiation Council via HPS.

## Radiation incidents

Any staff member who becomes aware of an incident must ensure that the **incident is reported to** the **veterinary surgeon** and the **Responsible** **Person** as soon as practicable and within 24 hours.

Contact the Responsible person on Insert phone number here

**In the event of a radiation incident**, the Responsible Person will:

* ensure that the radiation incident is **investigated**;
* **submit a written report** of all reportable radiation incidents, including the preventative action to avoid a recurrence, to the Health Protection Service within 7 days. The radiation incident form available at [www.health.act.gov.au/businesses/radiation‑safety](http://www.health.act.gov.au/businesses/radiationsafety) should be used;
* in the case of a radiation source that is (or is suspected to be) **lost or stolen, immediately report** the event to the Health Protection Service on (02) 5124 9700;
* ensure an **internal report** on each radiation incident is written and kept in the institution’s radiation incident report register; and
* ensure that measures are implemented so that the possibility of the **recurrence** of the radiation incident investigated is **minimised**.

Reportable incidents include:

* incidents that cause or may lead to **radiation injuries** **or** radiation doses **exceeding** the annual **dose limits** to workers or members of the public;
* **lost or stolen** radioactive sources or radiation apparatus;
* **transport** of radioactive material (which is lost, damaged, or without required documentation or labelling);
* unintentional or unauthorised **discharges** of radioactive materials into the environment;
* **damage** to, or malfunctioning of, a radiation apparatus or sealed source apparatus;
* **contamination** with, or dispersal of, a radioactive material;
* out-of-control source of radiation (e.g. source not safely secured or shielded); and
* non-ionizing radiation **injury (or the potential for injury)** resulting from lasers, radiofrequency generating equipment, man-made sources of ultraviolet radiation, or magnetic resonance imaging machines.

More information may be obtained in schedule 13 of the *National Directory for Radiation Protection, June 2017* (RPS 6).

## Storage, disposal, repair or replacement of radiation sources

The Responsible Person will **advise the Health Protection Service** of the **receipt or disposal** of any radiation-producing equipment or sealed radioactive source. This needs to be done **within 7 days**. The appropriate forms (Notification of disposal, Notification of Service, or new source registration application) are available from [www.health.act.gov.au/businesses/radiation-safety](http://www.health.act.gov.au/radiation-safety) .

All repair and servicing will be performed by persons who hold an **appropriate Radiation Licence**.

In this section detail any additional procedures for:

* Repair/Service (when, who repairs radiation sources)
* Disposal of radioactive material (when, how, who authorises the disposal, regulatory Licence and conditions, etc.)
* Replacement for sources containing Radioactive material (End of working life, replacement, etc.)

# Definitions and related documents

## Documents

*Radiation Protection Act 2006*

*Radiation Protection Regulation 2007*

ARPANSA Codes of practice (available from [www.arpansa.gov.au/Publications/codes/rps.cfm](http://www.arpansa.gov.au/Publications/codes/rps.cfm)):

**RPS C-1** *Code for Radiation Protection in Planned Exposure Situations (2016)* (RPS C-1)

**RPS C-2** *Code for the Safe Transport of Radioactive Material (2019),* RPS C-2 (Rev. 1)

**RPS 6** *National Directory for Radiation Protection, June 2017* (NDRP)

**RPS 17** *Code of Practice for Radiation Protection in Veterinary Medicine (2009)* (the Vet Code)

List any practice specific procedures here.

## Dictionary

|  |  |
| --- | --- |
| **HPS** | Health Protection Service |
| **Mobile** | Equipment is considered to be mobile if it is on wheels and is not designed to be carried by hand. |
| **OSL** | Optically Stimulated Luminescence (dosimeter) |
| **Operator** | Any natural person who is authorised by the relevant regulatory authority to administer radiation to an animal for radiology, nuclear medicine or radiotherapy. |
| **Portable** | Equipment is considered portable if it is designed to be carried by hand. Portable equipment should be fixed to a stand prior to use, to ensure that it remains stationary during exposures. |
| **Qualified expert** | A person who:  (a) is qualified in the application of the physics of therapeutic or diagnostic uses of ionizing radiation; and  (b) has been recognised by the relevant regulatory authority as being able to perform the dosimetric calculations, radiation measurements and monitoring relevant to the person’s area of expertise. |
| **Radiation Incident** | Any unintended or ill-advised event when using ionizing radiation apparatus, specified types of non-ionizing radiation apparatus or radioactive substances, which results in, or has the potential to result in, an exposure to radiation to any person or the environment, outside the range of that normally expected for a particular practice, including events resulting from operator error, equipment failure, or the failure of management systems that warranted investigation. |
| **Responsible Person** | In relation to any radioactive source, radiation-producing equipment, prescribed radiation facility or premises on which radioactive sources are stored or used means the legal person:   1. having overall management responsibility including responsibility for the security and maintenance of the source, radiation-producing equipment, facility or premises; 2. having overall control over who may use the source, radiation-producing equipment, facility or premises; and 3. in whose name the source, radiation-producing equipment, facility or premises would be registered if this is required. |
| **RMP** | Radiation Management Plan |
| **RSO** | The Radiation Safety Officer is responsible for recommending or approving corrective actions, identifying radiation safety problems, initiating action, and ensuring compliance with regulations. |
| **TLD** | Thermo-Luminescent Dosimeter (replaced by OSL dosimeters) |
| **X-ray equipment** | Any equipment that produces ionizing radiation when energized. |

APPENDICES

1. List of persons dealing with Radiation Sources

The following **people deal with radiation sources** at this practice:

Include In this section all other personnel who are likely to deal with a radiation source at Include Licence Numbers where appropriate.

| **Person** | **Position** | **Licence/ Authorisation** | **Permitted source types** | **Expiry date** |
| --- | --- | --- | --- | --- |
| John Smith | Owner / Responsible Person | RS99/145 |  |  |
| Steve Citizen | Veterinary Surgeon | 14/000452 |  |  |
| Frank Stevens | Veterinary Nurse | 11/000045 |  |  |
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1. List of Radiation Sources

In this section list all radiation sources at this practice including all relevant details such as serial numbers, registrations numbers, or maximum quantity and activity of radioactive material.

The following sources are handled under this Radiation Management Plan:

| **Registration Number** | **Source Location** | **Source type** | **Manufacturer/**  **Model** | **Serial Numbers** | **Expiry date** |
| --- | --- | --- | --- | --- | --- |
| RS02/145 | Surgery 1 | General X-ray | GE radiographio | 455455, 4455564 |  |
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1. Practice Procedure Manual
2. Information about animals containing radioactive material for owners and handlers