

## IONISING RADIATION (OPEN SOURCES) POLICY AND MANAGEMENT SYSTEM

Date	Purpose of Issue / Description of Change	Equality Impact Assessment Completed
1 <sup>st</sup> April 2010	Initial Issue	
June 2012	Rev37304 Tf1 0 0 1 297.652 Tf1 0 0	









The drawing up of contingency plans.

Dose assessments and required records.

#### Radiation Waste Adviser (RWA)

The Environmental Permitting Regulations require the permit holder to consult a Radioactive Waste Adviser on the following matters and have due regard to the advice provided by the Radioactive Waste Adviser:

Achieving and maintaining an optimal level of protection of the environment and the population.

Checking the effectiveness of technical devices for protecting the environment and the population.

Acceptance into service, from the point of view of surveillance of radiation protection, or equipment and procedures for measuring and assessing, as appropriate, exposure and radioactive contamination of the environment and the population.

Regular calibration of measuring instruments and regular checking that they are serviceable and correctly used.

#### Radiation Protection Officer (RPO)

To ensure the requirements of the Ionising Radiation Regulations and the Environmental Permitting Regulations are met, the University has appointed a Radiation Protection Officer (RPO) to provide guidance and support. In addition, the RPO will provide support and co-ordinate with both the RPA and the RPS's with regards to ionising radiation issues. Responsibilities include:

Managing the radiation database.

Ensuring all radiation workers receive appropriate training before undertaking any radiation work.

Appointing a sufficient number of local RPS' with training provided as required.

Ensuring suitable Local Rules and risk assessments are produced.

Monitoring radiation areas to ensure Local Rules, Risk Assessments and safe working practices are followed.

Coordinating the work required to upgrade / commission / de-commission radiation laboratory facilities.

Provide advice and guidance to Campus Services, Colleges and Professional Services if impacted by radiation work.

Provide advice and guidance to the Radiation Health and Safety Sub-Committee and University Health and Safety Committee, as appropriate.

Liaising with Natural Resources Wales, the Health and Safety Executive and other relevant bodies on behalf of the University.

Ensuring all accidents and incidents associated with radiation work are reported to Health and Safety, the RPA and other Regulatory Authorities as required with the subsequent investigation appropriate to the nature of the incident.



method and Local Rules training and maintain a record of this. The RPO / RPA will periodically audit the RPS's training methods.

#### RPO

The RPO will be required to attend the RPS training course and specific training provided by the RPA. Additional / refresher training will then be arranged as advised by the RPA.

#### RPS(s)

Prior to appointment, all RPS's will be required to attend a 1 day site based RPS training course run by the RPA. Refresher training will be provided as required by the RPA.

#### Maintenance Engineers/Campus Services Maintenance Staff

The local RPS will provide job awareness training that covers the hazards and risks to maintenance engineers and Campus Services maintenance staff before they are permitted access, under direct supervision to radiological areas. In addition, the RPO will provide Laboratory Awareness training to relevant maintenance staff at the request of Campus Services.

#### Records of Training

The RPA will be responsible for maintaining records of RPO and RPS training. The RPO will maintain records of Radiation4(ill )-83(b5)( R)-400.000008871 0 595.32 842u(O(P)-2(S 2 Tf1 0 0 1 196.37 616.9 Tm0 G(/)-12





## Monitoring



BANGOR UNIVERSITY  
IONISING RADIATION  
(OPEN SOURCES)  
MANAGEMENT SYSTEM

## 1. STATEMENT ON BEST AVAILABLE TECHNIQUE (BAT)

The University's Natural Resources Wales (NRW) authorisations (Permits) to accumulate and dispose of radioactive waste issued under the Environmental Permitting Regulations requires the use of BAT. As such the University will implement systems to:

### Operating Techniques

- i. Use alternative materials, other than radioactive sources where possible.
- ii. Minimise the

### 1.1 Justification and Optimisation of the Use of Radioactive Material

Researchers in the School of Natural Sciences and School of Ocean Sciences (all part of the College of Environmental Sciences and Engineering) periodically conduct biological research involving the use of radio labelled compounds. This research is essential in the understanding of biological systems at the ecosystem, organism and cellular level.

Levels of radioactivity will be selected which are as low as possible, but still allow detection of metabolites and residues in the test systems. The radioactive material used in experiments will be kept as low as possible, in order to reduce the amount of waste produced.

### 1.2 Assessment to demonstrate Optimisation of Radiation Waste Production and Disposal Procedures

Waste is generated from plant, fish, soil and other biological research. A significant amount of the radioactivity used in this research is associated with activity balance work where known amounts of radioactivity are administered to test systems, e.g. soil is routinely collected and analysed to check overall recovery of radioactivity.

2) <sup>3</sup>H - School of Ocean Sciences (SOS) and School of Natural Sciences (SNS)

Tritium has for some time been used to measure the rates of protein synthesis in fish and the techniques have now been extended to a range of different animals including crustaceans and mollusks. In addition, the range of fish species and sizes studied has also been increased. Techniques have been refined to reduce the amounts of radioactivity used and wastes arising. More of the radiolabel is now incorporated into test animals (previous estimates indicated up to 95% of injected label leached out and was disposed of as aqueous waste) allowing substantial reductions in the amounts of radioactivity required to

item limit of 400 kBq. Carbon dioxide given off as a product of respiration is chemically trapped producing aqueous waste (5%) and because accumulation of aqueous <sup>33</sup>P and <sup>14</sup>C waste is not authorised and there are significant negative health and safety implications for solidification of this waste, all aqueous waste is disposed of immediately to drains via a





### 1.3 Source Acquisition

- 1) The University's registration limits are apportioned between research groups / laboratories such that if the maximum activity is held within each research group / laboratories then the license limit is not exceeded.
- 2) The RPS will ensure minimal quantities of radioactivity are ordered, to cover use in experiments.
- 3) Only the relevant RPS may order a new unsealed source; the RPO is notified when the source is ordered.
- 4) The RPSs maintain current lists of unsealed sources held in their radiation work area / School / Professional Service.

### 1.4 Storage

- 1) All radiochemical stocks are stored in designated laboratories only.
- 2) Access to these laboratories is restricted to authorised radiation workers only.
- 3) Shielded containers are used for hard beta and gamma sources.
- 4) All primary and secondary stock containers, and, wherever practicable samples, holding radioactive material will be marked with the word 'Radioactive', a trefoil symbol and other information necessary for the identification of the material presents. Exceptions where this trefoil and wording is not deemed practicable is for very small and / or very numerous sample tubes in which case the rack / box containing them should be labeled with a trefoil and the word 'Radioactive'.
- 5) All waste receptacles shall be labeled with the word 'Radioactive' and a trefoil, wherever practicable.
- 6)



