



## DRINKING WATER INSPECTORATE

Area 7E, 9 Millbank  
c/o Nobel House  
17 Smith Square  
London SW1P 3JR

Enquiries: 030 0068 6400

E-mail: [dwi.enquiries@defra.gsi.gov.uk](mailto:dwi.enquiries@defra.gsi.gov.uk)

DWI Website: <http://www.dwi.gov.uk>

12 October 2015

Information Letter 05/2015

### **To: Board Level and Day to Day Contacts of Water and Sewerage Companies, Water Companies and Environmental Health contacts of local authorities in England and Wales**

Dear Sir or Madam

### **PUBLICATION OF RESEARCH: UNDERSTANDING THE IMPLICATIONS OF THE EUROPEAN REQUIREMENTS RELATING TO RADON IN DRINKING WATER**

#### **Background**

1. The Euratom Directive 2013/51 sets out specific requirements in relation to radon in drinking waters that include:

- Establishing a parametric value to be set for radon between 100 Bq/l and 1,000 Bq/l.
- Investigation of any concentration exceeding the parametric value; if the supply is considered a potential risk to human health, remedial action must be taken to protect consumers.
- Immediate remedial action must be taken where concentrations above 1,000 Bq/l occur.
- Conducting a representative survey to determine scale and nature of likely exposure to radon in water supplies.
- Where the survey demonstrates a risk that a supply is likely to exceed the parametric value, monitoring must be carried out.

2. The DWI is in the process of revising the public and private drinking water quality regulations to transpose the requirements of the Euratom Directive. To inform this revision to the regulations, DWI commissioned a research project to assess the implications for the UK of the Euratom Directive relating to radon in drinking water. Results of this research are now available.

## Purpose

3. The purpose of this letter is to inform you of:

a) the publication of the DWI research on radon on the DWI website at <http://www.dwi.gov.uk/research/completed-research/reports/DWI70-2-301.pdf>

and

b) interim advice that water companies and local authorities should consider in relation to risk assessment and future monitoring requirements of their water supplies in respect of radon.

## Findings of the research

4. There is relatively limited data on radon in drinking water supplies. The data that are available show if radon is present it is generally at low concentrations. The lowest concentrations are generally observed in large public water supplies especially those derived from surface sources and areas where indoor radon levels in air are low. The highest concentrations of radon in water tend to occur in smaller, mainly private water supplies obtained from ground water sources in areas where levels of radon in air are most likely to be high.

5. Other key conclusions are set out in the bullets below:

- A parametric value for radon of 100 Bq/l is appropriate to adopt to support further investigation, with a concentration of 1,000 Bq/l being set as a value above which remedial action should be taken without further consideration.
- A radon hazard identification approach should be adopted for both public and private water supplies using hydrogeological and radon-related geological information together with existing measurements of radon in water.
- A number of analytical methods exist for the determination of the activity concentration of radon in drinking water. All these methods are capable of meeting the performance characteristic described in the new regulations of 10 Bq L<sup>-1</sup>. (see section 7 of the report for further details of analytical and sampling methods).
- Regardless of which method is selected, all collection and measurement systems should be included within an ISO 17025 accredited system which also conforms to the Drinking Water Testing Specification.

6. One of the main outputs of the research report is radon in water risk maps for England and Wales, Scotland and Northern Ireland. These maps were produced using the limited available data on measurements of radon in drinking water supplies, combined with hydrogeological mapping to assess radon hazard.

7. The maps set out three levels of categorisation. Areas of High hazard are those where existing measurements of radon in water and supporting scientific evidence suggest that elevated concentrations are more likely to occur. Areas with Low hazard are those where evidence suggests that significantly elevated concentrations of radon in water are not expected. Moderate hazard areas are those where there is some evidence to suggest that significantly elevated radon levels may occur in water sources, but the prevalence and distribution of concentrations is expected to be lower than areas of High hazard but there is insufficient evidence to support assignment to other hazard categories.

### **Recommendations of the research**

8. For public and private water supplies considered to be in the moderate and high hazard areas, appropriate monitoring should be undertaken to identify where significant elevated concentrations of radon occur in water supplies that might require action to reduce concentrations.

9. In Low hazard areas, monitoring of radon in drinking water sources is considered not to be necessary for the purposes of identifying water sources that might require action.

10. Surface water sources are unlikely to have significantly elevated radon concentrations, irrespective of the local hazard band, and therefore, monitoring of radon in such sources is considered not to be necessary for the purposes of identifying water sources that might require action.

11. For private water supplies, the possible presence of levels of radon can be indicated with a standard radon-in-air measurement. Most of the homes with a private water supply in High and Moderate hazard areas, where the highest levels of radon in water are expected, are in 1 km grid squares that contain radon affected areas – these areas can be identified in published radon indicative atlases that are already available on the UKradon.org website. Radon testing is already advised in radon affected areas. Therefore existing PHE advice to test for radon in air can also support the identification of homes that might have high indoor radon levels arising from a private water supply in these areas.

### **Action to be taken by water companies and local authorities**

12. Although the outcome of the research has provided information on risk of radon in water supplies, further monitoring is required for those supplies in high and moderate hazard areas. Water suppliers and local authorities should use the radon hazard maps set out in the research report along with any other relevant information including where available existing measurements of radon in water, to identify which of their supplies are in geographical areas where the hazard is assessed to be Low, Moderate or High.

13. Once a supply has been assigned a risk category, monitoring should be undertaken as follows:

- No monitoring of surface water supplies is required;
- No monitoring of groundwater supplies in the Low hazard areas is required;
- Public groundwater supplies in the High and Moderate hazard areas should be monitored from 1<sup>st</sup> January 2016 at the audit frequency specified in the current regulations (schedule 3 table 3) until the end of 2016; after which, a further review should be carried out to assess whether any further regulatory monitoring is required;
- For private water groundwater supplies in High and Moderate hazard areas, before any monitoring of water is carried out, consideration should be given to carrying out a radon-in-air test within a property supplied. If the test result exceeds 200 Bq/m<sup>3</sup>, analysis of a sample of the private water supply should be carried out to confirm whether the supply is the source of the radon in air. A radon in air test however, is not advised if the building has radon mitigation in place since any air measurement is unlikely to reflect the water concentration;
- No monitoring of private supplies to single domestic dwellings not used for commercial purposes is required unless the authority is requested by the owner or occupier or the authority considers it is necessary to fulfil its general duty under section 77 of the Water Industry Act.
- For public water supplies, monitoring can be carried out at supply points.

14. Companies (and local authorities) will need to put in place arrangements for sampling and analysis where they do not have the capabilities to do so themselves and should ensure where possible that those provisions meet the requirements set out at paragraph 5 above.

15. Further advice on risk assessment and future monitoring including the information requirements for a notice not to monitor will be provided once new regulations are in place setting out the Euratom requirements.

16. An UKWIR project has commenced focussing on a programme of sampling and analysis of those supplies categorised by the research report in the Moderate and High hazard areas. This will help to validate the research findings; however, this work is not due to complete until the end of 2015 and therefore, is unlikely to assist with further refinement of the risk categorisation until after early in 2016.

## Enquiries

17. Any enquiries regarding public supplies letter should be made to Dr Peter Marsden at [peter.marsden@defra.gsi.gov.uk](mailto:peter.marsden@defra.gsi.gov.uk) and any enquiries regarding private supplies to Laura Moss at [laura.moss@defra.gsi.gov.uk](mailto:laura.moss@defra.gsi.gov.uk)

18. Copies of this letter are being sent to Pamela Taylor, Chief Executive, Water UK; Carol Skilling, Water Resources Management, Department for Environment, Food and Rural Affairs; Paul Harrison, Water Management Team, Welsh Government; Sue Petch, Drinking Water Quality Regulator for Scotland; David O'Neill, Drinking Water Inspectorate for Northern Ireland;

Tony Smith and Chairs of the Regional Consumer Council for Water; Clair Daniel, Ofwat; Paul Hickey, Environment Agency; Liz Stretton, Food Standards Agency; and Frances Pollitt at Public Health England.

Yours faithfully

A handwritten signature in black ink that reads "Pollard". The signature is written in a cursive style with a large initial 'P'.

Claire Pollard  
Deputy Chief Inspector (Science and Strategy)