Explanatory Memorandum to *the Private Water Supplies (Wales) (Amendment) Regulations 2016.*

This Explanatory Memorandum has been prepared by the *Economy, Skills and Natural Resources department* and is laid before the National Assembly for Wales in conjunction with the above subordinate legislation and in accordance with Standing Order 27.1

Minister's Declaration

In my view, this Explanatory Memorandum gives a fair and reasonable view of the expected impact of the Private Water Supplies (Wales) (Amendment) Regulations 2016. I am satisfied that the benefits justify the likely costs.

Carl Sargeant AM
Minister for Natural Resources

23 March 2016

1. Description

The Private Water Supply (Wales) (Amendment) Regulations 2016 will amend the Private Water Supply (Wales) Regulations 2010 to transpose the requirements of Council Directive 2013/51/Euratom laying down requirements for the protection of the health of the general public with regard to radioactive substances in water intended for human consumption ("the Directive").

The Regulations introduce new requirements for local authorities to monitor for radioactive substances in private water supplies as required by Article 6 and Annexes I, II and III of the Directive. These mainly focus on monitoring for radon, but will also cover Indicative Dose (ID) and tritium.

2. Matters of special interest to the Constitutional and Legislative Affairs Committee

Paragraph 3 of this Memorandum explains that these Regulations are made partly in reliance on section 2(2) of the European Communities Act 1972. By virtue of section 59(3) of the Government of Wales Act 2006 ("GoWA 2006"), the Welsh Ministers are to determine whether an instrument made in exercise of the section 2(2) powers is to be subject to the negative or affirmative procedure.

As these Regulations are directly transposing the requirements of the Directive, the Welsh Ministers have determined that these Regulations are to be subject to the negative resolution procedure.

The transposition deadline for the Directive is 28 November 2015.

3. Legislative background

These Regulations are made by the Welsh Ministers in exercise of the powers conferred by—

(i) section 2(2) of the European Communities Act 1972 ("the 1972 Act"), in relation to the Welsh Ministers' designation in relation to the quality of water intended for domestic purpose or for use in a food production undertaking; and

(ii) sections 67, 77(3) & (4) and 213 of the Water Industry Act 1991 ("the 1991 Act").

Section 2(2) of the 1972 Act provides that Ministers may be designated to make provision for the purpose of implementing EU obligations, or for the purpose of dealing with matters arising out of or related to any such obligation. Section 59(1) of GoWA 2006 provides that section 2(2) may be used to designate the Welsh Ministers. The Welsh Ministers are designated for the purposes of section 2(2) of the 1972 Act in relation to the quality of water intended for domestic purposes or for use in food production undertaking. The National Assembly for Wales was originally designated by

means of The European Communities (Designation)(No 7) Order 2002 and those functions are now exercisable by the Welsh Ministers by virtue of section 162 of, and paragraphs 28 and 30 of Schedule 11 to GoWA 2006.

The relevant functions of the Secretary of State under the 1991 Act were transferred to the National Assembly for Wales by virtue of the National Assembly for Wales (Transfer of Functions) Order 1999 as follows—

- Functions under section 67 were transferred for
  a) the making of regulations concerning water supplied using the supply system of a water undertaker, in relation to the supply system of any water undertaker whose area is wholly or mainly in Wales; and
  b) the making of regulations concerning water supplied other than using the supply system of a water undertaker, in relation to Wales, by article 2 of, and Schedule 1 to the National Assembly for Wales (Transfer of Functions) Order 1999.
- Functions under section 77 were transferred in full.
- Functions under section 213 were transferred to the Assembly to the same extent as the powers, duties and other provisions to which that section applies were exercisable by the Assembly

The functions conferred on the National Assembly for Wales by the National Assembly for Wales (Transfer of Functions) Order 1999 are now exercisable by the Welsh Ministers by virtue of section 162 of, and paragraphs 28 and 30 of Schedule 11 to, GoWA 2006.

As outlined above, the Regulations are subject to the negative procedure.

4. Purpose & intended effect of the legislation

This instrument applies to Wales.

The objective of the Regulations is to include new EU requirement for monitoring of radioactivity in water.

The Council of the European Union adopted the Directive under the Euratom treaty on 22 October 2013.

The Directive sets out parametric values, and frequencies and performance characteristics for analytical methods for monitoring radioactive substances in water intended for human consumption. This includes water as defined in the scope of the Drinking Water Directive 98/83/EC for drinking, cooking, food preparation or other domestic purposes supplied from a distribution network, tanker or in bottles or containers. It also includes all water used in any food production undertaking for the manufacture, processing, preservation or marketing of products or substances intended for human consumption.

5. Consultation

The Regulations are a direct transposition of an EU Directive. The Directive requirements are very specific and do not give the Welsh Government discretion on how they can amend the regulations in terms of what the stakeholders must do. Due to these limitations a public consultation exercise has not been carried out, stakeholders have however been appropriately informed in advance of the changes to the Regulations in line with the requirements of article 9 of EC Regulation No. 178/2002.

PART 2 – REGULATORY IMPACT ASSESSMENT

Options

Option 1: Do nothing – make no amendments to the Private Water Supplies (Wales) Regulations 2010.

Option 2: Preferred option – transpose new requirements in Council Directive 2013/51/EURATOM8 ('Euratom Directive') by amending Private Water Supplies (Wales) Regulations 2010 to include testing for radon.

Costs & benefits

Option 1 (do nothing)

Costs
Wales could face infraction from the EU if the new requirements the Euratom Directive are not adhered to. Infraction would carry significant costs to the Member State. In this case, the UK Government would be fined and it is assumed that the costs would be passed on to the Welsh Government.

An applicable example of infraction occurred in 2012, involving Ireland's failure to regulate the installation and use of septic tanks. The European Court of Justice found that Ireland had failed to fulfil obligations on wastewater which is disposed of in septic tanks, threatening drinking water and putting human health at risk.

Ireland was fined a lump sum of €2m plus daily a charge of €12,000 until compliance was met. Ireland was also fined a further €1.5 million for failing to comply with other regulations regarding Environmental Impact Assessments (EIAs).

However, the EU executive wanted to fine higher amounts, seeking a lump sum of €5.5m and plus a daily penalty of over €26,000 for the septic tanks infringement. They also pressed for around €4.4 million over the EIA issue. The court had issued lower penalties because ability to pay was diminished due to the economic difficulties Ireland was facing at the time. Given that the relatively healthier economic conditions that currently prevail, fines might not be softened if infraction occurred now.

Although the infraction example for Ireland is not identical to the infraction Wales could face, the fines incurred by Ireland provide a proxy for the possible costs to Wales. In paying the fines, recipients of public services would be adversely affected as the fines would have to be paid from the public purse.

Benefits
There are no benefits identified with option 1.

Option 2 (preferred option)

According to the Drinking Water Inspectorate's (DWI) 2014 report on Private Water supplies there are an estimated 14,396 private water supplies in Wales, of which 1,110 are large supplies used for supplying public buildings or for commercial purposes, 1,035 used as small shared supplies, 9 private distribution systems and 12,242 are to single private dwellings.

In terms of hazard identification and characterisation, the two main pathways by which people can be exposed to radon from domestic water supplies are inhalation and ingestion. The main hazard following exposure to radon by inhalation is lung cancer. There is strong epidemiological evidence that inhalation of radon is a major cause of lung cancer with additional risks proportional to long term exposure. The ingestion of radon and its decay products results mainly in radiation dose to the stomach. When radon is present in a domestic water supply, it will lead to both exposure pathways.

Radon is measured in becquerels per cubic metre of air (Bq m-3) and per litre (Bq L^{-1}). The Euratom Directive sets criteria for radon in water in the permissible range of between 100 to 1,000Bq L^{-1}. Advice from the DWI's research on radon in the water supply suggests that radon in water at 1,000Bq L^{-1} increases concentration in indoor air by approximately 100Bq m-3. The current Action Level for radon in air in homes in the UK is 200 Bqm-3. The UK Committee on the Medical Aspects of Radiation in the Environment (COMARE) concluded that the risk to health from drinking water with 1,000 Bq L^{-1} of radon would be similar to the risk from exposure in air at the Action Level of 200 Bq m-3.

The DWI has advised that surface water sources are unlikely to have significantly elevated radon concentrations. Therefore, monitoring of radon in such sources is considered not to be necessary for the purposes of identifying water sources that might require action.

The DWI has advised local authorities to identify which of their supplies are in geographical areas where the hazard is assessed to be Low, Moderate or High. No monitoring is required in private water supplies in low hazard areas.

For private groundwater supplies in High and Moderate hazard areas the DWI have advised that the possible presence of levels of radon can be indicated with a standard radon in air measurement. Therefore the 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. If the tests exceeds 200 Bq m3, analysis of a sample of the private water supply should be carried out.

No monitoring of private supplies is required for single domestic dwellings not used for commercial purposes, unless the authority is requested to do so 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.

The radon hazard maps provided in the research report commissioned by the DWI indicate a relatively high concentration of high risk premises in mid Wales. Where there is available data on radon concentrations in some of these high risk areas the maximum levels were 110.1 and 105 Bq L^{-1}, which is somewhat below the hazardous limit of 1,000 Bq L^{-1}. However, these results come from a survey – there may in fact be some properties missed by the survey that could potentially contain harmful levels of radon in their water supply.

Nevertheless, the evidence available indicates that the likelihood of premises in Wales containing harmful levels of radon is low.

Costs

Compliance with the amendments to the current regulations would require private water supplies in moderate to high risk areas to be risk assessed through in air radon tests, potentially followed by sampling of relevant private water supplies where the air radon tests exceed 200 Bq m3 in various locations in Wales. Where a risk assessment is required, the costs of the assessment would be recouped by the local authorities from the business involved.

The affected businesses would primarily be located in rural areas as they are more likely to be serviced by private water suppliers. DWI research identified the following local authorities in Wales as potentially having a higher radon hazard, these authorities are:

- Powys
- Ceredigion
- Pembrokeshire
- Denbighshire
- Gwynedd

Risk assessment and monitoring

Monitoring of radon would be determined by whether the hazard for radon is assessed to be Low, Moderate or High. Local authorities should use the radon hazard maps alongside any other relevant information including available existing measurements of radon in water to identify which of their supplies are in Moderate to High hazard areas.

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

- No monitoring for surface water is required
- No monitoring for ground water in Low hazard areas is required
- No monitoring of private supplies to single domestic dwelling 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.
- Private water supplies in Moderate and High hazard areas should carry out radon in air tests within the property supplied
- Private supplies where the in air test exceeds 200 Bq m3 should carry out sampling analysis to confirm whether the water supply is the source of radon in air.

According to Public Health England a standard in air radon check and measurement costs £3.90 and £49.80 including VAT, respectively. The maximum number of air radon tests required in Wales according to available data on eligible private water supplies would be on 2,154 supplies (i.e. those supplying commercial and buildings, small shared supplies and private distribution systems). The maximum cost to private businesses in Wales for the initial checks would therefore be approximately £116,000. However, for the reasons outlined above, the cost is expected to be significantly lower. These initial checks will be carried out during 2016.

There are potential additional costs around further sampling analysis and remedial works, however, it is unclear at this stage what these costs will be, as they are dependant on the number (if any) of air radon tests exceeding 200 Bq m-3. These potential costs are discussed further below.

Sampling and analysis

At present local authorities are already required to carry out risk assessments on relevant private water supplies to establish whether there is a significant risk of supplying water that would constitute a potential danger to human health.

The Private Water Supplies (Wales) Regulations 2010 set the current maximum fees chargeable by the local authorities for a risk assessment for private water supplies at £500 with sampling costs of £100 per visit (analysis of samples can be anything from £25 to £500) and investigations contingent on a failed sample costing £100. The cost of radon risk assessment, sampling and testing sampling would be <u>additional</u> to these costs.

There are currently very few laboratories in the UK offering radon in water testing as a commercial service so there is no sensible cost comparison. Local Authorities have been informed that their sampling staff must be deemed competent to carry out sampling and transportation of samples through an accreditation system (IL 05/2013). The Drinking Water Inspectorate is working with the appointed accreditation service, UKAS, to develop a system for local authority staff. In the interim, local authorities are being advised to continue to follow best practice with regards to sampling and transportation with guidance and support from their local water companies. The Inspectorate plan to issue specific radon sampling guidance before the new Regulations come into force. Local authorities are required to use laboratories accredited to carry out the analysis in question. However there are only two laboratories (LGC and SWW) who are currently accredited for

radon analysis. In response to the implementation of the Euratom Directive, a number of other laboratories are working towards accreditation. Radon analysis of samples must be carried out within a specified time period after collection due to the short half-life of radon. Therefore in the interim local authorities should seek laboratories which carry out non-accredited radon analysis in preference to missing the timeframe for analysis by using more distant laboratories. Research commissioned by the DWI has estimated the costs for set up of three potential analytical methods which could be used **if** additional testing capacity were required (this will only be known once the initial testing is complete). These costs are detailed in table 1 below:

Table 1: Cost of Analytical Methods

Type of analysis method	**Field measurement of samples**	**Laboratory analysis: gamma spectrometry (GS)**	**Laboratory analysis: liquid scintillation spectrometry (LS)**
Cost to buy the equipment	£5,000-£7,000 cost of system to order	£70,000-£90,000 for gamma spectrometry system including shielding	£30,000-£50,000
Training costs	Comes with field manual so a technically competent member of staff would need a few days worth of training	New laboratory staff with no prior experience would need 6 months to a year's worth of accreditation training, if staff have experience in operating gamma specs or LS instruments then a few days	No data
Equipment set up	No data	Where there are suitable spectrometers that have not been used for this purpose before preparation of calibration curves would take a few of days for a small team of staff (on assumption that they are experienced)	No data
Accreditation	No data	Requirement to be accredited against IOS 17025 and Lab 37 standards validation cost for this is normally between £5,000 to £10,000	No data
Staff time	Field systems require 90-120 minutes of staff time per measurement	15 to 30 minutes of lab time to collect 1 sample, then 10 to 20 minutes per sample to operate the spectrometer	10 minutes per sample to prepare and operator of the spectrometer a few minutes per sample
Transportation	Analysis can be carried out in the	Multiple samples to be collected, sampling	Multiple samples to be collected, sampling

of the sample	field	container and seal must be material impervious to radon (glass or aluminium). Samples should be protected and held rigidly during transport with the temperature maintained during transport	container and seal must be material impervious to radon (glass or aluminium). Samples should be protected and held rigidly during transport with the temperature maintained during transport

Remedial works to premises

If radon is detected in the water supply then the cost of remedial work that is necessary to the remove the threat of radon would fall on affected businesses. This in turn would produce further costs if the business would have to shut down temporarily whilst remediation takes place.

Hodgson et al (2011) estimate that the cost to carry out remedial work to ensure radon levels in premises at between £200 and £1,000. If multiple properties are found to have a risk of radon, economies of scale would push down the cost of remediation. However, given the low probability of finding harmful levels of radon in Welsh private water supplies, significant economies of scale are unlikely to be present.

Cost of guidance for businesses

The DWI and/or the Welsh Government may need to issue supplementary guidance to businesses to outline the changes involved with complying with the Euratom Directive. There is currently no estimate available for what this cost might be.

Benefits

Public health benefits

There is strong evidence[1] to prove that long term exposure to an atmosphere containing radon increases the risk of lung cancer.

Inhalation and ingestion are the two main pathways by which people can be exposed to radon present in domestic water supplies. Radon can be released from water into the indoor air in normal household activities such as showering, washing dishes and cooking.

[1] Ricardo – AEA "Understanding the Implications of the EC's proposals Relating to Radon in Drinking Water for the UK: Final report, section 2 review of exposure and health implications. 2015

Lung cancer is the main hazard following exposure to radon by inhalation. This is supported by strong epidemiological evidence, which identifies additional risks arising from long term exposure.

Radiation dosages occur in the stomach when radon and its decay products are ingested, although the presence of radon in a domestic water supply can enter the body through both inhalation and ingestion.

The World Health Organisation (WHO) recognises that exposure from radon in water arises primarily from the release and inhalation and recommends that radon in water should be managed using the same criteria for managing radon in air.

Therefore there is possible public health benefits associated with compliance with the Euratom Directive. However, there are no estimated monetised health benefits identified with assessing the risk of harmful levels of radon in water.

Summary of the preferred option

Transposing the Euratom Directive by amending Private Water Supplies (Wales) Regulations 2010 (option 2) is the preferred option due to a range of factors. Infraction could occur from non-compliance, which would impose significant costs in terms of fines to the member state. These costs would be avoided through transposing the Directive. However, there would be costs incurred by Welsh businesses for risk assessments, monitoring, sampling and analysis of their private water supplies. There would be further costs associated with setting up additional laboratories that are capable of radon testing. There may also be further costs to businesses of remedial works to premises in the event of harmful levels being detected, although the likelihood of detecting harmful levels of radon appears to be low. Costs of guidance to businesses would also be incurred by the Drinking Water Inspectorate.

Although the risk of harmful levels of radon in premises in Wales is low, there is potential public health benefits associated with option 2. Cancer is a primary hazard relating to the consumption of radon. Therefore option 2 is the preferred option as it would deliver public health benefits, whilst incurring lower costs relative to the ‘do nothing’ option.

Competition Assessment

Businesses that rely on private water supplies from underground sources may be put at a competitive disadvantage. However, given that there would likely be a small number of businesses affected, any distortionary impact on their market conditions would be minimal. Furthermore, as the affected businesses are expected to be located in rural areas, they are more likely to service the local community and not be subject to competitive forces that are more characteristic of urban areas with a higher number of competing firms.