



SCOTTISH EXECUTIVE

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Dear Colleague

The Private Water Supplies (Scotland) Regulations 2006 – Information Letter 4/2006

Regulation 24 – Monitoring for radioactivity in private water supplies in Scotland

1. Purpose

The purpose of this letter is to inform local authorities of Scottish Minister's determinations regarding the need to monitor for total indicative dose and tritium under the requirements of Regulation 24 of The Private Water Supplies (Scotland) Regulations 2006.

2. Background

(i) Regulation 24 of The Private Water Supplies (Scotland) Regulations 2006 provides that the requirements of Part C of Schedule 1 to 'COUNCIL DIRECTIVE 98/83/EC on the quality of water intended for human consumption', for monitoring of drinking water supplies for tritium and for 'total indicative dose', can be set aside by authority of the Scottish Ministers where certain conditions apply. For tritium monitoring, the relevant condition is that the Scottish Ministers are satisfied that the specific activity arising from the tritium content is well below 100 Bq/litre. Regarding monitoring for 'total indicative dose', the relevant condition is that the Scottish Ministers are satisfied that the dose of radioactivity to any consumer due to radioactive substances in the water, with the exception of tritium, potassium 40, radon and radon decay products will be well below 0.1 milli Sieverts (mSv) per annum.

(ii) The relevant United Kingdom authorities carry out a programme of regular monitoring of food and drinking water in the general diet and in sources of public drinking water across the United Kingdom, as required under the provisions of Article 35 of the Euratom Treaty. The results are reported in the annual report on 'Radioactivity in the Food and the Environment, (RIFE) which is published jointly by the Environment Agency, Environment and Heritage Service (NI) the Food Standards Agency and SEPA. . The 10th report in the series, RIFE-10, for the calendar year 2004,



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was published in October 2005. The reports are available on-line at <http://www.sepa.org.uk/publications/rife/index.htm>

(iii) In Scotland, discharges of radioactivity are regulated by SEPA under the terms of authorisations issued under the provisions of the Radioactive Substances Act 1993. In setting appropriate authorised discharge limits, SEPA ensures that operators take the best practicable means to reduce the radioactivity in any such discharges. That should ensure that discharges of radioactivity to the environment are kept to a minimum. This is confirmed by the RIFE report. In addition to surface waters, air and rainwater is also included within the programme for Article 35 Euratom monitoring. The authorities that publish RIFE conclude that concentrations of radioactivity in air and rainwater are very low, such that they do not merit the need for radiological assessment.

(iii) The results from the RIFE monitoring programme are representative of the main drinking water sources in Scotland and are representative of natural waters before treatment and supply to the public water system. The results are given in Table 9.13 of RIFE-10. Those show that most tritium levels were at or around the limit of detection, which is about 1% of the EU parametric value for tritium of 100 Bq/litre. Levels of tritium in surface waters near Chapelcross have been at times higher than the limit of detection, although still well below the parametric value. That site is now in the process of decommissioning and tritium levels in the local environment will continue to be monitored to ensure that they decline as expected.

(iv) Some private water supplies are taken from underground sources but, since it has been shown above that surface waters and precipitation do not contain levels of tritium that give cause for concern, then neither can underground sources of water generally.

(v) It is the case that elevated levels of tritium have been found in leachate from some landfill sites but it is inconceivable that tip leachate could be used directly for drinking water purposes. Tritium in leachate is assumed to have arisen from the disposal to landfill of gaseous tritium luminising devices, contained in self-illuminating exit signs, for example. It is likely that any such tritium will be rapidly diluted with distance from its point of arising and so levels in below-surface water will be very much less than those found in leachate itself.

(vi) Private water supplies within 250 metres of landfill sites are automatically categorised as being “at risk”. It is considered prudent then to recommend that any such private supply identified as being in that category is monitored for tritium if it is considered necessary for it to be monitored for other pollutants.

(vii) Regarding the need to monitor for ‘total indicative dose’, this should only be required when appropriate screening values for the concentration of gross alpha or gross beta activity are exceeded. The screening values defined by the World Health Organization (WHO) are respectively 0.5 Bq/litre for total alpha drinking water and 1.0 Bq/litre for total beta drinking water. All values in RIFE for total alpha radiation were less than the limit of detection, which was generally about 2% of the screening value. For total beta, the values were all less than 11% of the WHO screening value. These results suggest that monitoring for ‘total indicative dose’ in these waters is not required.

(viii) For the reasons outlined at (iv) above for tritium, it is considered that there will be no transfer of total alpha- and total beta-radioactivity, from above ground sources to below-surface waters, which is significant with respect to the EU parameter of total indicative dose.

(ix) It is of course the case that there are potential sources of transfer of such radioactivity in below ground waters from natural processes. There are parts of Scotland, such as Deeside and Helmsdale,



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which are classified as being at risk with respect to radon in housing. That radon is formed, by natural processes, from uranium in the underlying rock. That uranium, and its daughter products, could be present in water passing through, or in contact with, that rock. There is no evidence, however, that groundwater in Scotland would exceed values that give cause for concern with respect to total indicative dose.

(x) FSA published in 2004 a report on the "Analysis of the natural radioactivity content of bottled waters": <http://www.food.gov.uk/science/surveillance/fsis2004branch/fsis6704>


Many of the samples included in the analysis were sourced from Scotland. The highest value for total alpha recorded in Scotland came from Deeside and was 0.13 Bq/litre, which is about a quarter of the WHO screening value for drinking water. The same sample contained 0.25 Bq/litre of total beta, again a quarter of the WHO screening value for drinking water. Those highest values do not give cause for concern with respect to total indicative dose.

(xi) Current evidence points firmly to the conclusion that there is no need to require local authorities to monitor drinking water supplies in Scotland for total indicative dose. However, it is considered prudent to carry out a limited programme of sampling and analysis of under-ground private drinking supplies in radon-affected areas to further strengthen the information base on which this recommendation can be made. The Scottish Executive has therefore initiated a limited programme of sampling and analyses of these waters. It is further proposed that monitoring of these same waters will be included in future sampling undertaken for RIFE.

3. Recommendation

For the purposes of Regulation 24 of the Private Water Supplies (Scotland) Regulations 2006 the Scottish Ministers have determined that no local authority in Scotland shall be required to monitor for total indicative dose or for tritium under the requirements of these Regulations.

Yours sincerely


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