



STATUTORY INSTRUMENTS.

S.I. No. 160 of 2016



EUROPEAN UNION (RADIOACTIVE SUBSTANCES IN DRINKING
WATER) REGULATIONS 2016

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S.I. No. 160 of 2016

EUROPEAN UNION (RADIOACTIVE SUBSTANCES IN DRINKING WATER) REGULATIONS 2016

WHEREAS, I, ALAN KELLY, Minister for the Environment, Community and Local Government, having regard to Section 3(3) of the European Communities Act 1972 (as inserted by Section 2 of the European Communities Act 2007) (hereinafter referred to as the Act of 1972), consider it necessary for the purpose of giving effect to Council Directive 98/83/EC of 3 November 1998¹ and Directive 2013/51/Euratom of the European Parliament and of the Council of 22 October 2013² to make provision for offences under the following Regulations to be prosecuted on indictment:

AND WHEREAS, I consider that it is necessary, having further regard to Section 3(3) of the Act of 1972, and for the purpose of ensuring that penalties in respect of an offence prosecuted in that manner under the following Regulations are effective, proportionate and have a deterrent effect, having regard to the acts or omissions of which the offence consists, to make such provision in the following Regulations:

NOW THEREFORE, I, ALAN KELLY, Minister for the Environment, Community and Local Government, in exercise of the powers conferred on me by Section 3 of the European Communities Act 1972 (No. 27 of 1972) as amended by the European Communities Act 2007 (No. 18 of 2007) and for the purpose of giving effect to Council Directive 98/83/EC of 3 November 1998¹, and Directive 2013/51/Euratom of the European Parliament and of the Council of 22 October, 2013², hereby make the following Regulations:

Citation.

1. These Regulations may be cited as the European Union (Radioactive Substances in Drinking Water) Regulations 2016.

Interpretation.

2. (1) In these Regulations, except where the context otherwise requires—

“the Agency” means the Environmental Protection Agency;

“authorised person” means a person appointed in writing by Irish Water or a local authority or the Agency to be an authorised person for the purposes of these Regulations;

“the Directive” means Council Directive 2013/51/Euratom of 22 October 2013 which lays down requirements for the protection of the health of the general

¹O.J. No. L330/32, 5.12.1998

²O.J. No. L 296/12 7.11.2013

Notice of the making of this Statutory Instrument was published in “Iris Oifigiúil” of 15th April, 2016.

public with regard to radioactive substances in water intended for human consumption;

“exempted supply” means a supply of water which—

- (a) (i) constitutes an individual supply of less than 10 cubic metres a day on average or serves fewer than 50 persons, and
- (ii) is not supplied as part of a commercial or public activity, or
- (b) is used exclusively for purposes in respect of which the relevant supervisory authority is satisfied that the quality of the water has no influence, either directly or indirectly, on the health of the general public concerned;

“indicative dose” or “ID” means the committed effective dose for one year of ingestion resulting from all the radionuclides whose presence has been detected in a supply of water intended for human consumption, of natural and artificial origin, but excluding tritium, potassium-40, radon and short-lived radon decay products;

“local authority” means—

- (a) a city council,
- (b) a county council, or
- (c) a city and county council;

“Minister” means the Minister for the Environment, Community and Local Government;

“monitoring” includes auditing, inspection, measurement, sampling or analysis, whether periodic or continuous;

“parametric value” means the value of radioactive substances in water intended for human consumption above which it must be assessed whether the presence of such substances poses a risk to human health requiring action to improve the quality of water to a level which complies with the requirements for the protection of human health from a radiation protection point of view;

“premises” includes any building, structure or land (whether or not there are structures on the land), and any plant or related accessories on or under such land, or any hereditament of tenure, together with any outbuildings and curtilage;

“public water supply” means a water supply which is in the charge or ownership of Irish Water or any person acting jointly with it or on its behalf under a service level agreement or contract;

“radioactive substance” means any substance that contains one or more radio-nuclides the activity or concentration of which cannot be disregarded as far as radiation protection is concerned;

“supervisory authority” means—

- (a) in the case of water intended for human consumption supplied by Irish Water or any person acting jointly with it or on its behalf, the Agency;
- (b) in the case of water intended for human consumption supplied by any other person, the local authority in whose functional area the water is supplied, or the local authority otherwise designated under Regulation 5(3);

“water intended for human consumption” means—

- (a) all water, either in its original state or after treatment, intended for drinking, cooking, food preparation or other domestic purposes, regardless of its origin and whether it is supplied from a distribution network, a tanker, or similar means;
- (b) all water used in any food production undertaking for the manufacture, processing, preservation or marketing of products or substances intended for human consumption unless the supervisory authority is satisfied that the quality of the water cannot affect the wholesomeness of the foodstuff in its finished form,

other than—

- (i) natural mineral waters, recognised as such by the responsible authority as defined in the European Communities (Natural Mineral Waters, Spring Waters and Other Waters in Bottles or Containers) Regulations 2007 (S.I. No. 225 of 2007),
- (ii) water supplied in bottles or containers,
- (iii) waters which are medicinal products within the meaning of Council Directive 2001/83/EC of 6 November 2001³, or
- (iv) an exempted supply;

“water supplier” means any person supplying water intended for human consumption.

(2) In these Regulations—

- (a) a reference to a Regulation or the Schedule which is not otherwise identified is a reference to a Regulation or the Schedule of these Regulations,

³O.J. No. L311/67, 28.11.2001

- (b) a reference to a paragraph, subparagraph or clause which is not otherwise identified is a reference to a paragraph, subparagraph or clause of the Regulation in which the reference occurs, and
- (c) a reference to a Schedule or part of it includes, where the context permits, any accompanying notes.

Obligations of suppliers.

3. A water supplier shall ensure that water intended for human consumption shall be monitored to assess compliance with the parametric values laid down in Part 1 of the Schedule to these Regulations. In the event of non-compliance with the specified parametric values—

- (a) it shall be assessed whether the non-compliance poses a risk to human health which requires action, and
- (b) where necessary remedial action shall be taken by a water supplier, to improve the quality of water to a level which complies with requirements for the protection of human health from a radiation protection point of view.

Point of compliance.

4. (1) The point of compliance shall be in the case of—

- (a) water supplied from a distribution network or a private source, at the point within a premises at which it emerges from the tap or taps that are normally used for the provision of water for human consumption;
- (b) water supplied by tanker or similar means, at the point at which it emerges from the tanker;
- (c) water used in a food-production undertaking, at the point where the water is used in the undertaking.

(2) The definition of points of compliance in paragraph (1) is without prejudice to the choice of sampling point, which may be any point within the supply zone or at the treatment works provided there is no adverse change in the concentration value between the sampling point and the point of compliance.

Monitoring and Assessment.

- 5. (1) (a) Irish Water shall be responsible for monitoring public water supplies for radioactive substances in accordance with the monitoring principles and frequencies set out in Part 2 of the Schedule, in order to check whether the values of radioactive substances comply with the parametric values specified in Part 1 of the Schedule.
- (b) Irish Water shall be responsible for ensuring that public water supplies are monitored for the indicative dose, and analytical performance characteristics shall be in accordance with the requirements set out in Part 2 of the Schedule.

- (c) The Agency shall verify compliance of water intended for human consumption supplied by Irish Water, or any person acting jointly with it or on its behalf, with the parametric values specified in Part 1 of the Schedule in accordance with Part 2 and Part 3 of the Schedule.

(2) Subject to paragraph (3), each local authority shall monitor compliance of water intended for human consumption supplied in its functional area by any supplier other than Irish Water, with the parametric values specified in Part 1 of the Schedule in accordance with Part 2 and Part 3 of the Schedule.

(3) Where a water supply referred to in paragraph (2) is provided within the functional area of two or more local authorities then the following applies;

- (a) subject to subparagraph (b), those local authorities may decide that one of them shall perform the functions required under that paragraph in respect of that water supply;

- (b) the Minister may direct those local authorities to nominate a single local authority from among themselves to perform those functions, and where the authorities fail to comply with such a direction the Minister may direct that a specified local authority shall perform them;

- (c) the authority nominated under subparagraph (a), or specified under subparagraph (b) shall have such functions in regard to such supply as if it was provided solely in its functional area in the first instance;

(4) (a) For the purpose of establishing compliance with the parametric values specified in Part 1 of the Schedule and in view of fulfilling their respective obligations under paragraphs (1) and (2), each local authority and the Agency shall take all measures necessary to ensure that monitoring and assessment of water supplies for which it has supervisory responsibility, is carried out in accordance with any guidelines issued by the Agency under paragraph (5).

- (b) Each supervisory authority shall be responsible for the enforcement of compliance with these Regulations by the water suppliers for whom it has supervisory responsibility under these Regulations.

(5) The Agency may issue guidelines on the manner, frequency and method by which parameters in Part 1 of the Schedule shall be monitored and on the procedures to be adopted for assessing whether water for human consumption poses a risk to human health from a radiation point of view.

(6) The Agency shall supervise the performance by Irish Water and each local authority of their monitoring and assessment functions under these Regulations, and may issue such direction to Irish Water or a local authority as it considers necessary to ensure that Irish Water or the local authority are complying with their obligations under these Regulations.

(7) Irish Water or a local authority shall comply with a direction from the Agency under paragraph (6).

(8) Irish Water or a local authority commits an offence if they fail to comply with a direction from the Agency under these Regulations.

(9) Regulation 18 of the European Union (Drinking Water) Regulations 2014 (S.I. No. 122 of 2014) shall apply to these regulations with any necessary modifications.

Protection of human health.

6. (1) Where Irish Water or a local authority, in consultation with the Health Service Executive, considers that a supply of water intended for human consumption constitutes a potential danger to human health from a radiation protection point of view, Irish Water or the authority shall, subject to agreement with the Health Service Executive, ensure that—

(a) consumers are informed promptly thereof and given the necessary advice, and

(b) in the case of a public water supply, the Agency is informed promptly.

(2) For the purposes of paragraph (1), and subject to agreement with the Health Service Executive, where a supervisory authority is of the opinion that non-compliance with a water quality standard or other parametric value specified in Part 1 of the Schedule, in water intended for human consumption, constitutes, or may constitute, a risk to human health from a radiation protection point of view, the supervisory authority shall issue such direction to the relevant water supplier as it considers necessary to ensure that appropriate measures are taken for the purposes of preventing, limiting, eliminating or abating such risk, and the water supplier shall comply with such a direction.

(3) For the purposes of paragraph (2), a supervisory authority shall decide what action should be taken under this Regulation having due regard to the risks to human health that would be caused by an interruption of the supply or a restriction in the use of water intended for human consumption.

(4) The Agency may issue guidelines to assist Irish Water or a local authority to fulfil their obligations under this Regulation.

(5) A water supplier commits an offence if it fails to comply with a direction from a supervisory authority under this Regulation.

(6) Irish Water commits an offence if it fails to inform the Agency in accordance with paragraph (1)(b).

Remedial action.

7. (1) (a) Irish Water shall ensure that any failure to meet the parametric values specified in Part 1 of the Schedule in its water supply is immediately assessed to determine whether non-compliance poses a risk to human health which requires action.

- (b) Each relevant local authority shall ensure that any failure to meet the parametric values specified in Part 1 of the Schedule in a water supply for which it is a supervisory authority, is immediately assessed to determine whether non-compliance poses a risk to human health which requires action.

(2) For the purposes of paragraph (1), where a water supplier discovers a failure to meet the values specified in Part 1 of the Schedule in its water supply, that person shall notify the relevant supervisory authority for that supply in accordance with such guidelines as the Agency may issue for that purpose.

(3) A water supplier commits an offence if that person fails to notify the relevant supervisory authority in accordance with paragraph (2).

(4) Subject to paragraph (5), where it is found, as a result of monitoring carried out for the purposes of these Regulations, that the quality of water intended for human consumption does not meet the parametric values specified in Part 1 of the Schedule and poses a risk to human health from a radiation protection point of view, the supervisory authority shall ensure that the necessary remedial action is taken by the water supplier in order to comply with requirements for the protection of human health from a radiation protection point of view.

(5) The Agency may issue guidelines in relation to the nature and timing of remedial, enforcement or other relevant action under this Regulation and Irish Water and local authorities shall take such guidelines fully into account when fulfilling their obligations under paragraph (4).

(6) Where remedial action is taken in relation to a water supply, the water supplier shall ensure that consumers are informed of such action.

(7) For the purposes of paragraph (1), each water supplier shall maintain a record of any incidence of failure to meet the parametric values specified in Part 1 of the Schedule, and such record shall include details of—

- (a) the date of the incident,
- (b) the extent and duration of the failure,
- (c) the cause of the failure, and
- (d) details of any complaint received arising from such failure.

(8) A water supplier commits an offence if that person fails to—

- (a) comply with a direction under paragraph (4) and
- (b) inform consumers in accordance with paragraph (6).

Intervention by supervisory authority.

8. (1) Having exercised such of its powers under these Regulations as it considers appropriate, and having considered any information furnished to it or otherwise coming into its possession in consequence of that exercise, each supervisory authority shall, with a view to achieving satisfactory compliance of water supplied for human consumption from a radiation protection point of view with the requirements of these Regulations do all or any of the following:

- (a) issue such direction to a water supplier, as it considers necessary;
- (b) provide, on such terms and conditions as may be agreed, such assistance or support as the supervisory authority considers, in consultation with the water supplier, would be helpful.

(2) Where a water supplier fails to comply with a direction issued under paragraph (1), the supervisory authority may carry out, cause to be carried out, or arrange for, such action as it considers necessary to ensure compliance with that direction, and the costs of such action may be recovered by the authority from the water supplier concerned as a simple contract debt in any court of competent jurisdiction.

Information in case of exempted supplies.

9. (1) Each relevant local authority shall take measures, in accordance with guidelines issued by the Agency, to notify the population served by an exempted supply of—

- (a) the fact that these Regulations do not apply to such supply, and
- (b) action that can be taken to protect human health from a radiation protection point of view of water intended for human consumption, and

(2) Where it is apparent to a local authority that a potential danger to human health arises from the quality of an exempted supply from a radiation protection point of view, it shall, in accordance with guidelines issued by the Agency, ensure that the consumers of that supply are given appropriate advice promptly.

(3) The Agency may issue guidelines for the purposes of paragraphs (1) or (2), which shall be binding.

(4) A local authority commits an offence if it fails to comply with paragraphs (1) or (2).

Directions.

10. (1) A supervisory authority may give such directions as it considers appropriate for the purposes of its functions under these Regulations.

(2) A person commits an offence if that person fails to comply with a direction under paragraph (1).

Injunctive relief.

11. (1) Where, on application by a supervisory authority to the High Court, the Court is satisfied that a person has failed to comply with a direction or a requirement of, or under, these Regulations, the Court may by order—

- (a) direct the person to comply with the direction or requirement, and
- (b) make such other provision, including provision in relation to the payment of costs, as the Court considers appropriate.

(2) An application for an order under this Regulation shall be by motion, and the High Court, when considering the matter, may make such interim or interlocutory order as it considers appropriate.

(3) An application for an order under this Regulation may be made whether or not there has been a prosecution for an offence under these Regulations in relation to the activity concerned, and shall not prejudice the initiation of a prosecution for an offence under these Regulations in relation to the activity concerned.

Powers of authorised persons.

12. (1) An authorised person may at all reasonable times, or at any time if that person has reasonable grounds for believing that there is or may be a risk to human health or life from radiation protection point of view, enter any premises for the purposes of these Regulations, and bring on to those premises such other persons or equipment, and carry out such work as that authorised person may consider necessary.

(2) When exercising the powers conferred under these Regulations, an authorised person shall, if so required, provide evidence of the authorised person's authority.

(3) A person commits an offence if he or she—

- (a) refuses to allow an authorised person on to a premises, or to allow an authorised person to bring any other person or equipment with him or her on to a premises or carry out any work in the exercise of the authorised person's powers under these Regulations,
- (b) obstructs or impedes an authorised person in the exercise of the authorised person's powers,
- (c) gives to an authorised person information which, to the knowledge of the person giving it, is false or misleading in a material respect, or
- (d) fails or refuses to comply with a direction or requirement of an authorised person.

Charges by supervisory authorities.

13. (1) A supervisory authority may charge for monitoring the quality of water supplies intended for human consumption from a radiation protection point of view.

(2) A charge made by a supervisory authority by virtue of paragraph (1) shall be of such amount as the authority considers appropriate, but shall not exceed the cost of such monitoring.

(3) A supervisory authority may recover the amount of any charge made by it under paragraph (1) as a simple contract debt in any court of competent jurisdiction.

Offences by bodies corporate.

14. (1) Where an offence under these Regulations has been committed by a body corporate and is proved to have been committed with the consent or connivance of or to be attributable to any neglect on the part of a person being a director, manager, secretary or other similar officer of the body corporate, or of a person who was purporting to act in any such capacity, that person as well as the body corporate is guilty of an offence and is liable to be proceeded against and punished as if that person was guilty of the first-mentioned offence.

(2) Where the affairs of a body corporate are managed by its members, paragraph (1) shall apply in relation to the acts and defaults of a member in connection with that member's functions of management as if that member was a director of the body corporate.

Prosecutions and penalties.

15. (1) A prosecution for an offence under these Regulations may be taken by the Agency, Irish Water or relevant local authority, as appropriate.

(2) A person guilty of an offence under Regulation 5(8), 6(5), 6(6), 7(3), 7(8), 9(4), 10(2) or 12(3) is liable—

(a) on summary conviction, to a Class A fine or imprisonment for a term not exceeding 3 months, or both, or

(b) on conviction on indictment, to a fine not exceeding €500,000, or imprisonment for a term not exceeding 3 years, or both.

SCHEDULE

*Part 1***PARAMETRIC VALUES**

Parameter	Parametric value	Unit	Notes
Radon	500	Bq/l	(Note 1)
Tritium	100	Bq/l	(Note 2)
ID	0.10	mSv	

Note 1: Remedial action is deemed to be justified on radiological protection grounds, without further consideration, where radon concentrations exceed 1000 Bq/l.

Note 2: Elevated levels of tritium may indicate the presence of other artificial radionuclides. If the tritium concentration exceeds its parametric value, an analysis of the presence of other artificial radionuclides shall be required.

*Part 2***MONITORING OF RADIOACTIVE SUBSTANCES****1. General principles and monitoring frequencies**

All parameters for which parametric values set out in Part 1 shall be subject to monitoring. However, no monitoring of a specific parameter shall be required where it can be established, that the parameter is not likely to be present in a given supply of water intended for human consumption in concentrations which could exceed the corresponding parametric value.

In case of naturally occurring radionuclides, where previous results have shown that the concentration of radionuclides is stable, the frequency, in derogation from the minimum sampling requirements set out in table A, is to be decided by the Agency, taking into consideration the risk to human health. Monitoring of water intended for human consumption is not required for radon or tritium or to establish the ID where the Agency is satisfied on the basis of representative surveys, monitoring data or other reliable information that, for a period of 6 years, the levels of radon, tritium or of the calculated ID will remain below the respective parametric values listed in Part 1. In that case, it shall communicate the grounds for its decision to the Commission and provide the Commission with the necessary documentation supporting that decision, including the findings of any surveys, monitoring or investigations carried out. In this context, the provisions with regard to the minimum sampling and analysis requirements set out in table A do not apply.

2. Radon

Irish Water and, where relevant, local authorities shall ensure that representative surveys are undertaken to determine the scale and nature of likely exposures to radon in water intended for human consumption originating from different types of ground water sources and wells in different geological areas. The surveys shall be designed in such a way that underlying parameters, and especially the geology and hydrology of the area, radioactivity of rock or soil, and well type, can be identified and used to direct further action to areas of likely high exposure. Monitoring of radon concentrations shall be undertaken where there is reason to believe, on the basis of the results of the representative surveys or other reliable information, that the parametric value laid down pursuant to Part 1 of the Schedule might be exceeded.

3. Tritium

Irish Water and, where relevant, local authorities shall ensure that monitoring of tritium in water intended for human consumption is carried out where an anthropogenic source of tritium or other artificial radionuclides is present within the catchment area and it cannot be shown on the basis of other surveillance programmes or investigations that the level of tritium is below the parametric value listed in Part I of the Schedule. Where monitoring for tritium is required, it shall be carried out at the frequencies indicated in table A. If the concentration of tritium exceeds its parametric value, an investigation of the presence of other artificial radionuclides shall be required.

4. Indicative dose

Monitoring of water intended for human consumption for the ID shall be carried out where a source of artificial or elevated natural radioactivity is present and it cannot be shown on the basis of other representative monitoring programmes or other investigations that the level of ID is below the parametric value listed in Part I. Where monitoring for artificial radionuclide levels is required, it shall be carried out at the frequency indicated in table A. Where monitoring for natural radionuclide levels is required, the Agency shall determine the frequency of the monitoring of either gross alpha activity, gross beta activity or individual natural radionuclides depending on the screening strategy adopted by it (according to Part 3 of the Schedule). The monitoring frequency may vary from a single check measurement to the frequencies indicated in the table appearing in table A. Where only a single check for natural radioactivity is required, a recheck shall be required at least where any change occurs in relation to the supply likely to influence the concentrations of radionuclides in water intended for human consumption.

5. Water treatment

Where treatment to reduce the level of radionuclides in water intended for human consumption has been taken, monitoring shall be carried out at the frequencies indicated in table A to ensure the continued efficacy of that treatment.

6. Minimum sampling and analysis frequencies

The minimum sampling and analysis frequency for the monitoring of water intended for human consumption supplied from a distribution network or from a tanker or used in a food production undertaking shall be as set out in the following table:

Table A

Minimum sampling and analysis frequencies for monitoring of water intended for human consumption supplied from a distribution network or from a tanker or used in a food production undertaking

Volume of water distributed or produced each day within a supply zone (Notes 1 and 2) m ³	Number of samples per year (Notes 3 and 4)
volume ≤ 100	(Note 5)
100 < volume ≤ 1000	1
1000 < volume ≤ 10000	1 + 1 for each 3300 m ³ /d and part thereof of the total volume
10000 < volume ≤ 100000	3 + 1 for each 10000 m ³ /d and part thereof of the total volume
volume > 100000	10 + 1 for each 25000 m ³ /d and part thereof of the total volume

Note 1: A supply zone is a geographically defined area within which water intended for human consumption comes from one or more sources and within which water quality may be considered as being approximately uniform.

Note 2: The volumes are calculated as averages taken over a calendar year. The number of inhabitants in a supply zone may be used instead of the volume of water to determine the minimum frequency, assuming a water consumption of 200l/day/capita.

Note 3: As far as possible, the number of samples should be distributed equally in time and location.

Note 4: In the event of intermittent short-term supply the monitoring frequency of water distributed by tankers is to be decided by the water supplier concerned.

Note 5: The frequency is to be decided by the supervisory authority, subject to any relevant guidance issued by the Agency.

7. Averaging

Where a parametric value is exceeded in a particular sample, the supervisory authority, subject to any relevant guidance issued by the Agency shall define

the extent of resampling necessary to ensure that the measured values are representative of an average activity concentration for a full year.

Part 3

MONITORING FOR INDICATIVE DOSE AND ANALYTICAL PERFORMANCE CHARACTERISTICS

1. Monitoring for compliance with the ID

Various reliable screening strategies may be used to indicate the presence of radioactivity in water intended for human consumption. These strategies may include screening for certain radionuclides, or screening for an individual radionuclide, or gross alpha activity or gross beta activity screening.

(a) Screening for certain radionuclides, or screening for an individual radionuclide

If one of the activity concentrations exceeds 20% of the corresponding derived value or the tritium concentration exceeds its parametric value listed in Part I, an analysis of additional radionuclides shall be required. The radionuclides to be measured shall be defined by the Agency taking into account all relevant information about likely sources of radioactivity.

(b) Screening strategies for gross alpha activity and gross beta activity

Screening strategies may be used for gross alpha activity and gross beta activity¹ to monitor for the parametric indicator value for ID.

For this purpose gross alpha activity or gross beta activity screening levels shall be set. The recommended screening level for gross alpha activity is 0.1 Bq/l. The recommended screening level for gross beta activity is 1.0 Bq/l.

If the gross alpha activity and gross beta activity are less than 0.1 Bq/l and 1.0 Bq/l respectively, it is assumed that the ID is less than the parametric value of 0.1 mSv and radiological investigation is not needed unless it is known from other sources of information that specific radionuclides are present in the water that are liable to cause an ID in excess of 0.1 mSv.

If the gross alpha activity exceeds 0.1 Bq/l or the gross beta activity exceeds 1.0 Bq/l, analysis for specific radionuclides shall be required.

Alternative screening levels may be set for gross alpha activity and gross beta activity where they can demonstrate that the alternative levels are in compliance with an ID of 0.1 mSv.

The radionuclides to be measured shall be defined by the Agency taking into account all relevant information about likely sources of radioactivity. Since elevated levels of tritium may indicate the presence of other artificial radionuclides,

¹Where appropriate, gross beta activity may be replaced by residual beta activity after subtraction of the K-40 activity concentration.

tritium, gross alpha activity and gross beta activity should be measured in the same sample.

2. Calculation of the ID

The ID shall be calculated from the measured radionuclide concentrations and the dose coefficients laid down in Annex III, Table A of Directive 96/29/Euratom or more recent information recognised by the Agency, on the basis of the annual intake of water (730 l for adults). Where the following formula is satisfied, it may be assumed that the ID is less than the parametric value of 0.1 mSv and no further investigation shall be required:

$$\sum_{i=1}^n \frac{C_i(obs)}{C_i(der)} \leq 1$$

where

$C_i(obs)$ = observed concentration of radionuclide i

$C_i(der)$ = derived concentration of radionuclide i

n = number of radionuclides detected.

Derived concentrations for radioactivity in water intended for human consumption¹

Origin	Nuclide	Derived concentration
Natural	U-238 ²	3,0 Bq/l
	U-234 ²	2,8 Bq/l
	Ra-226	0,5 Bq/l
	Ra-228	0,2 Bq/l
	Pb-210	0,2 Bq/l
	Po-210	0,1 Bq/l
Artificial	C-14	240 Bq/l
	Sr-90	4,9 Bq/l
	Pu-239/Pu-240	0,6 Bq/l
	Am-241	0,7 Bq/l
	Co-60	40 Bq/l

¹This table includes values for the most common natural and artificial radionuclides; these are precise values, calculated for a dose of 0.1 mSv, an annual intake of 730 litre and using the dose coefficients laid down in Annex III, Table A of Directive 96/29/Euratom; derived concentrations for other radionuclides can be calculated on the same basis, and values can be updated on the basis of more recent information recognised by the competent authorities in the Member State.

²This table allows only for the radiological properties of uranium, not for its chemical toxicity.

Origin	Nuclide	Derived concentration
	Cs-134	7,2 Bq/l
	Cs-137	11 Bq/l
	I-131	6,2 Bq/l

3. Performance characteristics and methods of analysis

For the following parameters and radionuclides, the method of analysis used must, as a minimum, be capable of measuring activity concentrations with a limit of detection specified below:

Parameters and radionuclides	Limit of detection (Notes 1, 2)	Notes
Tritium	10 Bq/l	Note 3
Radon	10 Bq/l	Note 3
gross alpha activity gross beta activity	0,04Bq/l 0,4 Bq/l	Note 4 Note 4
U-238	0,02 Bq/l	
U-234	0,02 Bq/l	
Ra-226	0,04 Bq/l	
Ra-228	0,02 Bq/l	Note 5
Pb-210	0,02 Bq/l	
Po-210	0,01 Bq/l	
C-14	20 Bq/l	
Sr-90	0,4 Bq/l	
Pu-239/Pu-240	0,04 Bq/l	
Am-241	0,06 Bq/l	
Co-60	0,5 Bq/l	
Cs-134	0,5 Bq/l	
Cs-137	0,5 Bq/l	
I-131	0,5 Bq/l	

Note 1: The limit of detection shall be calculated according to the ISO standard 11929 or equivalent: Determination of the characteristic limits (decision threshold, detection limit and limits of the confidence interval) for measurements of ionising radiation — Fundamentals and application, with probabilities of errors of 1st and 2nd kind of 0,05 each.

Note 2: Measurement uncertainties shall be calculated and reported as complete standard uncertainties, or as expanded standard uncertainties with an expansion factor of 1,96, according to the ISO Guide for the Expression of Uncertainty in Measurement.

Note 3: The limit of detection for tritium and for radon is 10% of its parametric value of 100 Bq/l.

Note 4: The limit of detection for gross alpha activity and gross beta activities are 40% of the screening values of 0,1 and 1,0 Bq/l respectively.

Note 5: This limit of detection applies only to initial screening for ID for a new water source; if initial checking indicates that it is not plausible that

Ra-228 exceeds 20% of the derived concentration, the limit of detection may be increased to 0,08 Bq/l for routine Ra-228 nuclide specific measurements, until a subsequent re-check is required.



GIVEN under my Official Seal,
1 April 2016.

ALAN KELLY,
Minister for the Environment, Community and Local
Government.

EXPLANATORY NOTE

(This note is not part of the Instrument and does not purport to be a legal interpretation).

The purpose for which these Regulations are made is to lay down requirements for the protection of health of the general public with regard to radioactive substances in drinking water. They include requirements regarding monitoring for radioactive substances in drinking water and address the provision of information to the public.

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