

2015 No. 363

WATER AND SEWERAGE

**The Water Supply (Water Quality) (Amendment) Regulations
(Northern Ireland) 2015**

Made - - - - - *29th October 2015*

Coming into operation - - - - - *28th November 2015*

The Department for Regional Development is designated **(a)** for the purposes of section 2(2) of the European Communities Act 1972 **(b)**, in relation to the environment.

The Department for Regional Development makes these Regulations under Articles 107(1) and (3), 109, and 300(2) of the Water and Sewerage Services (Northern Ireland) Order 2006 **(c)** and section 2(2) of the European Communities Act 1972 **(d)**.

Citation, commencement and interpretation

1.—(1) These Regulations may be cited as the Water Supply (Water Quality) (Amendment) Regulations (Northern Ireland) 2015 and shall come into operation on 28th November 2015.

(2) In these Regulations, “the principal Regulations” means the Water Supply (Water Quality) Regulations (Northern Ireland) 2007 **(e)**.

(3) In these Regulations “the secondary Regulations” means the Water Supply (Water Fittings) Regulations (Northern Ireland) 2009 **(f)**.

(4) The Interpretation Act (Northern Ireland) 1954 **(g)** shall apply to these regulations as it applies to an Act of the Northern Ireland Assembly.

Amendments to the principal Regulations

2.—(1) The principal Regulations are amended as follows.

(2) In Regulation 2(1), in the appropriate place, insert ““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;”

(3) In Regulation 6(6)— for “(total indicative dose and tritium)” substitute “(indicative dose, radon and tritium)”.

(a) S.I. 2008 No. 301
(b) 1972 c.68
(c) S.I 2006/3336 (N.I.21)
(d) 1972 c.68
(e) S.R. 2007/147 as amended by S.R. 2009/246 and S.R. 2010/128
(f) S.R. 2009 No. 255
(g) 1954 c.33 (N.I.)

(4) After regulation 6(6) insert —

“(6A) — A water undertaker may use a screening strategy for gross alpha and gross beta to monitor for the parametric indicator value for indicative dose. Screening values and the additional radiological investigation required in the event of an exceedance are detailed in Schedule 5.”

(5) In Regulation 6(7)—

- (a) For “If, in relation to any water supply zone, the Department is satisfied that water supplied to that zone for regulation 4(1) purposes—” substitute “If, in relation to any water supply zone the water undertaker can submit evidence based on representative surveys, monitoring data, or other reliable information satisfying the Department that water supplied to that zone for regulation 4(1) purposes—”.
- (b) In sub-paragraph (a) replace ‘calculated total indicative dose’ with “calculated indicative dose”.
- (c) In sub-paragraph (b) after “the specification,” add “; or”
- (d) After sub-paragraph (b) insert “(c) contains levels of radon that are well below the specification,”.
- (e) For “shall notify the water undertaker that the total indicative dose parameter (item 9 in Schedule 2) or as the case may be the tritium parameter (item 11 in that Schedule) need not be monitored” substitute, “shall, by notice in writing, inform the water undertaker that the indicative dose parameter (item 10 in Schedule 2) or as the case may be the radon parameter (item 8 in that Schedule) or the tritium parameter (item 12 in that Schedule), need not be monitored and this decision and supporting evidence shall be communicated to the European Commission”.

(6) After Regulation 6(7) insert—

“(7A) A representative survey must be designed in such a way—

- (a) as to be capable of determining the scale and nature of likely exposures to radon in water intended for human consumption originating from different types of groundwater sources and wells in different geological areas; and
- (b) that underlying parameters, 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.”

(7) In Regulation 6(8)—

- (a) In sub-paragraph (a) replace “total indicative dose” with “indicative dose” in both places.
- (b) After sub-paragraph (b), insert “(c) withdraw a notice under paragraph (7) given in relation to the radon parameter if it believes that water supplied to the zone in question for regulation 4(1) purposes contains levels of radon that are not well below the specification;”

(8) In Regulation 6(9) for “the total indicative dose parameter or, as the case may be, the tritium parameter” substitute “the indicative dose parameter or, as the case may be, the radon parameter or the tritium parameter”.

(9) In Regulation 8(1) for “25” substitute “26”.

(10) In Regulation 9(4)(b) for “25” substitute “26”.

(11) In Regulation 30—

- (a) In paragraph (1), omit the definitions for “the Directive”, “European technical approval” and “harmonised standard”;
- (b) In paragraph (3) – replace the reference to “the Directive,” with reference to “Regulation (EU) No 305/2011 of the European Parliament and of the Council laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC,”;
- (c) In paragraph (3) omit sub-paragraph (a).

- (d) In paragraph (3) sub-paragraph (b) becomes sub-paragraph (a).
- (12) For the table in Schedule 2 of the principal Regulations, substitute the table in Schedule 1.
- (13) For tables 1-3 in Schedule 3 of the principal Regulations, substitute tables 1-3 in Schedule 2.
- (14) After Schedule 4 of the principal Regulations, insert Schedule 5 as set out in Schedule 3.

Amendments to secondary Regulations

3.—(1) In Regulation 1(2) omit the references to “the Directive”, “European technical approval” and “harmonised standard”.

(2) In Regulation 4(2)–

(a) In sub-paragraph (a) for “the Directive;” substitute “Regulation (EU) No. 305/2011 of the European Parliament and of the Council laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC;”;

(b) Omit sub-paragraph (b).

(3) In Regulation 4(6)(a) for “European technical approval” substitute “European Technical Assessment within the meaning of the Regulation mentioned in Regulation 4(2)(a)”.

Sealed with the Official Seal of the Department for Regional Development on 29th October 2015



Linda MacHugh
A senior officer of the
Department for Regional Development

SCHEDULE 1

Regulations 2(12)

“Table in Schedule 2 of the Water Supply (Water Quality) Regulations (Northern Ireland) 2007 (indicator parameters)”

<i>Item</i>	<i>Parameters</i>	<i>Specification concentration or Value (maximum unless otherwise stated) or State</i>	<i>Units of Measurement</i>	<i>Point of Monitoring</i>
1	Ammonium	0.50	mgNH ₄ /l	Consumers' taps
2	Chloride ⁽ⁱ⁾	250	mgCl/l	Supply point ^(*)
3	<i>Clostridium Perfringens</i> (including spores)	0	Number/100ml	Supply point ^(*)
4	Coliform bacteria	0	Number/100ml	Consumers' taps
5	Colony counts	No abnormal change	Number/1ml at 22°C Number/1ml at 37°C	Consumers' taps, service reservoirs and treatment works
6	Conductivity ⁽ⁱ⁾	2500	µS/cm at 20 °C	Supply point ^(*)
7	Hydrogen ion ⁽ⁱ⁾	9.5 6.5 (minimum)	pH value	Consumers' taps
8	Radon (for radioactivity) ^{(ii) (v)}	100	Bq/l	Supply point ^(*)
9	Sulphate ⁽ⁱ⁾	250	mgSO ₄ /l	Supply point ^(*)
10	Indicative dose (for radioactivity) ^{(iii) (v) (vi)}	0.10	mSv	Supply point ^(*)
11	Total organic carbon (TOC)	No abnormal change	mgC/l	Supply point ^(*)
12	Tritium (for radioactivity) ^{(iv) (v)}	100	Bq/l	Supply point ^(*)
13	Turbidity	1	NTU	Treatment works

(*) May be monitored from samples of water leaving treatment works or other supply point, as no significant change during distribution.

(i) The water should not be aggressive.

(ii) Where radon concentrations exceed 1000Bq/l, remedial action shall be carried out on radiological protection grounds without further consideration.

(iii) Excluding tritium, potassium-40, radon, and radon decay products.

(iv) 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 radionuclides shall be required.

(v) Where treatment to reduce the level of radionuclides in water intended for human consumption has been taken, monitoring must be carried out to ensure the continued efficacy of the treatment.

(vi) If the gross alpha activity exceeds 0.1Bq/l or gross beta activity exceeds 1.0Bq/l analysis for specific radionuclides is required.”

SCHEDULE 2

Regulation 2(13)

“Tables 1-3 in Schedule 3 of the Water Supply (Water Quality) Regulations (Northern Ireland) 2007

Table 1:
Parameters and circumstances for check monitoring

<i>Item</i>	<i>Parameter</i>	<i>Circumstances</i>
1	Aluminium	When used as a flocculant or where the water originates from, or is influenced by, surface waters.
2	Ammonium	
3	<i>Clostridium pefringens</i> (including spores)	Where the water originates from, or is influenced by, surface waters.
4	Coliform bacteria	
5	Colony Counts	
6	Colour	
7	Conductivity	
8	<i>Escherichia coli (E.coli)</i>	
9	Hydrogen ion	
10	Indicative Dose	Where treatment to reduce the level of radionuclides in water intended for human consumption has been taken.
11	Iron	When used as a flocculant or where the water originates from, or is influenced by, surface waters.
12	Manganese	Where the water originates from, or is influenced by, surface waters.
13	Nitrate	When chloramination is practised
14	Nitrite	When chloramination is practised
15	Odour	
16	Radon	Where treatment to reduce the level of radionuclides in water intended for human consumption has been taken.
17	Taste	
18	Tritium	Where treatment to reduce the level of radionuclides in water intended for human consumption has been taken.
19	Turbidity	

Note: This table sets out the annual sampling frequencies for all the substances and parameters in column 1. These are determined for each water supply zone according to its estimated population (column 2). The number of samples is either the standard number in column 4 or the reduced number in column 3 (if one is given). Regulation 9 provides for the circumstances in which the reduced number of samples may be taken.

Table 2
Annual Sampling Frequencies: Water Supply Zones

(1) <i>Substances and parameters subject to monitoring</i>	(2) <i>Estimated population of water supply zone</i>	(3) <i>Reduced</i>	(4) <i>Standard</i>
<i>Subject to check monitoring</i>			
<i>E.coli</i> Coliform bacteria	<100 ≥100		4 12 per 5,000 population ⁽ⁱ⁾
Residual disinfectant			
Aluminium	<100	1	2
Ammonium	100-4,999	2	4
<i>Clostridium perfringens</i> (including spores) ^(*)	5,000-9,999	6	12
Colony Counts	10,000-29,999	12	24
Colour	30,000-49,999	18	36
Conductivity ^(*)	50,000-79,999	26	52
Hydrogen ion	80,000-100,000	38	76
Iron			
Manganese			
Nitrate ⁽ⁱⁱ⁾			
Nitrite ⁽ⁱⁱ⁾			
Odour			
Taste			
Turbidity			
<i>Subject to audit monitoring</i>			
Aluminium	<100		1
Antimony	100-4,999		4
Arsenic	5,000-100,000		8
Benzene ^(*)			
Benzo(a)pyrene			
Boron ^(*)			
Bromate ⁽ⁱⁱⁱ⁾			
Cadmium			
Chromium			
<i>Clostridium perfringens</i> (including spores)			
Copper			
Cyanide ^(*)			
1,2, dichloroethane ^(*)			
Enterococci			
Fluoride ^(*)			

<i>(1) Substances and parameters subject to monitoring</i>	<i>(2) Estimated population of water supply zone</i>	<i>(3) Reduced</i>	<i>(4) Standard</i>
Gross Alpha ^{(*) (iv) (v)} Gross Beta ^{(*) (iv) (v)} Iron Lead Manganese Mercury ^(*) Nickel Nitrate ⁽ⁱⁱ⁾ Nitrite ⁽ⁱⁱ⁾ Pesticides and related products ^(*) Polycyclic aromatic hydrocarbons Radon ^(*) Selenium Sodium Trichloroethene/ Tetrachloroethene ^(*) Tetrachloromethane ^(*) Trihalomethanes Chloride ^(*) Sulphate ^(*) Total Organic carbon ^(*) Tritium ^(*)			

(*) Sampling for these parameters may be within water supply zones or at supply points as specified in Table 3, subject to notes (ii) and below (iii) below.

(i) Where the population is not an exact multiple of 5,000, the population figure should be rounded up to the nearest multiple of 5,000.

(ii) Check monitoring in water supply zones is required only where chloramination is practised. In other circumstances audit monitoring is required.

(iii) Audit monitoring in water supply zones is required only where sodium hypochlorite is added after water has left the treatment works. In other circumstances, audit monitoring is required at supply points.

(iv) To monitor for indicative dose (for radioactivity).

(v) In the event that a single sample is taken in a year, a further sample should be taken if there is any change in relation to that supply that could affect the concentration of radionuclides in the water supply.

Note 1: Sampling is at treatment works for the substances and parameters shown in column (1) of Table 3 as items (1) to (6) and at supply points for the other substances and parameters, except nitrite subject to footnotes (ii) and (ii)(a) to the Table below.

Note 2: Table 3 sets out the annual sampling frequencies for all of the substances and parameters in column 2 at treatment works or supply points. The frequencies are determined according to the volume of water supplied at each treatment works or supply point (column 3). The number of samples is either the standard number in column 5 or the reduced number in column 4 (if one is given). Regulation 9 provides for the circumstances in which the reduced number of samples may be taken.

Table 3:

Annual Sampling Frequencies: Treatment Works or Supply Points

(1) Item	(2) Substances and parameters	(3) Volume of water supplied m ³ /d	(4) Reduced	(5) Standard
1	<i>E.coli</i>	<20	-	4
2	Coliform bacteria	20-1,999	12	52
3	Colony counts	2,000-5,999	52	104
4	Nitrite ⁽ⁱⁱ⁾	6,000-11,999	104	208
5	Residual disinfectant	≥ 12,000	104	365
6	Turbidity			
<i>Subject to check monitoring</i>				
7	<i>Clostridium perfringens</i> ⁽ⁱ⁾	<20	-	2
8	Conductivity	20-999	2	4
		1,000-1,999	6	12
		2,000-5,999	12	24
		6,000-9,999	18	36
		10,000-15,999	26	52
		16,000-32,999	52	104
		33,000-49,999	78	156
		50,000-67,999	104	208
		68,000-84,999	130	260
		85,000-101,999	156	312
		102,000-119,999	183	365
		120,000-241,999	365	730
		242,000-484,999	730	1,460
		485,000-728,999	1,095	2,190
8A	Indicative Dose (for radioactivity)	<20		1
8B	Gross alpha ^(iv)	20-999		4
8C	Gross beta ^(iv)	1,000-49,999		8
8D	Radon	50,000-89,999		12
8E	Tritium	90,000-299,999		24
		300,000-649,999		36
		≥ 650,000		48
<i>Subject to audit monitoring</i>				
9	Benzene	<20		1
10	Boron	20-999		4
11	Bromate ⁽ⁱⁱⁱ⁾	1,000-49,999		8
11A	<i>Clostridium perfringens</i>	50,000-89,999		12

	(including spores)		
12	Cyanide	90,000-299,999	24
13	1,2,dichloroethane	300,000-649,999	36
14	Fluoride	≥ 650,000	48
15	Mercury		
16	Nitrite ^(iia)		
17	Pesticides and related products		
18	Trichloroethene/ Tetrachloroethene		
19	Tetrachloromethane		
20	Chloride		
21	Sulphate		
22	Total Organic Carbon		
22a	Radon		
23	Tritium		
24	Indicative Dose (for radioactivity)		
25	Gross alpha ^(iv)		
26	Gross beta ^(iv)		

⁽ⁱ⁾ Check monitoring is required only in respect of surface waters (see regulation 6(2) and Table 1 in Schedule 3)

⁽ⁱⁱ⁾ Sampling at treatment works when chloramination is practised.

^(iia) Sampling at treatment works when chloramination is not practised.

⁽ⁱⁱⁱ⁾ Audit monitoring at supply points is required only where sodium hypochlorite is not added after water has left the treatment works. In other circumstances, audit monitoring is required in water supply zones.

^(iv) To monitor for indicative dose (for radioactivity).”

SCHEDULE 3

Regulation 2(14)

“Schedule 5 Monitoring for indicative dose and analytical performance characteristics.

1. A water undertaker may use a screening strategy for gross alpha and gross beta to monitor for the parametric indicator value for indicative dose (a). The recommended screening value for gross alpha is 0.1Bq/l and for gross beta is 1.0Bq/l.

If the gross alpha activity is less than 0.1Bq/l and the gross beta activity is less than 1.0Bq/l it may be assumed that the indicative dose is less than 0.1mSv and radiological investigation is not needed, unless it is known from the other sources of information that specific radionuclides are present in water that are liable to cause an excess of 0.1mSv. Where the screening values are exceeded then additional radiological investigation is required.

The radionuclides to be measured must be based on all relevant information about likely sources of radioactivity.

2. Calculation of the ID

The ID must 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 Department, on the basis of the annual intake of water (730l) for adults. Where the following formula is satisfied, it can be assumed that the ID is less than the parametric value of 0.1mSv and no further investigation is required.

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

where

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

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

n = number of radionuclides detected.

Derived concentrations for radioactivity in water for human consumption⁽¹⁾		
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

(a) Where appropriate gross beta activity may be replaced by residual beta activity after subtraction of the K-40 activity concentration.

	Cs-134	7.2 Bq/l
	Cs-137	11 Bq/l
	I-131	6.2 Bq/l

⁽¹⁾ This table includes values for the most common natural and artificial radionuclides; these are precise values, calculated for a dose of 0.1mSV, an annual intake of 730 litre and using the dose coefficients laid down in Annex III Table A of Directive 96/29/Euratom; derived concentration 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.

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

3. Performance characteristics and method 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 ^{(1) (2)}
Tritium	10 Bq/l ⁽³⁾
Radon	10 Bq/l ⁽³⁾
gross alpha activity	0.04 Bq/l ⁽⁴⁾
gross beta activity	0.4 Bq/l ⁽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 ⁽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

⁽¹⁾ The limit of detection must be calculated according to the ISO standard 11929: 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 error of 1st and 2nd kind of 0.05 each

⁽²⁾ Measurement uncertainties must 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.

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

⁽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.

⁽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.”

EXPLANATORY NOTE

(This note is not part of the Regulations)

Regulation 2 amends the Water Supply (Water Quality) Regulations (Northern Ireland) 2007, as amended, to include an additional analytical parameter (radon), with associated threshold values and sampling frequency. In addition the regulation updates sampling frequencies for tritium and indicative dose (ID).

Regulation 2 also introduces the option to reduce the sampling frequencies in respect of radon, tritium and ID to zero based on a risk assessment, incorporating representative surveys, monitoring data, or other reliable information.

The regulation also updates references to Directive 89/106/EEC on the approximation of laws, regulations and administrative provisions of the Member States relating to construction products with references to Regulation (EU) No. 305/2011 of the European Parliament and of the Council laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC.

Regulation 3 amends the Water Supply (Water Fittings) Regulations (Northern Ireland) 2009 by updating references to Directive 89/106/EEC on the approximation of laws, regulations and administrative provisions of the Member States relating to construction products with references to Regulation (EU) No. 305/2011 of the European Parliament and of the Council laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC.

The table in Schedule 1 consolidates and presents in a single table the indicator parameters from Schedule 2 of the Water Supply (Water Quality) Regulations (Northern Ireland) 2007 as amended. The table adds radon as a further indicator parameter and sets a parametric value of 100 Bq/l.

Table 1 in Schedule 2 adds tritium, radon, and ID as parameters falling under the check monitoring requirement if measures have been put in place at a treatment works to reduce radionuclides.

Table 2 in Schedule 2 consolidates and presents in a single table the annual sampling frequencies for water supply zones contained in Table 2 of Schedule 3 to the Water Supply (Water Quality) Regulations (Northern Ireland) 2007, as amended, and adds radon with an appropriate sampling frequency.

Table 3 in Schedule 2 consolidates and presents in a single table the annual sampling frequencies for treatment works or supply points contained in Table 3 of Schedule 3 to the Water Supply (Water Quality) Regulations (Northern Ireland) 2007, as amended, and adds radon with an appropriate sampling frequency.

Schedule 3 inserts a new Schedule 5 into the Water Supply (Water Quality) Regulations (Northern Ireland) 2007. It details the steps for monitoring ID using gross alpha and gross beta as a screening strategy and outlines the additional analysis required if either gross alpha or gross beta is found to exceed the screening level. It also sets minimum limits of detection for analysis of a range of radionuclides.

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