

## SCHEDULE 1

Regulation 5

## Prescribed Concentrations and Values

## PART 1

## Wholesomeness

## TABLE A

## MICROBIOLOGICAL PARAMETERS

Prescribed concentrations and values

<i>Parameter</i>	<i>Parametric value</i> <i>(number/volume)</i>
Enterococci	0/100 ml
<i>Escherichia coli</i> ( <i>E.Coli</i> )	0/100 ml

## TABLE B

## CHEMICAL PARAMETERS

Prescribed concentrations and values

**Part I: Directive requirements -Prescribed concentrations and values**

<i>Parameter</i>	<i>Parametric value</i>	<i>Unit</i>
Acrylamide <sup>(1)</sup>	0.10	µg/l
Antimony	5.0	µg/l
Arsenic	10	µg/l
Benzene	1.0	µg/l
Benzo(a)pyrene	0.010	µg/l
Boron	1.0	mg/l
Bromate <sup>(2)</sup>	10	µg/l
Cadmium	5.0	µg/l
Chromium	50	µg/l
Copper	2.0	mg/l
Cyanide	50	µg/l
1,2-dichloroethane	3.0	µg/l
Epichlorohydrin <sup>(1)</sup>	0.10	µg/l
Fluoride	1.5	mg/l
Lead	10	µg/l

**Status:** This is the original version (as it was originally made).

<i>Parameter</i>	<i>Parametric value</i>	<i>Unit</i>
Mercury	1.0	µg/l
Nickel	20	µg/l
Nitrate <sup>(3)</sup>	50	mg/l
Nitrite <sup>(3)(4)</sup>	0.50	mg/l
	0.10 <sup>(4)</sup>	mg/l
Pesticides <sup>(5)(6)</sup> —		
Aldrin	0.030	µg/l
Dieldrin	0.030	µg/l
Heptachlor	0.030	µg/l
Heptachlor epoxide	0.030	µg/l
Other pesticide	0.10	µg/l
Pesticides: total <sup>(5)(7)</sup>	0.50	µg/l
Polycyclic aromatic hydrocarbons <sup>(8)</sup>	0.10	µg/l
Selenium	10	µg/l
Tetrachloroethene and trichloroethene <sup>(9)</sup>	10	µg/l
Trihalomethanes: total <sup>(9)(10)</sup>	100	µg/l
Vinyl chloride <sup>(1)</sup>	0.50	µg/l

- (1) The parametric value refers to the residual monomer concentration in the water as calculated according to specifications of the maximum release from the corresponding polymer in contact with the water. This is controlled by product specification.
- (2) Where possible, without compromising disinfection, a relevant person (in relation to a supply of water for human consumption purposes) must strive for a lower value.
- (3) See also the nitrate-nitrite formula in regulation 5(c).
- (4) The additional parametric value of 0.10 mg/l applies only if the water is subject to treatment to improve its quality. The point of compliance for this additional parametric value is the point at which the water flows out from the treatment works.
- (5) “Pesticide” means an organic insecticide, organic herbicide, organic fungicide, organic nematocide, organic acaricide, organic algicide, organic rodenticide, organic slimicide, a related product (including inter alia, growth regulator) and any relevant metabolite, degradation or reaction product. Only those pesticides which are likely to be present in a supply of water need to be monitored.
- (6) “Other pesticide” means a pesticide other than aldrin, dieldrin, heptachlor and heptachlor epoxide. The parametric value applies to each “other pesticide” individually.
- (7) The parametric value for this parameter is the sum of all individual pesticides detected and quantified in the monitoring procedure.
- (8) The parametric value for this parameter is the sum of the concentrations of benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(ghi)perylene and indeno(1,2,3-cd)pyrene.
- (9) The parametric value applies to the sum of the concentrations of the individual compounds detected and quantified in the monitoring process.
- (10) The specified compounds are chloroform, bromoform, dibromochloromethane, bromodichloromethane and the parametric value applies to the sum of the concentrations of the individual compounds detected and quantified in the monitoring process.

## Part II: National Requirements

Aluminium	200	µg/l
-----------	-----	------

Colour	20	mg/l Pt/Co
Iron	200	µg/l
Manganese	50	µg/l
Odour	Acceptable to consumers and no abnormal change	
Sodium	200	mg/l
Taste	Acceptable to consumers and no abnormal change	
Tetrachloromethane	3	µg/l
Turbidity	4	NTU

## PART 2

### Indicator Parameters

#### TABLE C

##### Prescribed concentrations and values

<i>Parameter</i>	<i>Parametric value</i>	<i>Unit</i>
Ammonium	0.50	mg/l
Chloride <sup>(1)</sup>	250	mg/l
<i>Clostridium perfringens</i> (including spores)	0	number/100 ml
Coliform bacteria	0	Number/100ml
Colony count 22 °C	No abnormal change	number/1 ml
Conductivity <sup>(1)</sup>	2500	µS/cm at 20 °C
Hydrogen ion concentration <sup>(1)</sup>	≥ 6.5 and ≤ 9.5	pH units
Indicative Dose (for radioactivity) <sup>(2)(3)(4)</sup>	0.10	mSv

(1) The water must not be aggressive.

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

(3) Where treatment to reduce the level of radionuclides in water intended for human consumption has been taken, monitoring must be carried out under Schedule 3 Part 1 to ensure efficacy of treatment.

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

(5) If tritium concentration exceeds its parametric value an investigation (which may include analysis) of the presence of other artificial radionuclides must be carried out.

(6) Remedial action is deemed to be justified on radiological ground without further consideration, where radon exceeds 1,000Bq/l.

(7) Only in the case of surface water treatment where the parametric value should be strived for the water ex-treatment works.

**Status:** This is the original version (as it was originally made).

<i>Parameter</i>	<i>Parametric value</i>	<i>Unit</i>
Sulphate <sup>(1)</sup>	250	mg/l
Radon (for radioactivity) <sup>(3)(6)</sup>	100	Bq/l
Total organic carbon	No abnormal change	mg/l
Tritium (for radioactivity) <sup>(3)(5)</sup>	100	Bq/l
Turbidity <sup>(7)</sup>	1	NTU

- (1) The water must not be aggressive.
- (2) Excluding tritium, potassium-40, radon and radon decay products.
- (3) Where treatment to reduce the level of radionuclides in water intended for human consumption has been taken, monitoring must be carried out under Schedule 3 Part 1 to ensure efficacy of treatment.
- (4) If the gross alpha activity exceeds 0.1Bq/l or the gross beta activity exceeds 1.0Bq/l analysis for specific radionuclides is required.
- (5) If tritium concentration exceeds its parametric value an investigation (which may include analysis) of the presence of other artificial radionuclides must be carried out.
- (6) Remedial action is deemed to be justified on radiological ground without further consideration, where radon exceeds 1,000Bq/l.
- (7) Only in the case of surface water treatment where the parametric value should be strived for the water ex-treatment works.

## SCHEDULE 2

Regulation 9

### Monitoring Programmes

#### Monitoring programmes

1.—(1) A monitoring programme for a private water supply established under regulation 9 must—

- (a) verify that—
    - (i) the measures in place to control risks to human health throughout the water supply chain (from the catchment area through abstraction, treatment and storage to distribution) are working effectively; and
    - (ii) water at the point of compliance is wholesome;
  - (b) subject to regulation 11, provide information on the quality of water supplied for human consumption to—
    - (i) demonstrate whether or not the water complies with prescribed concentrations and values for parameters in Schedule 1;
    - (ii) determine the organoleptic and microbiological quality of the water; and
    - (iii) establish the effectiveness of the treatment of the water, particularly of disinfection where it is used.
  - (c) identify the most appropriate means of mitigating any risk to human health.
  - (d) have regard to Schedule 3.
- (2) A monitoring programme must consist of either—
- (a) the collection and analysis of discrete water samples; or
  - (b) measurement recorded by a continuous monitoring process,

or a combination of both of the methods described in sub-paragraphs (a) and (b).

(3) In addition, monitoring programmes may consist of—

- (a) inspections of records of the functionality and maintenance status of equipment; and
- (b) inspections of the catchment area, water abstraction, treatment, storage and distribution infrastructure.

(4) The monitoring programme may be based on the findings of a risk assessment as set out in regulation 7.

(5) When choosing appropriate parameters and other micro-organisms, parasites or substances for monitoring programmes, local conditions for each private water supply system must be taken into consideration.

### SCHEDULE 3

Regulation 10

#### Monitoring for Group A and Group B Parameters

#### Part 1

#### Monitoring for Group A parameters

#### Sampling

1.—(1) The Department must monitor for a Group A parameter in accordance with this Part.

(2) “Monitoring for a Group A parameter” means sampling for—

- (a) each parameter listed in column 1 of Table 1 of this Schedule in the circumstances listed in the entry which corresponds with that parameter in column 2 of Table 1 of this Schedule; and
- (b) any other parameter which may be identified as relevant by the Department in the monitoring programme.

**TABLE 1**

#### Group A parameters

<i>(1) Parameter</i>	<i>(2) Circumstances</i>
Aluminium <sup>(1)</sup>	If used as water treatment chemicals or where the water originates from, or is influenced by, surface waters
Ammonium	Where chloramination is practised
Coliform bacteria	In all supplies
Colony Counts	In all supplies
Colour	In all supplies
Conductivity	In all supplies

(1) A supply which consists of both groundwater and surface water shall be deemed to be a supply which consists only of surface water.

**Status:** This is the original version (as it was originally made).

<i>(1) Parameter</i>	<i>(2) Circumstances</i>
Disinfectant residual	When disinfection treatment is practised
<i>Escherichia coli (E. coli)</i>	In all supplies
Indicative Dose	Where there is treatment in place to reduce the level of radionuclides in water intended for human consumption.
Iron <sup>(1)</sup>	If used as water treatment chemicals or where the water originates from, or is influenced by, surface waters
Manganese <sup>(1)</sup>	Where the water originates from, or is influenced by, surface waters
Nitrite	Where chloramination is practised
Odour	In all supplies
pH (Hydrogen ion)	In all supplies
Radon	Where there is treatment in place to reduce the level of radionuclides in water intended for human consumption.
Taste	In all supplies
Tritium	Where there is treatment in place to reduce the level of radionuclides in water intended for human consumption.
Turbidity	In all supplies

(1) A supply which consists of both groundwater and surface water shall be deemed to be a supply which consists only of surface water.

2.—(1) Sampling for a Group A parameter which is not a radioactive substance must be undertaken at the frequencies specified in Table 2 for those parameters.

(2) Sampling for a Group A parameter which is a radioactive substance must be undertaken at the frequencies specified in Table 3 for those parameters.

**TABLE 2**

**Sampling frequency of sampling for Group A parameters (non radioactive substances)**

<i>Volume m<sup>3</sup>/day(calculated as averages taken over a calendar year)</i>	<i>Sampling frequency per year</i>
≤10	1
> 10 ≤ 100	2
> 100 ≤ 1,000	4
> 1,000 ≤ 2,000	10
> 2,000 ≤ 3,000	13
> 3,000 ≤ 4,000	16
> 4,000 ≤ 5,000	19
> 5,000 ≤ 6,000	22
> 6,000 ≤ 7,000	25

<i>Volume m<sup>3</sup>/day(calculated as averages taken over a calendar year)</i>	<i>Sampling frequency per year</i>
> 7,000 ≤ 8,000	28
> 8,000 ≤ 9,000	31
> 9,000 ≤ 10,000	34
> 10,000	4 + 3 for each 1,000 m <sup>3</sup> /day of the total volume (rounding up to the nearest multiple of 1,000 m <sup>3</sup> /day)

**TABLE 3**

**Minimum frequency of sampling for Group A monitoring radioactive substances**

<i>Volume m<sup>3</sup> /day (calculated as averages taken over a calendar year)</i>	<i>Sampling frequency per year</i>
≤ 1000	1
> 1000 ≤ 10,000	1 + 1 for each 3,300 m <sup>3</sup> /day of the total volume (rounding up to the nearest multiple of 3,300 m <sup>3</sup> /day)
> 10,000 ≤ 100,000	3 + 1 for each 10,000 m <sup>3</sup> /day of the total volume (rounding up to the nearest multiple of 10,000 m <sup>3</sup> /day)
> 100,000	10 + 1 for each 25,000 m <sup>3</sup> /day of the total volume (rounding up to the nearest multiple of 25,000 m <sup>3</sup> /day)

**PART 2**

**Monitoring for Group B Parameters**

**Sampling**

3.—(1) The Department must monitor for a Group B parameter in accordance with this Part.

(2) “Monitoring for a Group B parameter” means sampling for each parameter listed in Schedule 1 (other than parameters already being monitored for Group A parameter monitoring).

**Frequency of sampling**

4.—(1) Sampling for a Group B parameter must be undertaken at the frequencies specified in Table 4 for those parameters.

*Status: This is the original version (as it was originally made).*

**TABLE 4**

**Minimum frequency of sampling for Group B parameters**

<i>Volume m<sup>3</sup> /day (calculated as averages taken over a calendar year)</i>	<i>Sampling frequency per year</i>
≤ 1000	1
> 1000 ≤ 10,000	1 + 1 for each 3,300 m <sup>3</sup> /day of the total volume (rounding up to the nearest multiple of 3,300 m <sup>3</sup> /day)
> 10,000 ≤ 100,000	3 + 1 for each 10,000 m <sup>3</sup> /day of the total volume (rounding up to the nearest multiple of 10,000 m <sup>3</sup> /day)
> 100,000	10 + 1 for each 25,000 m <sup>3</sup> /day of the total volume (rounding up to the nearest multiple of 25,000 m <sup>3</sup> /day)

**PART 3**

**Deviation from monitoring requirements of Group A and Group B monitoring**

**Deviation from standard parameters and frequencies**

5.—(1) The Department may, provided that a risk assessment is performed in accordance with regulation 7 and subject to paragraphs (6) and (7) deviate from the requirements of Group A and Group B monitoring required by this Schedule.

(2) Based on the results of a risk assessment and in accordance with paragraph (1), the list of parameters in this Schedule including any other micro-organism, parasite or substance included in the Group A or Group B parameters (except radon, tritium and indicative dose), must be extended and/or the minimum sampling frequencies in this Schedule increased by the Department if the list of parameters, substances or microorganisms or frequencies required to be monitored is not sufficient to;

- (a) be representative of the water consumed throughout the year;
- (b) verify that the obligations imposed by regulation 6(2) have been met;
- (c) ensure the obligations in paragraph 1(1)(a) of Schedule 2 have been met;
- (d) verify that the requirements of regulation 5(a) have been met.

(3) In accordance with paragraph (1) and subject to paragraphs (4) and (5) the sampling frequency for a parameter in this Schedule including any other micro-organism, parasite or substance included in the Group A or Group B parameters (except radon, tritium and indicative dose), may be reduced or the parameter removed (except radon, tritium and indicative dose) from the list of parameters to be monitored under this Schedule provided that the following conditions are met—

- (a) the monitoring for *Escherichia coli* (*E. Coli.*) is not removed from the monitoring programme and the frequency of monitoring is not reduced below the frequency required by this Schedule ; and
- (b) for other parameters in the list—
  - (i) the location and frequency of sampling is determined in relation to the parameter's origin, as well as the variability and long term trend of its concentration, taking into account the prescribed concentration and values in Schedule 1;

- (ii) to reduce the sampling frequency for a parameter under this Schedule, the results obtained from samples collected at regular intervals over a period of at least 3 years must all be less than 60% of the prescribed concentration or value for the parameter;
- (iii) to remove a parameter from the list of parameters to be monitored under this Schedule the results obtained from samples collected at regular intervals over a period of at least 3 years must all be less than 30% of the prescribed concentration or value of the parameter; and
- (iv) to remove a parameter from the list of parameters to be monitored under this Schedule must be based on the result of a risk assessment, informed by the results of monitoring of sources of water under these Regulations and subject to confirmation that human health is protected from the adverse effects of any contamination of water.

(4) The sampling frequency for a parameter under this Schedule including any other micro-organism, parasite or substance included in the Group A or Group B parameters (except radon, tritium and indicative dose) may be reduced under paragraph (3)(b)(ii) only if the risk assessment confirms that no factor (that can be reasonably anticipated) is likely to cause deterioration of the quality of the water.

(5) Any such parameter may be removed from the list of parameters to be monitored under paragraph (3)(b)(iii) only if the risk assessment confirms that no factor (that can be reasonably anticipated) is likely to cause deterioration of the quality of the water.

(6) In the 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 Tables 3 and 4, may be reduced, taking into consideration the risk to human health.

(7) The Department is not required to monitor private supplies for radon or tritium or to establish the ID for a period of time to be determined by the Department, where it is satisfied on the basis of representative surveys carried out under regulation 8, monitoring data or other reliable information that the levels of radon, tritium or of the calculated ID will remain well below the respective parametric values or specifications.

(8) A notice of a decision not to monitor under sub-paragraph (7) along with supporting evidence for the decision including any representative surveys carried out under regulation 8, monitoring data or other reliable information must be communicated to the European Commission.

## SCHEDULE 4

Regulation 12

### Sampling and Analysis

## PART 1

### General

#### **Samples: general**

1. The Department must ensure that each sample taken in accordance with a monitoring programme is—

- (a) representative of the water at the sampling point at the time of sampling;
- (b) not contaminated in the course of being taken;

*Status: This is the original version (as it was originally made).*

- (c) for the chemical parameters copper, lead and nickel taken without prior flushing and is a random daytime sample of one litre volume;
- (d) for chemical parameters in the distribution network be undertaken in accordance with ISO 5667-5, other than where the sample is taken from a consumer's tap;
- (e) for microbiological parameters taken and handled according to EN ISO 19458, sampling purpose A and B;
- (f) kept at such temperature and in such conditions as will secure that there is no material alteration of a concentration, value or state of any parameter/measurement/observation for which the sample is to be analysed; and
- (g) analysed as soon as may be possible after it has been taken—
  - (i) by a person who is competent to perform that task; and
  - (ii) with the use of such equipment as is suitable for the purpose.

### **Analysing samples**

2.—(1) The Department must ensure each sample is analysed in accordance with this paragraph and that analysis methods used are validated and documented in accordance with EN ISO/IEC 17025 or other equivalent standards accepted at an international level.

(2) For each parameter specified in the first column of Table A in Part 2 of this Schedule “Table A” the method of analysis is specified in the second column of that table.

(3) For each parameter specified in the first column of Table B in Part 2 of this Schedule “Table B” the method of analysis must be capable of measuring concentrations equal to the parametric value with a limit of quantification of 30% or less of the relevant parametric value set in Schedule 1 and an uncertainty of measurement as specified in Table B.

(4) The Department must not use the uncertainty of measurement in Table B as an additional tolerance to the parametric values set in Schedule 1.

(5) For hydrogen ion, a method of analysis which is capable at the time of use of measuring a value with a trueness of 0.2 pH unit and a precision of 0.2 pH unit.

(6) The result of analysis of parameters under this regulation must be expressed using at least the same number of significant figures as for the associated parametric values in Part 1 of Schedule 1.

(7) For these purposes—

“limit of quantification” is to be calculated using an appropriate standard or sample, and may be obtained from the lowest calibration point on the calibration curve, excluding the blank; and

“measurement uncertainty” shall be estimated at the level of the parametric value, unless otherwise specified.

### **Authorisation of alternative methods of analysis**

3.—(1) If the Department is satisfied that an alternative method of analysis is at least as reliable as a method of analysis prescribed by paragraph 2(2), it may authorise its use instead of the prescribed method.

(2) The Department shall provide the European Commission with relevant information concerning such methods authorised in paragraph 3(1) and their equivalence.

(3) Until 31 December 2019 the Department may use “trueness”, “precision” and “limit of detection” as specified in Table C in Part 2 of this Schedule (“Table C”) as alternative sets of performance characteristics to “limit of quantification” and “uncertainty of measurement” specified in paragraph 6 and Table B of this Schedule.

(4) For the purposes of this paragraph the method of analysis for each parameter specified in the first column of Table C must be capable of—

- (a) measuring concentrations and values with the trueness and precision specified in the second and third columns of that table; and
- (b) detecting the parameter at the limit of detection specified in the fourth column of that table.

(5) For hydrogen ion, a method of analysis must be capable at the time of use of measuring a value with a trueness of 0.2 pH unit and a precision of 0.2 pH unit.

(6) For these purposes—

“limit of detection” is to be calculated as—

- (a) three times the relative within-batch standard deviation of a natural sample containing a low concentration of the parameter; or
- (b) five times the relative within-batch standard deviation of a blank sample;

“precision” (the random error) is to be calculated as twice the standard deviation (within a batch and between batches) of the spread of results about the mean; and

“trueness” (the systematic error) is to be calculated as the difference between the mean value of the large number of repeated measurements and the true value.

(7) In the absence of an analytical method meeting the minimum performance criteria set out in sub-paragraph (3) and paragraph 2(3) the Department must ensure that monitoring is carried out using best available techniques not entailing excessive costs.

**Laboratories**

4. The Department must ensure that the laboratory at which samples are analysed has a system of analytical quality control in accordance with EN ISO/IEC 17025 or other equivalent standards accepted at an international level and is subjected from time to time to checking by a person who is—

- (a) not under the control of either the laboratory or the Department; and
- (b) approved by the Department for that purpose.

**Interpretation**

5. In this schedule—

“laboratory” includes any land at which samples are analysed for the purposes of these Regulations (including on-site analysis); and

“taking and analysing samples” includes taking, handling, transporting, storing and analysing samples.

**PART 2**

**Analytical Methods and Performance Characteristics**

**TABLE A**

**Prescribed methods of analysis**

<i>(1) Parameter</i>	<i>(2) Method</i>
<i>Clostridium perfringens</i> (including spores)	EN ISO 14189

**Status:** This is the original version (as it was originally made).

<i>(1) Parameter</i>	<i>(2) Method</i>
Coliform bacteria	EN ISO 9308-1 or EN ISO 9308-2
Colony count 22°C-enumeration of culturable microorganisms	EN ISO 6222
<i>Enterococci</i>	EN ISO 7899-2
<i>Escherichia coli (E. coli)</i>	EN ISO 9308-1 or EN ISO 9308-2
<i>Pseudomonas aeruginosa</i>	EN ISO 16266

**TABLE B**

**Minimum performance characteristic: “uncertainty of measurement”**

<i>(1) Parameter<sup>(1)</sup></i>	<i>(2) Uncertainty of measurement (% of parametric value, except pH)<sup>(2)</sup></i>
Aluminium	25
Ammonium	40
Antimony	40
Arsenic	30
Benzo(a)pyrene <sup>(3)</sup>	50
Benzene	40
Boron	25
Bromate	40
Cadmium	25
Chloride	15
Chromium	30
Colour	20
Conductivity	20
Copper	25
Cyanide <sup>(4)</sup>	30
1,2-dichloroethane	40
Fluoride	20
Hydrogen ion concentration pH (expressed in pH units) <sup>(5)</sup>	0.2
Iron	30
Lead	25
Manganese	30
Mercury	30

<i>(1) Parameter<sup>(1)</sup></i>	<i>(2) Uncertainty of measurement (% of parametric value, except pH)<sup>(2)</sup></i>
Nickel	25
Nitrate	15
Nitrite	20
Oxidisability <sup>(6)</sup>	50
Pesticides <sup>(7)</sup>	30
Polycyclic aromatic hydrocarbons <sup>(8)</sup>	50
Selenium	40
Sodium	15
Sulphate	15
Tetrachloroethene <sup>(9)</sup>	30
Tetrachloromethane	30
Trichloroethene <sup>(9)</sup>	40
Trihalomethanes: total <sup>(8)</sup>	40
Total organic carbon <sup>(10)</sup>	30
Turbidity <sup>(11)</sup>	30

- (1) Acrylamide, epichlorohydrin and vinyl chloride to be controlled by product specification.
- (2) Uncertainty of measurement is a non-negative parameter characterising the dispersion of the quantity values being attributed to a measurand, based on the information used. The performance criterion for measurement uncertainty ( $k = 2$ ) is the percentage of the parametric value stated in the table or better. Measurement uncertainty must be estimated at the level of the parametric value, unless otherwise specified.
- (3) If the value of uncertainty of measurement cannot be met, the best available technique should be selected (up to 60%).
- (4) The method determines total cyanide in all forms.
- (5) Values for trueness, precision and uncertainty of measurement are expressed in pH units.
- (6) Reference method EN ISO 8467.
- (7) The performance characteristics for individual pesticides are given as an indication. Values for the uncertainty of measurement as low as 30% can be achieved for several pesticides, higher values up to 80% may be allowed for a number of pesticides.
- (8) The performance characteristics apply to individual substances, specified at 25% of the parametric value in Table B of Schedule 1.
- (9) The performance characteristics apply to individual substances, specified at 50% of the parametric value in Table B of Schedule 1.
- (10) The uncertainty of measurement should be estimated at the level of 3 mg/l of the total organic carbon. CEN 1484 Guidelines for the determination of total organic carbon and dissolved organic carbon must be used.
- (11) The uncertainty of measurement must be estimated at the level of 1.0 NTU (nephelometric turbidity units) in accordance with EN ISO 7027.

**Status:** This is the original version (as it was originally made).

**TABLE C**

**Minimum performance characteristics: trueness, precision and limit of detection- may be used until 31 December 2019**

<i>(1) Parameter<sup>(1)</sup></i>	<i>(2) Trueness (% of parametric value, except for pH)<sup>(2)</sup></i>	<i>(3) Precision (% of parametric value, except for pH)<sup>(3)</sup></i>	<i>(4) Limit of detection (% of parametric value, except for pH)<sup>(4)</sup></i>
Aluminium	10	10	10
Ammonium	10	10	10
Antimony	25	25	25
Arsenic	10	10	10
Benzene	25	25	25
Benzo(a)pyrene	25	25	25
Boron	10	10	10
Bromate	25	25	25
Cadmium	10	10	10
Chloride	10	10	10
Chromium	10	10	10
Colour	10	10	10
Conductivity	10	10	10
Copper	10	10	10
Cyanide <sup>(5)</sup>	10	10	10
1,2-dichloroethane	25	25	10
Fluoride	10	10	10
Hydrogen ion concentration pH (expressed in pH units) <sup>(6)</sup>	0.2	0.2	
Iron	10	10	10
Lead	10	10	10
Manganese	10	10	10
Mercury	20	10	20
Nickel	10	10	10
Nitrate	10	10	10
Nitrite	10	10	10
Oxidisability <sup>(7)</sup>	50	25	10

**Status:** This is the original version (as it was originally made).

<i>(1) Parameter<sup>(1)</sup></i>	<i>(2) Trueness  (% of parametric value, except for pH)<sup>(2)</sup></i>	<i>(3) Precision  (% of parametric value, except for pH)<sup>(3)</sup></i>	<i>(4) Limit of detection  (% of parametric value, except for pH)<sup>(4)</sup></i>
Pesticides <sup>(8)</sup>	25	25	25
Polycyclic aromatic hydrocarbons <sup>(9)</sup>	25	25	25
Selenium	10	10	10
Sodium	10	10	10
Sulphate	10	10	10
Tetrachloroethene <sup>(10)</sup>	25	25	10
Tetrachloromethane	20	20	20
Trichloroethene <sup>(10)</sup>	25	25	10
Trihalomethanes: total <sup>(9)</sup>	25	25	10
Turbidity <sup>(11)</sup>	10	10	10
Turbidity <sup>(12)</sup>	25	25	25

(1) Acrylamide, epichlorohydrin and vinyl chloride to be controlled by product specification.

(2) Trueness is a measure of systematic error, i.e. the difference between the mean value of the large number of repeated measurements and the true value. Further specifications are those set out in ISO 5725.

(3) Precision is a measure of random error and is usually expressed as the standard deviation (within and between batches) of the spread of results from the mean. Acceptable precision is twice the relative standard deviation. This term is further specified in ISO 5725.

(4) Limit of detection is either three times the standard deviation within a batch of a natural sample containing a low concentration of the parameter; or five times the standard deviation of a blank sample (within a batch).

(5) The method determines total cyanide in all forms.

(6) Values for trueness, precision and uncertainty of measurement are expressed in pH units.

(7) Reference method EN ISO 8467.

(8) The performance characteristics for individual pesticides are given as an indication. Values for the uncertainty of measurement as low as 30% can be achieved for several pesticides, higher values up to 80 % may be allowed for a number of pesticides.

(9) The performance characteristics apply to individual substances, specified at 25% of the parametric value in Table B of Schedule 1.

(10) The performance characteristics apply to individual substances, specified at 50% of the parametric value in Table B of Schedule 1.

(11) The performance characteristics apply to prescribed value 4 NTU.

(12) The performance characteristics apply to prescribed value 1 NTU for water leaving surface water treatment works.

## PART 3

### Monitoring for Indicative Dose and Analytical Performance Characteristics

#### Monitoring for Compliance with the ID

6. Screening strategy for gross alpha activity and gross beta activity (1) may be used to monitor for the parametric indicator value for indicative dose.

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

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

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

#### Calculation of the ID

7. 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(2) 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.

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

where

$C_i(\text{obs})$  = observed concentration of radionuclide  $i$

$C_i(\text{der})$  = derived concentration of radionuclide  $i$  (see Table D)

$n$  = number of radionuclides detected.

**TABLE D**

#### Derived concentrations for radioactivity in water intended for human consumption

<i>Origin</i>	<i>Radionuclide<sup>(1)</sup></i>	<i>Derived concentration (Bq/l)</i>
Natural	U-238 <sup>(2)</sup>	3.0
	U-234 <sup>(2)</sup>	2.8

(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 litres 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 Department.

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

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

(2) O.J. No. L159, 29.6.96, P. 27

<i>Origin</i>	<i>Radionuclide<sup>(1)</sup></i>	<i>Derived concentration (Bq/l)</i>
	Ra-226	0.5
	Ra-228	0.2
	Pb-210	0.2
	Po-210	0.1
Artificial	C-14	240
	Sr-90	4.9
	Pu-239 / Pu-240	0.6
	Am-241	0.7
	Co-60	40
	Cs-134	7.2
	Cs-137	11
	I-131	6.2

(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 litres 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 Department.

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

### Performance characteristics and method of analysis.

8. 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 in Table E:

**TABLE E**

<i>Parameters and radiouclides</i>	<i>Limit of detection<sup>(1)(2)</sup></i>
Tritium	10 Bg/l <sup>(3)</sup>
Radon	10 Bg/l <sup>(3)</sup>
gross alpha activity	0.04 Bg/l <sup>(4)</sup>
gross beta activity	0.4 Bg/l <sup>(4)</sup>
U-238	0.02 Bg/l
U-234	0.02 Bg/l
Ra-226	0.04 Bg/l
Ra-228	0.02 Bg/l <sup>(5)</sup>
Pb-210	0.02 Bg/l
Po-210	0.01 Bg/l
C-14	20 Bg/l

*Status: This is the original version (as it was originally made).*

<i>Parameters and radiouclides</i>	<i>Limit of detection<sup>(1)(2)</sup></i>
Sr-90	0.4 Bg/l
Pu-239/Pu-240	0.04 Bg/l
Am-241	0.06 Bg/l
Co-60	0.5 Bg/l
Cs-134	0.5 Bg/l
Cs-137	0.5 Bg/l
I-131	0.5 Bg/l

- (1) The limit of detection must be calculated according to the ISO standard 11929:2010 entitled “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.
- (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 IEC Guide 98-3:2008 entitled “Guide to the expression of uncertainty in measurement”.
- (3) The limit of detection for tritium and for radon is 10% of the corresponding parametric value of 100 Bg/l.
- (4) The limit of detection for gross alpha activity and gross beta activities is 40% of the screening values of 0.1 Bq/l and 1.0 Bq/l respectively.
- (5) This limit of detection applies only to initial screening for indicative dose for a new water source. If initial checking indicates that it is unlikely 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.

## SCHEDULE 5

Regulation 13

### Records

- 1.—(1) The Department must compile records to include—
  - (a) the name and address of every relevant person for the land or private supply;
  - (b) the location and description of the private supply;
  - (c) an eight figure ordnance survey grid reference of the location of the source of supply;
  - (d) a description of the source;
  - (e) the addresses of the land supplied by the private supply;
  - (f) a plan of the private supply showing the sources and land supplied;
  - (g) the purposes for which the water is supplied;
  - (h) the estimated average daily volume of water supplied;
  - (i) an estimate of the numbers of people served by the supply;
  - (j) any drinking-water treatment to which the supply is subject;
  - (k) the monitoring programme for the supply;
  - (l) the details contained within each risk assessment carried out under regulation 7, including a summary of its results.
- (2) The Department must review and update the record at least once a year.
- (3) The Department must keep the record for at least thirty years.

2.—(1) For each private supply the Department must record each of the following within 28 days of the event—

- (a) date and results of any sampling and analysis relating to that supply;
- (b) sufficient records to show that the requirements of regulations 7, 8 and 9 and Schedules 2, 3 and 4 have been satisfied;
- (c) the results of any investigation undertaken in accordance with these Regulations;
- (d) any authorisation;
- (e) any action taken or required to be taken by any person under these Regulations;
- (f) any action taken or required to be taken following a notice served under Article 119 of the Water and Sewerage Services (Northern Ireland) Order 2006<sup>(3)</sup>;
- (g) in respect of any risk assessment, the date and results of any inspection of the supply and the results of analysis of samples taken for the purposes of the assessment;
- (h) any notices served under these Regulations;
- (i) any request for the Department to carry out sampling and analysis, undertake a risk assessment or give advice;
- (j) a summary of any advice given in relation to the supply; and
- (k) such other particulars as the Department may determine.

(2) The Department must keep the records of sampling and analysis for at least 30 years, and all other records under this paragraph for at least 10 years.

---

(3) SI 2006/3336 (N.I. 21)