ANNEX II

MONITORING

Part A

General objectives and monitoring programmes for water intended for human consumption

1. Monitoring programmes established pursuant to Article 13(2) for water intended for human consumption shall:

(a) verify that the measures in place to control risks to human health throughout the water supply chain from the abstraction area through treatment and storage to distribution are working effectively and that water intended for human consumption at the point of compliance is wholesome and clean;

(b) provide information on the quality of water supplied for human consumption to demonstrate that the obligations set out in Article 4 and the parametric values set in accordance with Article 5 are being met;

(c) identify the most appropriate means of mitigating the risk to human health.

2. Monitoring programmes established pursuant to Article 13(2) shall include one or a combination of the following:

(a) collection and analysis of discrete water samples;

(b) measurements recorded by a continuous monitoring process.

In addition, monitoring programmes may consist of:

(a) inspections of records of the functionality and maintenance status of equipment;

(b) inspections of the abstraction area, and of the treatment, storage and distribution infrastructure, without prejudice to monitoring requirements provided for under point (c) of the first subparagraph of Article 8(2) and point (b) of the first subparagraph of Article 10(1).

3. Monitoring programmes shall also include an operational monitoring programme that provides rapid insight into operational performance and water quality problems and that allows rapid pre-planned remedial action. Such operational monitoring programmes shall be supply-specific, taking into account the outcomes of the identification of hazards and hazardous events and the risk assessment of the supply system, and shall be intended to confirm the effectiveness of all control measures in abstraction, treatment, distribution and storage.

The operational monitoring programme shall include the monitoring of the parameter ‘turbidity at the water supply plant’ in order to regularly control the efficacy of physical removal by filtration processes, in accordance with the reference values and frequencies indicated in the following table (not applicable for groundwater sources where turbidity is caused by iron and manganese):

Operational parameter	**Reference value**

turbidity at the water supply plant	0,3 NTU in 95 % of samples and none to exceed 1 NTU
Volume (m^3) of water distributed or produced each day within a supply zone	Minimum frequency of sampling and analysis
≤ 1 000	Weekly
> 1 000 to ≤ 10 000	Daily
> 10 000	Continuous

The operational monitoring programme shall also include the monitoring of the following parameters in raw water to control the efficacy of the treatment processes against microbiological risks:

Operational parameter	**Reference value**	**Unit**	**Notes**
Somatic coliphages	50 (for raw water)	Plaque Forming Units (PFU)/100 ml	This parameter shall be measured if the risk assessment indicates that it is appropriate to do so. If it is found in raw water at concentrations > 50 PFU/100 ml, it should be analysed after steps of the treatment train in order to determine log removal by the barriers in place and to assess whether the risk of a breakthrough of pathogenic viruses is sufficiently under control.

4. Member States shall ensure that monitoring programmes are reviewed on a continuous basis and updated or confirmed at least every six years.

Part B

Parameters and sampling frequencies

1. List of parameters

Group A

The following parameters (Group A) shall be monitored in accordance with the monitoring frequencies set out in Table 1 of point 2:

(a) *Escherichia coli* (*E. coli*), intestinal enterococci, coliform bacteria, colony count 22 °C, colour, turbidity, taste, odour, pH and conductivity;

(b) other parameters identified as relevant in the monitoring programme, in accordance with Article 5(3) and, where relevant, through a risk assessment of the supply system as set out in Article 9 and Part C of this Annex.

Under specific circumstances, the following parameters shall be added to the Group A parameters:

(a) ammonium and nitrite, if chloramination is used;

(b) aluminium and iron, if used as water treatment chemicals.

Escherichia coli (*E. coli*) and intestinal enterococci are considered ‘core parameters’ and their monitoring frequencies shall not be the subject of a reduction due to a risk assessment of the supply system in accordance with Article 9 and Part C of this Annex. They shall always be monitored at least at the frequencies set out in Table 1 of point 2.

Group B

In order to determine compliance with all parametric values set out in this Directive, all other parameters not analysed under Group A and set in accordance with Article 5, except for parameters in Part D of Annex I, shall be monitored at least at the frequencies set out in Table 1 of point 2, unless a different sampling frequency is determined on the basis of a risk assessment of the supply system carried out in accordance with Article 9 and Part C of this Annex.

2. Sampling frequencies

Table 1. Minimum frequency of sampling and analysis for compliance monitoring

Volume of water distributed or produced each day within a supply zone(See Notes 1 and 2) m^3		**Group A parameternumber of samples per year**	**Group B parameternumber of samples per year**
	< 10	> 0 (See Note 4)	> 0 (See Note 4)
≥ 10	≤ 100	2	1 (See Note 5)
> 100	≤ 1 000	4	1
> 1 000	≤ 10 000	4 for the first 1 000 m^3/d + 3 for each additional 1 000 m^3/d and part thereof of the total volume (See Note 3)	1 for the first 1 000 m^3/d + 1 for each additional 4 500 m^3/d and part thereof of the total volume (See Note 3)
> 10 000	≤ 100 000		3 for first 10 000 m^3/d + 1 for each additional 10 000 m^3/d and part thereof of the total volume (See Note 3)

Table 1. Minimum frequency of sampling and analysis for compliance monitoring

> 100 000			12 for first 100 000 m^3/d + 1 for each additional 25 000 m^3/d and part thereof of the total volume (See Note 3)

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 the water quality can 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 water consumption of 200 l/(day*capita).

Note 3: The frequency indicated is calculated as follows: e.g. 4 300 m^3/d = 16 samples for Group A parameters (four for the first 1 000 m^3/d + 12 for additional 3 300 m^3/d).

Note 4: For water suppliers, where an exemption has not been granted under point (b) of Article 3(3), Member States shall lay down the minimum sampling frequency for parameters of Groups A and B, provided that core parameters are monitored at least once per year.

Note 5: Member States may reduce the sampling frequency, provided that all parameters set in accordance with Article 5 are monitored at least once every six years and are monitored in cases where a new water source is integrated into the water supply system or changes to that system, as a result of which a potentially adverse effect on the quality of water is to be expected, are made.

Part C

Risk assessment and risk management of the supply system

1. Based on the outcome of the risk assessment of the supply system as referred to in Article 9, the list of parameters considered in the monitoring shall be extended and the sampling frequencies set out in Part B increased where any of the following conditions is fulfilled:

(a) the list of parameters or frequencies set out in this Annex is not sufficient to fulfil the obligations imposed under Article 13(1);

(b) additional monitoring is required for the purposes of Article 13(5);

(c) it is necessary to provide the assurances set out in point (a) of point 1 of Part A;

(d) increasing the sampling frequencies is necessary pursuant to point (a) of the first subparagraph of Article 8(4).

2. As a result of a risk assessment of the supply system, the list of parameters considered in the monitoring and the sampling frequencies set out in Part B may be reduced provided that all of the following conditions are met:

(a) the location and frequency of sampling is determined in relation to the parameter's origin, as well as the variability of, and long-term trend regarding, its concentration, taking into account Article 6;

(b) as regards reducing the minimum sampling frequency of a parameter, the results obtained from samples collected at regular intervals over a period of at least three years, from sampling points representative of the whole supply zone, are all less than 60 % of the parametric value;

(c) as regards removing a parameter from the list of parameters to be monitored, the results obtained from samples collected at regular intervals over a period of at least three years, from sampling points representative of the whole supply zone, are all less than 30 % of the parametric value;

(d) as regards removing a parameter from the list of parameters to be monitored, the decision is based on the outcome of the risk assessment that takes into account the results of monitoring of sources of water intended for human consumption and confirms that human health is protected from the adverse effects of any contamination of water intended for human consumption, as laid down in Article 1;

(e) as regards reducing the sampling frequency of a parameter or removing a parameter from the list of parameters to be monitored, the risk assessment confirms that no factor that can be reasonably anticipated is likely to cause deterioration of the quality of the water intended for human consumption.

Where monitoring results, demonstrating that the conditions set out in points (2)(b) to (2)(e) are met, are already available by 12 January 2021, those monitoring results may, from that date, be used to adapt the monitoring following the risk assessment of the supply system.

Where adjustments of monitoring have already been implemented following risk assessment of the supply system in accordance, inter alia, with Part C of Annex II of Directive 98/83/EC, Member States may provide for the possibility to confirm their validity without requiring monitoring in accordance with point 2(b) and 2(c) over a further period of at least three years from points representative of the whole supply zone.

Part D

Sampling methods and sampling points

1. Sampling points shall be determined so as to ensure compliance with Article 6(1). In the case of a distribution network, a Member State may take samples within the supply zone or at the treatment works for particular parameters if it can be demonstrated that there would be no adverse change to the measured value of the parameters concerned. As far as possible, the number of samples shall be distributed equally in time and location.

2. Sampling at the point of compliance shall meet the following requirements:

(a) compliance samples for certain chemical parameters, in particular copper, lead, and nickel, shall be taken at the consumers' tap without prior flushing. A random daytime sample of one litre volume is to be taken. As an alternative, Member States may use fixed stagnation time methods that better reflect their national situation, such as the average weekly intake by consumers, provided that, at the supply zone level, this does not result in fewer cases of non-compliance than using the random daytime method;

(b) compliance samples for microbiological parameters at the point of compliance shall be taken and handled in accordance with EN ISO 19458, sampling purpose B.

3. Samples for *Legionella* in domestic distribution systems shall be taken at risk points for proliferation of *Legionella*, points representative for systemic exposure to *Legionella,* or both. Member States shall establish guidelines for sampling methods for *Legionella*.

4. Sampling in the distribution network, with the exception of sampling at the consumers' tap, shall be in accordance with ISO 5667-5. For microbiological parameters, samples in the distribution network shall be taken and handled in accordance with EN ISO 19458, sampling purpose A.