

No. 461/ 2000

Decree of the Ministry of Social Affairs and Health

**relating to the quality and monitoring of
water intended for human consumption**

Issued in Helsinki on 19 May 2000

According to a decision of the Ministry of Social Affairs and Health, the following is enacted by virtue of Section 21 of the Health Protection Act (763/1994) of 19 August 1994:

Objective of the Decree

Section 1

By means of this Decree the Ministry of Social Affairs and Health issues general provisions as to the quality requirements for and necessary monitoring of water intended for human consumption.

Scope of application

Section 2

This Decree concerns all water within the meaning of Section 16 of the Health Protection Act

- which is supplied to be used for human consumption amounting to at least 10 m³ a day or for the use of at least 50 people;
- which is used in a food-production undertaking for the manufacture, processing, preservation or marketing of products or substances intended for human consumption, except for such cases in which the municipal health protection authority has ascertained that the quality of the water does not impair the wholesomeness of the foodstuff in its finished form; and
- such water which is supplied to be used for human consumption as part of a public or commercial activity.

Definitions

Section 3

For the purposes of this Decree:

'water consumer' shall mean persons, premises or establishments for which water is supplied to be used for human consumption;

Council Directive 98/83/EC, OJ L 330, 5.12.1998, p. 32

- 'water-using apparatus' shall mean dishwashers, boilers and other similar apparatus in which water intended for human consumption is used; and

- 'a property's own installations' shall mean the pipework including appliances of premises connected to the pipe of the supplier of water intended for human consumption, up to the connecting point.

Quality requirements

Section 4

Water intended for human consumption must not contain micro-organisms or parasites or any substances in such numbers or concentrations which may constitute a hazard to human health. Water intended for human consumption shall comply with the minimum requirements set out in Annex I, Tables 1 and 2, as well as in Annex I A, Table 1. Water intended for human consumption shall be also in other respects fit for its purpose, and it must not cause detrimental corrosion of or detrimental precipitation in water pipes and water-using apparatus. Quality recommendations based on feasibility are set out in Annex I, Table 3, and in Annex I A, Table 2.

Point of compliance

Section 5

The quality requirements apply to the water supplied from a distribution network by a supplier of water intended for human consumption at the point at which the water is taken from the consumer's tap, to the water supplied in a tank at the point at which the water is taken from the tank, and to the water offered for sale in bottles or supplied in a container at the point at which the water is bottled or put into containers. The water used in a food-production undertaking shall meet the quality requirements at the point where the water is used.

The supplier of water intended for human consumption is responsible for the compliance with the quality requirements up to the connecting point to the premises' pipework.

Derogations

Section 6

The Provincial State Office shall limit the duration of a derogation within the meaning of Section 17 of the Health Protection Act to as short a time as possible, not more than three years. A derogation can only be granted from complying with the chemical parametric values set out in Annex I, Table 2, to the Decree. The non-complying concentration may be one and a half times the parametric value, at the most. The Provincial State Office may, however, accept a higher concentration in case there is a special justified reason for that.

The supplier of water intended for human consumption shall include in its request for a derogation the following information:

- reason for the derogation;
- the parameter from whose parametric value the derogation is requested;
- previous monitoring results;
- the maximum concentration for which approval is requested;
- the area for which the supplier distributes water;
- the average and maximum quantity of distributed water;
- the number of consumers of the water;

- such food-production undertakings within the water supply for which the quality of water is of essential significance;
- a plan for remedial action, including a timetable and an estimate of the costs, and the requested duration of the derogation.

The municipal health protection authority shall give the Provincial State Office a statement on the request for derogation, which includes the opinion of the authority on the duration of the requested derogation as well as a report on any orders given by virtue of Section 20 of the Health Protection Act. Where bringing the quality of the water into compliance with this Decree requires alterations in the supply of water, a statement of the relevant Regional Environmental Centre shall be obtained on the alternative means of water supply.

The Provincial State Office shall send the derogations it has granted to the Ministry of Social Affairs and Health and to the Regional Environmental Centre for information.

If a supplier of water intended for human consumption, to which a derogation has been granted, distributes water amounting to at least 1 000 m³ per day or at least to 5 000 consumers, the Ministry of Social Affairs and Health shall inform of the derogation to the European Commission within two months of granting the derogation.

For a special reason, the Provincial State Office may grant a derogation for a second period of up to three years. The Ministry of Social Affairs and Health sends the European Commission a report of the situation for which the derogation is needed stating the reasons for the decision to grant the derogation. The Ministry of Social Affairs and Health may present to the Commission a request for a third derogation for a period of up to three years.

Regular monitoring of the quality of water intended for human consumption

Section 7

The municipal health protection authority shall carry out regular monitoring of the water intended for human consumption within the meaning of Section 2 of this Decree. The minimum numbers of samples for monitoring are set out in Annex II.

The regular monitoring includes

- check monitoring*, the purpose of which is to obtain on a regular basis information of the organoleptic and microbiological quality of water intended for human consumption as well as of the effectiveness of water treatment, particularly of disinfection, and of the compliance with the requirements, and

- audit monitoring*, through which the purpose is to find out whether the water intended for human consumption complies with the requirements in accordance with Annex I to this Decree.

Monitoring programme

Section 8

The municipal health protection authority shall in co-operation with the supplier of water intended for human consumption establish individual monitoring programmes for the regular monitoring of supplies of water intended for human consumption. The special characteristics of the supply shall be taken into consideration in the monitoring programme. The programme shall also include any needs for special monitoring that may arise from the local conditions, such as a vulnerable location of the water intake or accident-prone

activities nearby it. This means including in the monitoring also other parameters than those set out in Annex I, Tables 1, 2 and 3, and in Annex I A, Tables 1 and 2, or increasing the monitoring frequency of parameters which are significant from the point of view of safeguarding health conditions.

When drawing up the monitoring programme the municipal health protection authority shall, where necessary, request for the opinion of the relevant Regional Environmental Centre. The monitoring programmes of suppliers distributing water for human consumption amounting to at least 10 m³ a day or for the use of at least 50 people shall be sent to the Provincial State Office and the relevant Environmental Centre for information.

The monitoring programme shall be revised at least at five years' intervals and even at other times when that shall be deemed necessary due to changed conditions.

Content of the monitoring programme

Section 9

The monitoring programme shall include at least the analyses in accordance with Annex II, and the number of samples analysed shall not be less than what has been laid down therein.

Where the values of the results obtained from samples taken during the preceding two years are constant and significantly better than the parametric values set out in Annex I, and where there is no factor likely to deteriorate the quality of the water, the number of samples set out in Annex II, Table 2 may be reduced at the most to a half of the numbers given in the Table. In that case a corresponding alteration must be made to the monitoring programme.

Operational control of the supply and in-house control

Section 10

Information on the own operational control of the supplier of water intended for human consumption, as well as on the monitoring of the quality of water in connection with the in-house control of a food-production undertaking shall be collected in the monitoring programme. The operational control of the supply shall include sufficient monitoring of the quality of raw water for ensuring the appropriateness of the treatment of the water.

The quality requirements for and the monitoring of surface water intended for the abstraction of drinking-water are regulated separately.

Special situations

Section 11

In a suspected or detected water pollution situation, where necessary, also other parameters than those included in the monitoring programme shall be analysed and analyses shall be carried out more frequently than laid down in the monitoring programme.

Methods of analysis

Section 12

The methods of analysis to be used for monitoring shall comply with SFS-EN standards or, in default of such, with ISO standards, or they shall be such as correspond at least to these methods as far as the degree of accuracy and reliability is concerned. If other than these standard methods are used, they must be reported in connection with reporting the results.

Laboratories for analysis

Section 13

The laboratory which carries out monitoring analyses of water intended for human consumption within the meaning of this Decree shall meet the requirements in accordance with Section 49 of the Health Protection Act.

Obligations of the municipal health protection authority

Section 14

The municipal health protection authority shall, immediately after having received the results of a monitoring analysis, check whether the water intended for human consumption complies with the requirements laid down in this Decree and, where necessary, undertake measures according to the Health Protection Act.

Health-related quality standards

In case the water intended for human consumption does not comply with the microbiological standards set out in Annexes I and I A, Table 1, even after checking with a repeated analysis, or if other micro-organisms or parasites occur in the water in amounts hazardous to health the municipal health protection authority shall, together with the water supplier, investigate the cause of it and, by virtue of Section 20 of the Health Protection Act, order the water supplier to take prompt action to remedy the situation. The water consumers shall, without delay, be given necessary orders and instructions to prevent health hazards.

In case the water intended for human consumption, even after checking with a repeated analysis, does not comply with the chemical standards set out in Annex I, Table 2, or if other substances hazardous to health have been detected to occur in the water, the municipal health protection authority shall, together with the water supplier, investigate the cause of it and decide whether immediate action is needed to remedy the quality of water so as to meet the quality standards. If the exceeding of a parametric value poses a danger to the consumers of the water the municipal health protection authority shall, by virtue of Section 20 of the Health Protection Act, order the water supplier to take prompt action to remedy the situation. The water consumers shall be given necessary orders and instructions to prevent health hazards.

In case the exceeding of the parametric value is slight and no acute health hazards are to be expected, the municipal health protection authority shall order the water supplier to request the Provincial State Office for a derogation from compliance with the quality standards in accordance with Section 17 of the Health Protection Act and Section 6 of this Decree, for the duration of the remedial action. If non-compliance with the parametric value is trivial and the situation can be improved within 30 days from finding out the failure, the Provincial State Office need not be asked for a derogation.

In case the failure to meet the quality standard stems from the premises' own installations, and the quality of supplied water cannot be deemed to be the cause of this, the municipal

health protection authority shall ensure that the property owner takes necessary action to eliminate the health hazard and that the consumers of the water are given necessary instructions to avoid hazards.

Quality recommendations

In case the water intended for human consumption does not comply with the quality recommendations set out in Annex I, Table 3, or in Annex I A, Table 2, the municipal health protection authority shall investigate whether the exceeding of the parametric value poses any risk to health. If health risks can be associated with the failure, an order for remedial action shall be given. The consumers of the water shall be informed of the exceeding of the parametric values and their significance regardless of whether they pose health risks or not.

Notifications to other authorities

If the quality standards are not met owing to a suspected or detected pollution of the raw water of the supply for water intended for human consumption, the municipal health protection authority shall notify the Regional Environmental Centre thereof with a view to taking measures at the raw water intake.

The municipal health protection authority shall immediately notify the Provincial State Office of any monitoring results that do not comply with the quality standards. In case no derogation is requested the decision of the Municipal Health Authority shall also be communicated to the Provincial State Office.

Quality assurance of treatment, equipment and materials

Section 15

The municipal health protection authority shall ensure that the water treatment used for preparation of water intended for human consumption is appropriate and effective enough with respect to the quality of raw water.

Substances used in the treatment or distribution of water intended for human consumption or materials for new installations may not release impurities into water intended for human consumption in quantities higher than is necessary to make their use possible. Neither may they compromise the compliance with the quality requirements set in this Decree for the water intended for human consumption.

Substances used in the treatment of water intended for human consumption shall comply with SFS-CEN standards, as a minimum. In default of a confirmed standard for a substance, it shall comply with requirements corresponding to those regarding substances for which a standard has been confirmed.

Information and reporting

Section 16

The municipal health protection authority shall see to it that the supplier of water intended for human consumption gives sufficient information of the quality of water supplied by it. If the supplier of water has been granted a derogation within the meaning of Section 17 of the Health Protection Act and Section 6 of this Decree, the consumers of the water shall be informed of this matter as well as of the reasons for and content of the derogation and of planned remedial action.

The municipal health protection authority shall see to it that those households within the territory of the municipality that are not connected to a water pipe from a supply of water

intended for human consumption receive sufficient information of the quality of water in the area, of possible health hazards associated with it, as well as of possibilities to eliminate the hazards.

The municipal health protection authority shall send the monitoring results of water suppliers distributing at least 1 000 m³ water per day or serving at least 5 000 consumers to the Provincial State Office within three months from the end of each calendar year. The Provincial State Office shall draw up a summary of the results and send it to the National Public Health Institute, which shall draw up at three years' intervals a national report to be sent to the European Commission.

Entry into force

Section 17

This Decree enters into force on 26 May 2000. The Decision of the Ministry of Social Affairs and Health relating to the quality and monitoring of water intended for human consumption (74/1994) of 21 January 1994 is hereby repealed.

Transitional provision

Section 18

The quality of water intended for human consumption and the monitoring thereof shall be brought in compliance with this Decree by 25 December 2003.

Helsinki, 19 May 2000

Minister of Health and Social Services *Osmo Soininvaara*

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QUALITY STANDARDS AND RECOMMENDATIONS FOR WATER INTENDED FOR HUMAN CONSUMPTION

Table 1. Microbiological standards (maximum density)

<i>Escherichia coli</i>	0 cfu/100 ml
Enterococci	0 cfu/100 ml

Table 2. Chemical standards (maximum concentration)

		Note
Acrylamide	0,10 µg/l	(1)
Antimony	5,0 "	
Arsenic	10 "	
Benzene	1,0 "	
Bentso(a)pyrene	0,010 "	
Boron	1,0 mg/l	
Bromate	10 µg/l	(2)
Cadmium	5,0 "	
Chromium		50 "
Copper	2,0 mg/l	(3)
Cyanide	50 µg/l	
1,2-dichloroethane	3,0 "	
Epichlorohydrin	0,10 "	(1)
Fluoride	1,5 mg/l	
Lead	10 µg/l	(3)
Mercury	1,0 "	
Nickel	20 "	(3)
Nitrate (NO ₃ ⁻)	50 mg/l	(4)
Nitrate nitrogen (NO ₃ ⁻ -N)	11,0 "	
Nitrite (NO ₂ ⁻)	0,5 "	(4)
Nitrite nitrogen (NO ₂ ⁻ -N)	0,15 "	
Pesticides	0,10 µg/l	(5 and 6)
- " - total	0,50 "	(5)
Polycyclic aromatic hydrocarbons	0,10 "	(7)
Selen	10 "	
Tetrachloroethene and Trichloroethene, sum	10 "	
Trihalomethanes, total	100 "	(2 and 8)
Vinyl chloride	0,50 "	(1)

Chlorophenols, total 10 ” (9)

Notes

- 1) the concentration is calculated from the maximum amount released from the used polymer according to the product specification; the parametric value applied to the substance found in the water is the detection limit
- 2) without compromising disinfection, where possible, a lower value shall be striven for
- 3) the sample is taken from the consumer's tap in such a way that the concentration corresponds to a weekly average
- 4) the parametric value for nitrite in the water leaving the water supply is 0,10 mg/l; the concentration of nitrate/50 + the concentration of nitrite/3 must not exceed the value of 1
- 5) the compounds meant are organic insecticides, herbicides, fungicides, nematocides, acaricides, algicides, rodenticides, slimicides and related products as well as their metabolites, degradation and reaction products
- 6) the parametric value for aldrin, dieldrin, heptachlor and heptachlor epoxide is 0,030 µg/l
- 7) the compounds meant are benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(ghi)perylene, indeno-(1,2,3-cd)-pyrene
- 8) the compounds meant are chloroform, bromoform, dibromochloromethane, bromodichloromethane
- 9)) the compounds meant are tri-, tetra- and pentachlorophenol

Table 3. Quality recommendations (maximum target values for indicator parameters)

		<i>Maximum concentration</i>	<i>Note</i>
Aluminium		200 µg/l	
Ammonium (NH ₄ ⁺)		0,50 mg/l	
- " - (NH ₄ -N)		0,4 "	
Chloride		250 "	(1,2)
Manganese		50 µg/l	
Iron		200 "	
Sulphate	250 mg/l		(1,3)
Sodium		200 "	
Oxidisability (COD _{Mn} -O ₂)		5,0 "	(4)
<i>Guide level</i>			
<i>Clostridium perfringens</i> (including spores)		0 cfu/100 ml	(5)
Coliform bacteria		0 cfu/100 ml	
Colony count (22 °C)	no abnormal change		
pH		6,5 - 9,5	(1)
Conductivity		less than 2 500 µS/cm	(1)
Turbidity		acceptable to consumers	(6)
		and no abnormal change	
Colour		- " -	
Odour and taste		- " -	
Total organic carbon (TOC)		no abnormal change	(7)
RADIOACTIVITY			(8)
Tritium	100 Bq/l		
Total indicative dose	0,10 mSv/year		

Notes

- 1) the water must not be corrosive
- 2) to prevent the corrosion of plumbing materials, the concentration of chloride should be less than **25 mg/l**
- 3) to prevent the corrosion of plumbing materials, the concentration of sulphate should be less than **150 mg/l**
- 4) need not necessarily be measured if TOC is analysed
- 5) to be analysed if the raw water is surface water
- 6) a value of less than 1 NTU should be striven for in the turbidity of the water leaving a surface water supply
- 7) need not be measured if oxidisability is analysed and the volume of water distributed is less than 10,000 m³/d

8) tritium and the total indicative dose of radioactivity need not be measured if it is known on the basis of earlier monitoring (Finnish Radiation and Nuclear Safety Authority) that the values of these are clearly below the parametric value; separate provisions will be issued on monitoring and monitoring frequency thereof; radon and radon decay products, tritium and potassium-40 are excluded from the calculation of total indicative dose.

QUALITY STANDARDS AND RECOMMENDATIONS FOR WATER INTENDED FOR HUMAN CONSUMPTION OFFERED FOR SALE IN BOTTLES OR CONTAINERS

Parametric values differing from values set out for other water intended for human consumption

Table 1. Microbiological standards (maximum density)

<i>Escherichia coli</i>	0 cfu/250 ml
Enterococci	0 cfu/250 ml
<i>Pseudomonas aeruginosa</i>	0 cfu/250 ml
Colony count 22 °C	100 cfu/ml
- ” - 37 °C	20 cfu/ml

Table 2. Quality recommendations

Coliform bacteria	0 cfu/250 ml
pH	4,5 - 9,5

MONITORING ANALYSES OF WATER INTENDED FOR HUMAN CONSUMPTION

Table 1. *Check monitoring:* at least the following parameters

Odour	
Taste	
Turbidity	
Colour	
pH	
Conductivity	
Iron	
Manganese	
Nitrite	if chloramine is used as a disinfectant
Aluminium	if aluminium compounds are used in water treatment or the raw water contains plenty of aluminium
Ammonium	
<i>Clostridium perfringens</i> (including spores)	if the raw water is surface water <i>Escherichia coli</i>
Coliform bacteria	
Colony count 22 °C and 37 °C	in the case of water offered for sale in bottles or containers
<i>Pseudomonas aeruginosa</i>	- ” -
Additional analyses included in the monitoring programme	

Audit monitoring includes analysis of all parameters listed in Annex I, Tables 1, 2 and 3, and of parameters in Annex I A, Tables 1 and 2, as well as additional analyses included in the monitoring programme. For the monitoring of radioactivity a separate regulation will be issued.

The following analyses can be left out if:

Acrylamide	polyacrylic amides are not used in water treatment
Epichlorohydrin	epoxy resins are not used in water treatment or equipment materials
Vinyl chloride	tri- or tetrachloroethenes have not been found in the water and vinyl chloride is not dissolved from PVC used in materials
Bromate	if the water is not disinfected surface water or ozone treated groundwater
Trihalomethanes	if the water is not disinfected with chlorine chemicals
Pesticides	if pesticides are not used in the catchment area of the raw water

The following parameters are analysed at least once, and if the concentrations are less than 50 % of the parametric value and there is no obvious reason for them to rise they will later be analysed at five years' intervals:

Antimony, benzene, benzo(a)pyren, boron, bromate from surface water which is not ozonated, cyanide, selenium, 1,2 -dichloroethane, tetrachloroethene, trichloroethene, polycyclic aromatic hydrocarbons, chlorophenols.

Table 2. Minimum frequency of analyses of water intended for human consumption subject to regular monitoring

Volume of water distributed or produced each day within a supply zone (m ³) ^{1,2)}	Minimum number of samples per year ³⁾	
	Check monitoring	Audit monitoring
10 - 50	1	1 at 2 years' intervals
50 - <100	4	1
100 - <1 000	6	1
1 000 - < 10 000	6 - 32	1 - 4
10 000 - < 20 000	32 - 64	4
20 000 - <30 000	64 - 94	4 - 6
30 000 - <60 000	94 - 184	6 - 9
60 000 - 100 000	184 - 304	9 - 12
over 100 000	304 + 3 additional samples/ delivered 1 000 m ³ /d	12 +1 additional sample/ delivered 25 000 m ³ /d

Notes

¹⁾the number of consumers may be used instead of the daily volume of water, in which case 200 l is used as the daily volume of water for one person

²⁾in a food-production undertaking the minimum number of samples for check monitoring is 4 per year and for audit monitoring 1 per year, unless the number of samples has been reduced by virtue of Section 9 of this Decree

³⁾at equal intervals from different parts of the distribution network so that the correct picture of the quality of water is obtained in the whole distribution zone

METHODS OF ANALYSIS

1. Microbiological parameters

Coliform bacteria and <i>Escherichia coli</i>	ISO 9308-1
Enterococci	ISO 7899-2
<i>Pseudomonas aeruginosa</i>	prEN ISO 12780
Colony count 22 °C and 37 °C	EN-SFS ISO 6222
<i>Clostridium perfringens</i> (including spores)	
Membrane filtration followed by anaerobic incubation of the membrane on m-CP-agar (Note 1) at 44 ± 1°C for 21±3hours. Count opaque yellow colonies that turn pink or red after exposure to ammonium hydroxide vapours for 20-30 seconds.	

2. Chemical parameters

The method of analysis used must be capable of measuring concentrations for parameters with a trueness¹⁾, precision²⁾ and limit of detection³⁾ (concepts specified in ISO standard 5725) at least in accordance with the requirements set out in the Table below. Whatever the sensitivity of the method of analysis used, the result must be expressed using at least the same number of decimals as for the parametric value considered in Annex I, Tables 1 and 2.

- 1) Trueness describes the nearness of the approved reference value and a large mass of measurement results, and it is usually expressed as the systematic error.
- 2) Precision expresses the nearness of random measurement results. The measure used is average dispersion or standard deviation.
- 3) Limit of detection means the lowest concentration by which it can be shown whether the sample contains the substance to be analysed or not.

Parameter	Trueness		Precision		Limit of detection % of parametric value
	% of parametric value		% of parametric value		
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
Chromium	10		10		10
Copper	10		10		10
Cyanide 10		10		10	
1,2-dichloroethane	25		25		10
Fluoride 10		10		10	
Lead	10		10		10
Mercury 20		10		10	
Nickel	10		10		10
Nitrate (NO ₃ ⁻)	10		10		10
Nitrite (NO ₂ ⁻)	10		10		10
Pesticides	25		25		25
Polycyclic aromatic hydrocarbons	25		25		25

Selenium	10		10		10
Tetrachloroethene	25		25		10
Trichloroethene	25		25		10
Trihalomethanes	25		25		10
Aluminium	10		10		10
Ammonium (NH ₄ ⁺)	10		10		10
Chloride	10	10		10	
Manganese	10		10		10
Iron	10		10		10
Sulphate	10	10		10	
Sodium	10		10		10
Oxidisability	25		25		10
pH	0,2 pH units	0,2 pH units			

3. Parameters for which no method of analysis is specified

Turbidity Trueness, precision and limit of detection 25 %

Colour

Odour

Taste

Total organic carbon (TOC)

Notes

1) The composition of m-CP-agar:

Basal medium:

Tryptose	30 g
Yeast extract	20 g
Sucrose	5 g
L-cysteine hydrochloride	1 g
MgSO ₄ · 7H ₂ O	0,1 g
Bromocresol purple	40 mg
Agar	15 g
Water	1000 ml

Dissolve the ingredients of the basal medium, adjust pH to 7,6 and autoclave at 121 °C for 15 minutes. Allow the medium cool and add:

D-cycloserine	400 mg
Polymyxine-B sulphate	25 mg
Indoxyl-β-D-glucoside	60 mg
to be dissolved in 8 ml sterile distilled water before addition	
Filter-sterilised 0,5 % phenolphthalein diphosphate solution	20 ml
Filter-sterilised 4,5 % FeCl ₃ ·6H ₂ O diphosphate solution	2 ml