

LEGAL NOTICE No 68/2003
POTABLE WATER REGULATIONS IN FISHERY PRODUCT
ACTIVITIES

PART I
PRELIMINARY

Art. 1 Short Title

These Regulations may be cited as "Potable Water Regulations in fishery product activities – Legal Notice No 68/2003"

Art. 2 Scope of Application

These Regulations concern standards of potable water to be observed in fishery product activities within the context of the Fishery Product Proclamation No. 105/1998 and the Fishery Product Regulation Legal Notice No. 40/1998.

The objectives of these Regulations shall be:

- a) to protect human health from the adverse effects of any contamination of potable water intended for fishery product activities by ensuring that it is wholesome and clean; and
- b) to include water used in the fishery product industry unless it can be established that the use of such water does not affect the wholesomeness of the finished product.

Art. 3 Definitions for the purpose of these Regulations

- (1) 'potable water' means
 - (a) all water either in its original state or after treatment, intended for drinking, cooking, food preparation or other domestic purposes, regardless of its origin and whether it is supplied from a distribution network, from a tanker, or in bottles or containers; and
 - (b) all water used in any food-production for the manufacture, processing, preservation or marketing of products or substances intended for human consumption unless the competent national authorities are satisfied that the quality of the water doesn't affect the wholesomeness of the foodstuff in their finished form.
- (2) 'domestic distribution system' means the pipe work, fittings and appliances which are installed between the taps, that are normally used for fishery product activities, and the distribution network but only if it is not the responsibility of the water supplier, in its capacity as a water supplier, according to the relevant laws of the State of Eritrea.

Art. 4 Types of water to which these Regulations do not apply

These Regulations shall not apply to:

- (a) natural mineral waters recognised or defined as such by the Eritrean Standards Institution; and
- (b) medicinal water recognised as such by the Eritrean Standards Institution.

PART II
STANDARDS AND POINTS OF COMPLIANCE

Art. 5 Quality Standards

- (1) The Competent Authority shall take the measures necessary to ensure that the potable water intended for fishery product activities is wholesome and clean. For the purposes of the minimum requirements of these Regulations, potable water intended for fishery product activities shall be wholesome and clean if it:
 - (a) is free from any micro-organisms and parasites and from any substances which, in numbers or concentrations, constitute a potential danger to human health; and
 - (b) meets the minimum requirements set out in Annex 1, Parts A and B hereof.
- (2) With regard to the parameters set out in Annex 1, Part C hereof, the values need to be fixed only for monitoring purposes and to fulfill the obligations imposed in case of remedial actions as laid down in Article 15 hereof.
- (3) The Competent Authority shall set values for additional parameters not included in Annex 1 hereof, where it is suspected that the water may cause the contamination of fishery products. The values set should provide a minimum guarantee that the water is free from micro-organisms, parasites and substances which in numbers or concentrations constitute a potential danger to human health.
- (4) The Competent Authority shall take all the necessary measures to ensure that substances or materials for new installations do not contain impurities in concentrations higher than is necessary for their use and do not, either directly or indirectly, reduce the protection of human health provided for in these Regulations.

Art. 6 Points of compliance

The parametric values set in accordance with Article 5 hereof shall be complied with:

- (a) in the case of water supplied from a distribution network, at the point, within premises or an establishment, from which it emerges;
- (b) in the case of water supplied from a tanker, at the point at which it emerges from the tanker.

PART III
GENERAL REQUIREMENTS FOR FISHERY PRODUCT ACTIVITIES

Art. 7 General obligations

- (1) Facilities should have a continuous supply of potable water within the meaning of these Regulations, or alternatively of clean sea water or sea water treated by an appropriate system (filtration and chlorination, UV sterilisation) under pressure and in sufficient quantity.
- (2) If the water used in the establishment receives additional treatment prior to use, this shall be done in accordance with the instructions of the manufacturer of any equipment or chemicals utilised, and under the supervision of the management of the establishment.

- (3) Exceptionally however, a supply of non-potable water is permitted for the production of steam, fire-fighting and as a cooling water, provided that the pipes installed for the purpose preclude the use of such water for other purposes and present no risk of contamination of the products. Non-potable water pipes shall be clearly distinguished from those used for potable water or clean seawater.
- (4) The management of the establishment shall use only potable water for:
 - (a) fish or fish-contact surfaces;
 - (b) the manufacture of ice; and
 - (c) cleaning and disinfecting purposes.

Art. 8 Water supply and distribution inside an establishment

- (1) All pipework of the water distribution system shall be impermeable, well constructed and in a good state of repair. Iron pipes should be painted externally in order to protect them from corrosion.
- (2) Water supplied to the sanitary facilities shall be isolated from the rest of the establishment and should be supplied from a separate circuit.
- (3) There shall be provision to prevent back-flow or cross contamination between potable and non-potable water within the establishment.
- (4) The management of an establishment shall:
 - (a) describe whether the source of the water supplied is:
 - (i) municipal water (mains) with/without intermediary storage; or
 - (ii) surface water, well water or bore-hole water with/without intermediary storage; or
 - (iii) desalinated sea water with/without intermediary storage or a combination of different sources;
 - (b) be responsible for ensuring that water used in the establishment is potable and fit for fishery product activities;
 - (c) be able to demonstrate the water distribution system within the establishment; and
 - (d) provide a water distribution/reticulation map whereon the pipes and outlets could be identified by consecutive numbers that enable their location on the establishment map and in the establishment.

Art. 9 Intermediary storage of water

- (1) The establishment shall possess adequate water storage tanks or cisterns with sufficient capacity to meet the needs when operating at maximum capacity and also to allow sufficient water-chlorine contact time in case of chlorination.
- (2) The tanks or cisterns shall be well constructed with their internal surfaces smooth and impermeable to allow for easy cleaning and disinfection.
- (3) The water tank or cistern shall be provided with an inspection hatch that permits entry for cleaning purposes. The design of the hatch should prevent entry of rainwater, ground water and any process water that may flow out of the establishment.
- (4) The water tank or cistern should not allow entry of insects, rodents, other animals and dust.

- (5) The area surrounding each water tank or cistern should be kept clean and free from accumulation of rubbish, dust, water and other materials that could contaminate the water.
- (6) The water tank or cistern shall have a sufficiently sloped floor and drainage to facilitate proper cleaning.
- (7) Water tanks shall be inspected at regular intervals to keep them in a good condition. A cleaning and disinfection plan has to be installed.

Art. 10 Water circulation and re-circulation

- (1) Water that is re-circulated and reused within a facility shall be treated in such a way that no health hazard can result from its reuse and shall be potable and fit for fishery product activities.
- (2) Water re-circulation and circulation systems shall be clearly identified and have:
 - (a) no cross connection between potable and non-potable water;
 - (b) non-return devices installed to prevent back flow into the systems;
 - (c) no dead ends; and
 - (d) non-potable water outlets clearly identified.
- (3) Water can only be used and reused or re-circulated for cooling of a canned product if it is:
 - (a) potable;
 - (c) chlorinated to a level of not less than 0.5 ppm free residual chlorine at the end of the cooling cycle;
 - (c) filtered before re-use; and
 - (d) all storage tanks, cooling towers, pipelines or the like used for handling the water are constructed to facilitate inspection and cleaning.

Art. 11 Hot water and steam

- (1) The establishment shall possess a means for heating water to a temperature of at least 80° C, in quantities adequate for hand washing and, if used, for washing of equipment, machinery and the premises in general.
- (2) The installation of either a steam system or pressurised hot water for cleaning purposes is recommended.
- (3) Where steam or pressurised hot water is used, it shall be supplied in sufficient volume and pressure and contain no hazardous substances.

Art. 12 Chlorination system

- (1) The chlorination system shall comply with the following:
 - a) chlorine should be added on-line by dosing or injection (gas or liquid) prior to intermediary storage to permit sufficient contact time with the water;
 - b) the retention tank shall have the capacity to retain water and the chlorine added for at least 20 - 30 minutes;
 - c) the chlorine not combined after 20 - 30 minutes remain as free residual chlorine available on line to react with whatever contaminants present in the piping system (back syphonages, dead ends, for example).
 - d) the cleaning program for the intermediary storage tanks shall be documented, monitored and demonstrated; and

- e) the management of an establishment shall put in place measures to ensure the proper functioning of the chlorination system, and the free residual chlorine shall be checked at intervals of not less than 8 hours or at the beginning of each shift but at least once a day.
- (2) An alarm system shall be recommended to ensure the proper functioning of the chlorination system.
- (3) The products (fish, shrimp, molluscs, ...) shall not be washed, dipped, glazed, or treated with hyper-chlorinated water. It is recommended to use, in the case of an in-plant chlorination system, a residual chlorine level as for water intended for human consumption.

Art. 13 Quality Management

- (1) The management should install procedures and instructions to implement the chlorination system, to schedule the free residual chlorine checks, the microbiological checks and the physico-chemical checks and to determine the share of own, private or official laboratories in the analyses. That is:
 - (a) planned actions shall be scheduled in a timetable to demonstrate the commitment for future actions; and
 - (b) these schedules and timetables shall be approved by the Competent Authority and its execution should be checked on a regular basis.
- (2) Responsibilities and authorities should be established for the implementation, maintaining, monitoring and verification of the potable water control plan.
- (3) Procedures shall be installed to control and safeguard the safety and quality of water by:
 - (a) analysing the residual chlorine content;
 - (b) microbiological analysis; and
 - (c) physico-chemical tests.
- (4) A fail-safe control system has to be worked out to control the safety and quality of water. The results shall be compared with the standards. Verification has to be done to ensure that the corrective actions were successful.
- (5) The complete procedure for the control and treatment of the water used shall be documented by the quality management including treatment and analysis results.
Analysis records shall be kept to show the efficiency of the treatment or that the microbiological quality was adequate.
- (6) On the spot training and special training programs shall be installed to ensure that:
 - (a) staff are continually up-dated of the risks and their responsibilities especially concerning the assurance of water quality and safety; and
 - (b) records of courses, training sessions and attendance should be kept for inspection and evaluation.

PART IV
MONITORING AND REMEDIAL ACTIONS

Art. 14 Monitoring

- (1) The Competent Authority should take all the necessary measures to ensure that regular monitoring of water quality is carried out in order to check whether the water available meets the requirements of these Regulations and in particular the chemical parametric values set in accordance with Article 5 hereof.
Samples should be taken so that they are representative of the quality of the water used throughout the year.
In addition to these, where disinfection and the use of certain substances or materials forms part of the preparation or distribution of the water, the Competent Authority shall take all the necessary measures that:
 - a) the efficiency of the disinfection applied is ensured;
 - b) the use of the substances is governed; and
 - c) any contamination from by-products of disinfection is kept to a minimum without compromising the disinfection in order to avoid harmful effects to human health.
- (2) In-order to meet the obligations imposed in sub-article 1 hereof, appropriate monitoring programmes shall be installed. These monitoring programmes shall meet the minimum requirements set out in Annex II hereof.
- (3) Without prejudice to the requirements for the frequency of sampling set out in Table B of Annex II hereof:
 - (a) the frequency of water sampled for the purpose of check monitoring in an establishment:
 - (i) in the case of water supplied from a public distribution network without intermediary storage, shall be at least once per three months from various representative outlets within the plant as laid down in Annex IV hereof.
 - (ii) In the case of water supplied from a public distribution network with intermediary storage or from a town water source, shall be at least once per month from various representative outlets within the plant as laid down in Annex IV hereof.
 - (b) the frequency of water sampled for the purpose of audit monitoring in an establishment shall be at least once per year; and
 - (c) the frequency of the routine water sampling, in connection with the auto-control system or own checks established under the quality assurance programme installed in the establishments, shall be left to the decision of the quality management team in consultation with the Competent Authority.
- (4) The sampling points shall be determined by the Competent Authority and shall meet the relevant requirements set out in Annex II hereof.
- (5) (a) The Competent Authority shall comply with the specifications for the analyses of parameters set out in Annex III hereof.
 - (b) Methods other than those specified in Annex III of Part 1 hereof may be used provided that the results obtained are at least as

reliable as those obtained by the methods specified. The Competent Authority that has recourse to alternative methods shall provide all the relevant information concerning such methods and their equivalence.

- (c) For those parameters listed in Annex III of Parts 2 and 3 hereof, any method of analysis may be used provided that it meets the requirements set out therein.
- (6) If there is a reason to suspect that they may be present in amounts or numbers which constitute a potential danger to human health, the Competent Authority shall ensure that additional monitoring is carried out on a case-by-case basis of substances and micro-organisms for which no parametric value has been set in accordance with Article 5 hereof.

Art. 15 Remedial actions and restrictions in use

- (1) The Competent Authority shall ensure that any failure to meet the parametric values set in accordance with Article 5 hereof is immediately investigated in order to identify the cause.
- (2) If the measures taken to meet the obligations imposed does not meet the parametric values set in accordance with Article 5 hereof, the Competent Authority shall ensure that the necessary remedial actions are taken as soon as possible to restore its quality. The Competent Authority shall give priority to the enforcement of the remedial actions, having regard *inter alia* to the extent to which the relevant parametric values have been exceeded and thus the potential danger to human health.
- (3) Whether there is a failure to meet the parametric values or not, the Competent Authority shall ensure that any supply of water intended for fishery product activities that constitutes a potential danger to human health is prohibited or its use restricted or such other action is taken as is necessary to protect human health.
- (4) The Competent Authority shall decide what action under sub-article 3 hereof should be taken, bearing in mind the possible health risks either by an interruption of the supply or a restriction in its use for fishery product activities.
- (5) Other Ministries, such as the Ministry of Land, Water and Environment, may establish guidelines to assist the Competent Authority to fulfil its obligations stated under sub-article (4) hereof.
- (6) In the event of non-compliance with the parametric values or with the specifications set out in Annex I of Part C hereof, the Competent Authority shall consider whether that non-compliance poses any health risks and shall take remedial actions to restore the quality of the water.
- (7) Where remedial measures are taken, the Competent Authority shall ensure that the establishments are notified except when it considers that the non-compliance is trivial.

Art. 16 Information and reporting

The Competent Authority shall take all the necessary measures to ensure that adequate and up-to-date information on the quality of water is made available.

PART V

Art. 17 Repeal

The Potable Water Regulations, Legal Notice No. 42/1998, is hereby repealed.

Art. 18 Effective Date

These Regulations shall come into force on the date of their publication in the Gazette of Eritrean Laws.

Done at Asmara, this 30th day of April, 2003
Ahmed Haj Ali,
Minister of Fisheries.

ANNEX I

The standards in Annex I hereof are generally based on the World Health Organisation's 'Guidelines for drinking water quality', and the opinion of the "European Commission's Scientific Advisory Committee" to examine the toxicity and eco-toxicity of chemical compounds.

PARAMETERS AND PARAMETRIC VALUES

PART A

Microbiological Parameters

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

PART B

Chemical Parameters

Parameter	Parametric value	Unit	Notes
Acrylamide	0.10	µg/l	Note 1
Antimony	5.0	µg/l	
Arsenic	10.0	µg/l	
Benzene	1.0	µg/l	
Benzo(a)pyrene	0.010	µg/l	
Boron	1.0	Mg/l	
Bromate	10.0	µg/l	Note 2
Cadmium	5.0	µg/l	
Chromium	50	µg/l	
Copper	2.0	Mg/l	Note 3
Cyanide	50.0	µg/l	
1,2-dichloroethane	3.0	µg/l	
Epichlorohydrin	0.10	µg/l	Note 1
Fluoride	1.5	Mg/l	
Lead	10.0	µg/l	Note 3 and 4
Mercury	1.0	µg/l	
Nickel	20.0	µg/l	Note 3
Nitrate	50.0	Mg/l	Note 5
Nitrite	0.50	Mg/l	Note 5
Pesticides	0.10	µg/l	Note 6 and 7
Pesticides - Total	0.50	µg/l	Note 6 and 8
Polycyclic aromatic hydrocarbons	0.10	µg/l	Sum of concentrations of specified compounds; Note 9
Selenium	10.0	µg/l	Sum of concentrations of specified parameters
Tetrachloroethene and Trichloroethene	10.0	µg/l	Sum of concentrations of specified compounds; Note 10
Trihalomethanes - Total	100.0	µg/l	
Vinyl chloride	0.50	µg/l	Note 1

- Note 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.
- Note 2:* Where possible, without compromising disinfection, the Competent Authority should strive for a lower value.
- Note 3:* The value applies to a sample of water intended for fishery product activities obtained by an acceptable sampling method at the tap so as to be representative of a weekly average value. Where appropriate, the sampling and monitoring methods shall be applied in a harmonised fashion. The Competent Authority shall take into account the occurrence of peak levels that may cause adverse effects to human health.
- Note 4:* The Competent Authority shall ensure that all appropriate measures are taken to reduce the concentration of lead in water intended for fishery product activities during the period needed to achieve compliance with the parametric value. When implementing the measures to achieve compliance with that parametric value, the Competent Authority shall progressively give priority where lead concentrations in the water are the highest.
- Note 5:* The Competent Authority shall ensure that $[\text{nitrate}]/50 + [\text{nitrite}]/3 \leq 1$ (the square brackets signify the concentrations in mg/l for nitrate (NO₃) and nitrite (NO₂)) is met and that the value of 0.10 mg/l for nitrites is met in ex-water treatment works.
- Note 6:* 'Pesticides' means:
- organic insecticides
 - organic herbicides
 - organic fungicides
 - organic nematocides
 - organic acaricides
 - organic algicides
 - organic rodenticides
 - organic slimicides
 - related products (*inter alia*, growth regulators)
- and their relevant metabolites, degradation and reaction products.
- Only those pesticides that are likely to be present in a given water supply need to be monitored.
- Note 7:* The parametric value applies to each individual pesticide. In the case of aldrin, dieldrin, heptachlor and heptachlor epoxide the parametric value is 0.030 µg/l.
- Note 8:* 'Pesticides – Total' means the sum of particular pesticides detected and quantified in the monitoring procedure.
- Note 9:* The specified compounds are:
- benzo(b)fluoranthene,
 - benzo(k)fluoranthene
 - benzo(ghi)perylene
 - indeno(1,2,3-cd)pyrene
- Note 10:* Where possible, without compromising disinfection, the Competent Authority should strive for a lower value.

The specified compounds are:
chloroform, bromoform, dibromochloromethane, bromodichloromethane.

The Competent Authority shall ensure that appropriate measures are taken to reduce, as much as possible, the concentration of THMs (Trihalomethanes) in water intended for fishery product activities during the period needed to achieve compliance with the parametric value.

When implementing the measures to achieve this value, the Competent Authority shall progressively give priority to those areas where THM (Trihalomethane) compounds in water are the highest.

PART C
Indicator Parameters

Parameter	Parametric value	Unit	Notes
Aluminium	200	µg/l	
Ammonium	0.50	mg/l	
Chloride	250	mg/l	Note 1
<i>Clostridium perfringens</i> (including spores)	0	Number/100 ml	Note 2
Colour	Acceptable to consumers and no abnormal change		
Conductivity	2,500	µS cm ⁻¹ at 20° C	Note 1
Hydrogen ion concentration	6.5 ≤ [H ⁺] ≤ 9.5		Notes 1
Iron	200	µg/l	
Manganese	50	µg/l	
Odour	Acceptable to consumers and no abnormal change		
Oxidisability	5.0	mg/l O ₂	Note 3
Sulphate	250	mg/l	Note 1
Sodium	200	mg/l	
Taste	Acceptable to consumers and no abnormal change		
Colony count 22°	No abnormal change		
Coliform bacteria	0	number/100 ml	
Total organic carbon (TOC)	No abnormal change		Note 4
Turbidity	Acceptable to consumers and no abnormal change		Note 5

RADIOACTIVITY

Parameter	Parametric value	Unit	Notes
Tritium	100	Bq/l	Notes 6 and 8
Total indicative dose	0.10	mSv/year	Notes 7 and 8

Note 1: The water should not be hard.

- Note 2:* This parameter need not be measured unless the water originates from or is influenced by surface water. In the event of non-compliance with this parametric value, the Competent Authority shall investigate the supply to ensure that there is no potential danger to human health arising from the presence of pathogenic micro-organisms, e.g. cryptosporidium.
- Note 3:* This parameter need not be measured if the parameter TOC is analysed.
- Note 4:* This parameter need not be measured for supplies of less than 10 000 m³ a day.
- Note 5:* In the case of surface water treatment, the Competent Authority should strive for a parametric value not exceeding 1.0 NTU (nephelometric turbidity units) in the water ex-treatment works.
- Note 6:* Monitoring frequencies to be set later in Annex II hereof.
- Note 7:* Excluding tritium, potassium-40, radon and radon decay products; monitoring frequencies, monitoring methods and the most relevant locations for monitoring points to be set later in Annex II hereof.
- Note 8:* The Competent Authority is not required to monitor drinking water for tritium or radioactivity to establish total indicative dose where it is satisfied that, on the basis of other monitoring carried out, the levels of tritium of the calculated total indicative dose are well below the parametric value.

ANNEX II
MONITORING
TABLE A
Parameters to be analysed

1. Check monitoring

The purpose of check monitoring is to provide regular information on the organoleptic and microbiological quality of the water supplied for fishery product activities as well as to collect information on the effectiveness of water treatment (particularly of disinfection), where it is used, in order to determine whether or not the water used complies with the relevant parametric values laid down in these Regulations.

The following parameters shall be subject to check monitoring. (The Competent Authority may add other parameters to this list if it deems it appropriate.)

Aluminium (Note 1)
Ammonium
Clostridium perfringens (including spores) (Note 2)
Colour
Conductivity
Escherichia coli (*E. coli*)
Hydrogen ion concentration
Iron (Note 1)
Nitrite (Note 3)
Odour
Pseudomonas aeruginosa Taste
Colony count 22 °C and 37 °C
Coliform bacteria
Turbidity
Note 1: Necessary only when used as a component in flocculant (*).

- Note 2:* Necessary only if the water originates from or is influenced by surface water (*).
- Note 3:* Necessary only when chloramination is used as a disinfectant (*).

(*) In all cases, the parameters are in the list for audit monitoring.

2. Audit monitoring

The purpose of audit monitoring is to collect the necessary information in order to determine whether or not all the parametric values laid down in these Regulations are met. All parameters set in accordance with Article 5 (1) and (3) hereof shall be subject to audit monitoring unless it is established by the Competent Authority, for a period of time to be determined, that a parameter is not likely to be present in a given water supply in concentrations which could lead to the risk of a breach of the relevant parametric value. This paragraph does not apply to the parameters for radioactivity that are subject to Notes 6, 7 and 8 in Annex 1 of Part C hereof; they will be monitored in accordance with the monitoring requirements laid down later.

TABLE B

Minimum frequency of sampling and analysis for water supplied from a distribution network or from a tanker

The Competent Authority shall take samples at the points of compliance, as defined in Article 6 hereof, so that water intended for fishery product activities meets the requirements of these Regulations. However, in the case of a distribution network, the Competent Authority 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.

Volume of water distributed or produced each day within a supply zone in m³ (Notes 1 and 2)	Check monitoring number of samples per year. (Notes 3, 4 and 5)	Audit monitoring Number of samples per year. (Notes 3 and 5)
≤ 100	(Note 6)	(Note 6)
> 100 ≤ 1 000	4	1
> 1 000 ≤ 10 000	4 + 3 for each 1 000 m ³ /d and part thereof of the total volume	1 + 1 for each 3 300 m ³ /d and part thereof of the total volume
> 10 000 ≤ 100 000		3 + 1 for each 10 000 m ³ /d and part thereof of the total volume
> 100 000		10 + 1 for each 25 000 m ³ /d and part thereof of the total volume

- Note 1:* A supply zone is a geographically defined area within which water comes from one or more sources and within which water quality may be considered as being approximately uniform.
- Note 2:* The volumes are calculated as average used over a calendar year.
- Note 3:* In the event of intermittent short-term supply, the Competent Authority will decide the monitoring frequency of water distributed by tankers.
- Note 4:* For the different parameters in Annex I hereof, the Competent Authority may reduce the number of samples specified in the table if:
- (a) the results obtained from samples taken during a period of at least two successive years are constant and significantly better than the limits laid down in Annex I hereof, and
 - (b) no factor is likely to cause a deterioration of the quality of the water.
- The lowest frequency applied shall not be less than 50% of the number of samples specified in the table except in particular case of Note 6.
- Note 5:* As far as possible, the number of samples should be distributed equally in time and location.
- Note 6:* The frequency is to be decided by the Competent Authority.

ANNEX III SPECIFICATIONS FOR THE ANALYSIS OF PARAMETERS

The Competent Authority shall ensure that any laboratory where samples are analysed has a system of analytical quality control that is subject to audits from time to time by a person who is not under the control of the laboratory and who is approved by the Competent Authority for that purpose.

1. Parameters for which methods of analysis are specified

The following methods of microbiological parameters are given either for reference whenever a CEN/ISO method is given or for guidance of further CEN/ISO international methods for these parameters. The Competent Authority may use alternative methods when the provisions of Article 14 (5) hereof are met.

Coliform bacteria and *Escherichia coli* (*E. coli*) (ISO 9308-1)

Enterococci (ISO 7899-2)

Enumeration of culturable micro-organisms – Colony count 22 °C (prEN ISO 6222)

Enumeration of culturable micro-organisms – Colony count 37 °C (prEN ISO 6222)

Clostridium perfringens (including spores)

Membrane filtration followed by anaerobic incubation of the membrane on m-CP agar (Note 1) at 44 ± 1 °C for 21 ± 3 hours. Count opaque yellow colonies that run pink or red after exposure to ammonium hydroxide vapours for 20 to 30 seconds.

Note 1: The composition of m-CP agar is:

Basal medium

Tryptose	30g
Yeast extract	20g
Sucrose	5g
L-cysteine hydrochloride	1g
MgSO ₄ · 7H ₂ O	0,1g

Bromocresol purple 40g

Agar 1.5g

Water 1 000g

Dissolve the ingredients of the basal medium, adjust pH to 7.6 and autoclave at 121 °C for 15 minutes. Allow the media to cool and add the following supplements (after sterilising through a membrane filter of pore diameter 0.20 µm):

D-cycloserine	400mg
Polymyxine-B sulphate	25mg
Indoxyl-β-D-glucose	60mg
(to be dissolved in 8 ml sterile water before addition)	

Filter – sterilised 0.5% Phenolphthalein diphosphate solution	20ml
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Filter – sterilised 4.5 % FeCl ₃ . 6H ₂ O	2ml
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2. Parameters for which performance characteristics are specified

- 2.1 For the following parameters, the specified performance characteristics are that the method of analysis used shall be capable of measuring concentrations equal to the parametric value with a trueness, precision and limit of detection specified. Whatever the sensitivity of the method of analysis used, the result shall be expressed using at least the same decimal number] as for the parametric value considered in Annex I of Parts B and C hereof.

Parameters	Trueness % of parametric value (Note 1)	Precision % of parametric value (Note 2)	Limit of detection % of parametric value (Note 3)	Conditions	Notes
Acrylamide				To be controlled by product specification	
Aluminium	10	10	10		
Ammonium	10	10	10		
Antimony	25	25	25		
Arsenic	10	10	10		
Benzo(a)pyrene	25	25	25		
Benzene	25	25	25		
Boron	10	10	10		
Bromate	25	25	25		
Cadmium	10	10	10		
Chloride	10	10	10		
Chromium	10	10	10		
Conductivity	10	10	10		
Copper	10	10	10		
Cyanide	10	10	10		Note 4

1,2-dichloroethane	25	25	10		
Epichlorohydrin				To be controlled by product specification	
Fluoride	10	10	10		
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	25	25	10		Note 5
Pesticides	25	25	25		Note 6
Polycyclic aromatic hydrocarbons	25	25	25		Note 7
Selenium	10	10	10		
Sodium	10	10	10		
Sulphate	10	10	10		
Tetrachloroethene	25	25	10		Note 8
Trichloroethene	25	25	10		Note 8
Trihalomethanes - Total	25	25	10		Note 7
Vinyl chloride				To be controlled by product specification	

2.2 For hydrogen ion concentration, the specified performance characteristics are that the method of analysis used shall be capable of measuring concentrations equal to the parametric value with a trueness of 0.2 pH unit and a precision of 0.2 pH unit.

Note 1 ()*: Trueness is the systematic error and is the difference between the mean value of the large number of repeated measurements and the true value.

Note 2 ()*: Precision is the random error and is usually expressed as the standard deviation (within and between batch) of the spread of results about the mean. Acceptable precision is twice the relative standard deviation.

(*) These terms are further defined in ISO 5725

Note 3: Limit of detection is either:

- three times the relative standard deviation within a batch of a natural sample containing a low concentration of the parameter;
- or

- five times the relative standard deviation within a batch of a blank sample.

Note 4: The method should determine total cyanide in all forms.

Note 5: Oxidation should be carried out for 10 minutes at 100 °C under acid conditions using permanganate.

Note 6: The performance characteristics apply to the particular pesticide and depend on the pesticide concerned. The limit of detection may not be achievable for all pesticides at present, but the Competent Authority should strive to achieve this standard.

Note 7: The performance characteristics apply to the particular substances specified at 2.5% of the parametric value in Annex I hereof.

Note 8: The performance characteristics apply to the particular substances specified at 50% of the parametric value in Annex I hereof.

3. Parameters for which no method of analysis is specified

Colour

Odour

Taste

Total organic carbon

Turbidity (Note 1)

Note 1: For monitoring turbidity in treated surface water the specified performance characteristics is that the method of analysis used shall, as a minimum, be capable of measuring concentrations equal to the parametric value with a trueness of 2.5%, precision of 2.5% and a 2.5% limit of detection.

ANNEX IV
SAMPLING

1. The sample shall be collected in a sterile bottle.
The tap to be sampled should be run long enough to completely flush the pipe supplying the tap, in any case for 2 - 3 minutes, before a water sample is drawn.
Before water sample is drawn from the tap, the tip of the tap shall be flamed using a spirit, and water shall be allowed to flow for 5 minutes before collection.
In cases where the laboratory test is undertaken 3 hours or more after sampling, the bottles shall be kept in ice.
If sample is taken from a chlorinated water supply, any trace of chlorine shall be neutralised immediately after collection. A crystal of sodium thiosulphate or 0.1ml of 2% solution of sodium thiosulphate introduced into the sampling bottle prior to sterilisation serves to neutralise the chlorine.
2. The samples shall be taken from various outlets identified on the reticulation map. A rotation is organised between the identified outlets from which the water is in contact with the product.
Ice shall also be regularly tested.
3. The result of the examination shall have the identification of the outlet where the sample is collected.

ANNEX V
LABORATORIES

1. Samples for check monitoring and audit monitoring laid down in Annex II, Table A hereof shall be collected by an official person and analysed in an official laboratory.
2. The routinely taken samples shall be collected by the management of the establishment and analysed in the in-plant laboratory (approved by the Competent Authority) or in an external private laboratory approved by the Competent Authority. These examinations shall be carried out under the supervision of the official inspector.