

EUROPEAN COMMUNITIES (QUALITY OF SURFACE WATER INTENDED FOR THE ABSTRACTION OF DRINKING WATER) REGULATIONS 1989

The Minister for the Environment in exercise of the powers conferred on him by section 3 of the European Communities Act, 1972 (No. 27 of 1972) and for the purpose of giving effect to the Council Directives of 16th June, 1975 (No. 74/440/EEC)(1) and 9th October, 1979 (No. 79/869/EEC)(2) hereby makes the following Regulations:
(1)O.J. No. L194/26. 25th July, 1975.
(2)O.J. No. L271/44. 29th October, 1979.

REG 1

1. (1) These Regulations may be cited as the European Communities (Quality of Surface Water Intended for the Abstraction of Drinking Water) Regulations, 1989.
- (2) These Regulations shall come into operation on the first day of December, 1989.

REG 2

2. In these Regulations:
 - a reference to the Schedule or an article which is not otherwise identified is a reference to the Schedule or an article of these Regulations;
 - a reference to a sub-article which is not otherwise identified is a reference to a sub-article of the provision in which the reference occurs;
 - "accuracy" means the difference between the true value of the parameter examined and the average experimental value obtained;
 - "limit of detection" means the minimum value of the parameter examined which it is possible to detect;
 - "the Minister" means the Minister for the Environment;
 - "monitoring" includes inspection, measurement, sampling or analysis whether periodically or continuously;
 - "precision" means the range within which 95% of the results of measurements made on a single sample, using the same method, are located;
 - "sanitary authority" means a sanitary authority for the purposes of the Local Government (Sanitary Services) Acts, 1878 to 1964;
 - "surface water" means surface fresh water from which drinking water is abstracted, or intended to be abstracted, and supplied by a distribution network for public use.

REG 3

3. (1) A sanitary authority shall classify surface water in their area in accordance with the quality standards specified in Part II of the Schedule into three categories, A1, A2, A3, which correspond to the standard methods of treatment specified in Part I of the Schedule.
- (2) Where surface waters have been classified in accordance with sub-article (1), it shall be the duty of the sanitary authority to take the necessary measures to ensure that each of the waters concerned meets the quality standards appropriate to its category,

except where a departure is granted under article 5.

(3) Except where a sanitary authority is obliged to act in accordance with article 6 (2) of the European Communities (Quality of Water Intended for Human Consumption) Regulations, 1988, water which does not meet at least the quality standards specified in Part II of the Schedule in respect of category A3 water may not be used for the abstraction of drinking water.

REG 4

4. (1) Where appropriate, and, in particular, where the quality of surface water falls within category A3, a sanitary authority shall prepare an action programme, including a timetable, for the improvement of the water quality.

(2) In determining a timetable for the purposes of sub-article (1), a sanitary authority shall have regard to:—

(a) the need to improve the quality of the environment and, in particular, of surface water, and

(b) the economic and technical constraints which may affect the achievement of the action programme.

REG 5

5. (1) A departure from the quality standards referred to in article 3 (1) may be granted by the Minister to a sanitary authority:—

(a) in the case of floods or other natural disasters,

(b) in the case of the quality standards marked " (o) " where exceptional meteorological or geographical conditions have arisen,

(c) where the quality standards applicable to categories A1, A2 and A3 are exceeded because the surface water concerned has undergone natural enrichment from the soil, without human intervention;

(d) in respect of parameters marked with an asterisk in Part II of the Schedule in the case of surface water in shallow lakes or virtually stagnant surface water.

(2) A departure under sub-article (1) (d) shall apply only to lakes:—

(a) which do not exceed twenty metres in depth,

(b) which have an exchange of water slower than one year, and

(c) without a discharge of waste water into the water body.

(3) An application for a departure under this article shall contain such information as may be specified by the Minister.

(4) The granting of a departure under this article shall be subject to such conditions, if any, and shall have effect for such period as may be specified by the Minister.

(5) A departure under this article shall not constitute a public health hazard.

REG 6

6. (1) A sanitary authority shall regularly monitor the quality of surface water, and for this purpose samples shall be taken for analysis at the point or points at which the water is abstracted prior to treatment.
- (2) For the purposes of sub-article (1), a sanitary authority shall—
- (a) ensure that samples are representative of the quality of the water at the sampling point,
 - (b) have regard to the minimum frequencies of sampling and analysis specified in Part III of the Schedule,
 - (c) as far as practicable, use the methods of analysis specified in Part IV of the Schedule,
 - (d) respect the values specified in Part IV of the Schedule for the limit of detection, and for the precision and accuracy of the specified methods of analysis,
 - (e) ensure that the containers, agents or methods used for the preservation, transport, storage and preparation of samples for analysis of one or more parameters shall not significantly affect the values of the results obtained from samples.
- (3) Surface water shall be deemed to comply with the quality standards specified in Part II of the Schedule where:—
- (a) 95% of samples comply with those standards, and
 - (b) in the case of the 5% of samples which do not comply—
 - (i) the water does not deviate from the standards in question by more than 50%, with the exception of the standards for temperature, pH, dissolved oxygen and the microbiological parameters,
 - (ii) there is no resultant danger to public health, and
 - (iii) no two consecutive samples deviate from the specified quality standards.
- (4) Deviations from the quality standards referred to in sub-article (3) shall not be taken into consideration in determining compliance with these Regulations where the deviations are the result of floods, natural disasters or abnormal weather conditions.
- (5) Notwithstanding sub-article (1), where monitoring of surface water shows that the values of the results obtained from samples for certain parameters are considerably superior to the quality standards specified for those parameters in Part II of the Schedule, a sanitary authority may reduce the frequency of analysis for the parameters concerned.
- (6) Where there is no pollution in the samples referred to in sub-article (5), and there is no risk of the quality of the water deteriorating, and the quality standards of the water are superior to those specified in Part II of the Schedule in respect of category A1, a sanitary authority may decide that no regular monitoring is necessary.

REG 7

7. The Minister may, from time to time, issue recommendations to sanitary authorities in relation to the carrying out of any of their duties under these Regulations, and sanitary authorities shall have regard to any such recommendations.

REG 8

8. Measures taken to apply the provisions of these Regulations shall in no case lead, either directly or indirectly, to deterioration in the existing quality of surface water.

SCHEDULE.

PART I

Definition of the standard methods of treatment for transforming surface water of categories A1, A2 and A3 into drinking water.

Category A1

Simple physical treatment and disinfection, e.g. rapid filtration and disinfection.

Category A2

Normal physical treatment, chemical treatment and disinfection, e.g. prechlorination, coagulation, flocculation, decantation, filtration, disinfection (final chlorination).

Category A3

Intensive physical and chemical treatment, extended treatment and disinfection, e.g. chlorination to break-point, coagulation, flocculation, decantation, filtration, adsorption (activated carbon), disinfection (ozone, final chlorination).

PART II

Surface Water Quality Standards

Parameters	Unit of measurement	Standards for Categories
pH		A1 A2 A3
5.5-8.5	5.5-9.0	5.5-9.0
Colouration (after simple filtration)	mg/1 Pt scale	20 (o) 100 (o) 150 (o) 3.
Total suspended solids	mg/1	SS504.
Temperature	°C	25 (o) 25 (o) 25 (o) 5.
Conductivity	µs/cm-1 at 20 °C	1000 1000 1000
Odour (dilution factor at 25°C)		5 10 20 7.*
Nitrates	mg/1	NO3 50 (o) 50 (o) 8.
Fluorides	mg/1	F 11. 71. 79.*
Dissolved iron	mg/1	Fe 0.22 210.*
Manganese	mg/1	Mn 0.050. 31 11.
Copper	mg/1	Cu 0.05 (o) 0.1 (o) 1 (o) 12.
Zinc	mg/1	Zn 35 51 3.
Boron	mg/1	B 22 21 4.
Arsenic	mg/1	As 0.050. 050. 11 5.
Cadmium	mg/1	Cd 0.00 50. 00 50. 00 51 6.
Total chromium	mg/1	Cr 0.050. 050. 05 1 7.
Lead	mg/1	Pb 0.050. 050. 05 1 8.
Selenium	mg/1	Se 0.010. 010. 01 1 9.
Mercury	mg/1	Hg 0.00 10. 00 10. 00 1 20.
Barium	mg/1	Ba 0.11 1 21.
Cyanide	mg/1	CN 0.050. 050. 05 2 2.
Sulphates	mg/1	SO4 200 200 (o) 200 (o) 23.
Chlorides	mg/1	C 12 50 25 0 25 0 24.
Surfactants (reacting with methylene blue)	mg/1 (laurylsulphate)	0.20. 20. 22 5.*
Phosphates	mg/1	P 20 50. 50. 70. 7 2 6.
Phenols (phenol index) paranitraniline 4-aminoantipyrine	mg/1	C6H5CH0. 000 50. 00 50. 1 2 7.
Dissolved or emulsified hydrocarbons (after extraction by petroleum ether)	mg/10.	010. 21 2 8.
Polycyclic aromatic hydrocarbons	mg/10.	000 20. 000 20. 00 1 2 9.
Total pesticides (parathion, BHC, dieldrin)	mg/10.	000 50. 00 2 50. 00 5 30.*
Chemical oxygen demand (COD)	mg/1	

O24031.*Dissolved oxygen saturation rate% O2>60%>50%>30%32.*Biochemical oxygen demand (BOD5) (at 20 °C without nitrification)mg/1 O2 55733.Nitrogen by Kjeldahl method (except in NO2 and NO3)mg/1 N12334.Ammoniummg/1 NH40.21.54 (o)35.Substances extractable with chloroformmg/1 SEC0.20.4136.Total coliforms 37°C/100 ml5,00025,000100,00037.Faecal coliforms/100 ml1,0005,00040,00038.Faecal streptococci/100 ml2002,00010,00039.SalmonellaNot present in 500 mlNot present in 100 ml
(o) = See article 5 (1) (b).
* = See article 5 (1) (d).

PART III

A. Table of Minimum Frequency of Sampling and Analyses

Category of Surface Water

Population ServedA1A2A3Classification of ParametersClassification of ParametersClassification of ParametersIIIIIIIIIIIIIIIIIIII5001/5*****211500–1,0001/5**1/3**2111,000–5,0001/4**1/2**2115,000–10,0001/3**1/2**21110,000–30,000111/3211/231130,000–100,000211/3421621>100,000321/28411241
1/5 means once in 5 years.
2 means twice per annum.
*Frequency to be determined by the sanitary authority.

B. Table of Classification of Parameters according to Frequency

IIIIIIParameterParameterParameter1. pH9. Dissolved iron8. Fluorides2. Colouration10. Manganese13. Boron3. Total suspended solids11. Copper14. Arsenic12. Zinc15. Cadmium4. Temperature22. Sulphates16. Total chromium5. Conductivity24. Surfactants17. Lead6. Odour26. Phenols18. Selenium7. Nitrates33. Nitrogen by Kjeldahl method19. Mercury23. Chlorides36. Total coliforms20. Barium25. Phosphates37. Faecal coliforms21. Cyanide30. Chemical oxygen demand (COD)27. Dissolved or emulsified hydrocarbons31. Dissolved oxygen saturation rate28. Polycyclic aromatic hydrocarbons32. Biochemical oxygen demand (BOD5)29. Total pesticides34. Ammonium35. Substances extractable with chloroform38. Faecal streptococci39. Salmonella

PART IV

Methods of Analysis

ParameterLimit of DetectionPrecision ±Accuracy ±Methods of Analysis1. pH—0.10.2—Electrometry.
Measured in situ at the time of sampling without prior treatment of the sample.2. Colouration (after simple filtration)510%20%—Filtering through a glass fibre membrane.
Photometric method using the platinum-cobalt scale.3. Total suspended solids—5%10%—Filtering through a 0.45 µm filter membrane, drying at 105°C and weighing.—Centrifuging (for at least 5 mins with mean acceleration of 2800 to 3200 g), drying at 105°C and weighing.4. Temperature—0.51—Thermometry.
Measured in situ at the time of sampling without prior treatment of the sample.5. Conductivity at 20°C—5%10%—Electrometry.6. Odour———By successive dilutions. (Glass container recommended.)7. Nitrates210%20%—Molecular absorption spectrophotometry.8.

Fluorides 0.0510%—Molecular absorption spectrophotometry after distillation if necessary.—Ion selective electrodes.9. Dissolved iron 0.0210%—Atomic absorption spectrophotometry after filtering through a filter membrane (0.45 μm).—Molecular absorption spectrophotometry after filtering through 0.45 μm filter membrane.10. Manganese 0.0110%—Atomic absorption spectrophotometry.0.02(1)10%—Atomic absorption spectrophotometry.—Molecular absorption spectrophotometry.11. Copper(2)0.00510%—Atomic absorption spectrophotometry.—Polarography.0.02(3)10%—Atomic absorption spectrophotometry.—Molecular absorption spectrophotometry.—Polarography.12. Zinc(2)0.0210%—Atomic absorption spectrophotometry.—Molecular absorption spectrophotometry.13. Boron(2)0.110%—Molecular absorption spectrophotometry.—Atomic absorption spectrophotometry. (Materials for container not to contain boron in any significant quantities.)14. Arsenic(2)0.01—Atomic absorption spectrophotometry.—Molecular absorption spectrophotometry.15. Cadmium(2) 0.00130%—Atomic absorption spectrophotometry.—Polarography.16. Total chromium(2)0.0120%—Atomic absorption spectrophotometry.—Molecular absorption spectrophotometry.17. Lead(2) 0.0120%—Atomic absorption spectrophotometry.—Polarography.18. Selenium(2) 0.005—Atomic absorption spectrophotometry.19. Mercury(2) 0.00230%—Flameless atomic absorption spectrophotometry (cold vaporization).20. Barium(2)0.0215%—Atomic absorption spectrophotometry.21. Cyanide 0.0120%—Molecular absorption spectrophotometry.22. Sulphates 1010%—Gravimetric analysis.—EDTA compleximetry.—Molecular absorption spectrophotometry.23. Chlorides 1010%—Titration (Mohr's method).—Molecular absorption spectrophotometry.24. Surfactants (reacting with methylene blue)0.0520%—Molecular absorption spectrophotometry.25. Phosphates 0.0210%—Molecular absorption spectrophotometry.26. Phenols (phenol index)0.00050.00050.0005—Molecular absorption spectrophotometry 4-aminoantipyrine method.0.001(1)30%50%—Paranitraniline method. (Glass container recommended.)27. Dissolved or emulsified hydrocarbons.0.0120%—Infra-red spectrometry after extraction by carbon tetrachloride.0.04(1)—Gravimetry after extraction by petroleum ether. (Glass container recommended.)28. Polycyclic aromatic hydrocarbons(2)0.0000450%50%—Measurement of fluorescence in the UV after thin layer chromatography. Comparative measurement in relation to a mixture of six control substances with the same concentration(4). (Glass or aluminium container recommended.)29. Total pesticides (parathion, hexachlorocyclohexane, dieldrin)(2)0.000150%50%—Gas or liquid chromatography after extraction by suitable solvents and purification. Identification of the constituents of the mixture. Quantitative analysis.(5) (Glass container recommended).30. Chemical oxygen demand (COD)1520%—Potassium dichromate method.31. Dissolved oxygen saturation rate 510%—Winkler's method. (Glass container recommended.)—Electrochemical method.32. Biochemical oxygen demand (BOD₅) at 20°C without nitrification 21.52—Determination of dissolved oxygen before and after five-day incubation at 20°C \pm 1°C, in complete darkness.—Addition of a nitrification inhibitor.33. Nitrogen by Kjeldahl method (except in NO₂ and NO₃)0.030.50.5—Mineralization, distillation by Kjeldahl method and ammonium determination by means of molecular absorption spectrophotometry or titration.34. Ammonium 0.110%—Molecular absorption spectrophotometry.35. Substances extractable with chloroform—Extraction at neutral pH value by purified

chloroform, evaporation in vacuum at room temperature, weighing of residue.36. Total coliforms500—Membrane filtration and culture at 37°C on an appropriate medium (such as Tergitol lactose agar, Endo agar, 0.4% Teepol broth) and colony count.—Samples must be diluted or, where appropriate, concentrated in such a way as to contain between 10 and 100 colonies. If necessary, identification by gasification.500—Method of dilution with fermentation in liquid substrates in at least three tubes in three dilutions. Sub-culturing of the positive tubes on a confirmation medium. Count according to MPN (most probable number). Incubation temperature 37°C + 1°C. (Sterilized glass container recommended.)37. Faecal coliforms100—Membrane filtration and culture at 44°C on an appropriate medium (such as Tergitol lactose agar, Endo agar, 0.4% Teepol broth) and colony count. Samples must be diluted or, where appropriate, concentrated in such a way as to contain between 10 and 100 colonies. If necessary, identification by gasification.100—Method of dilution with fermentation in liquid substrates in at least three tubes in three dilutions. Subculturing of the positive tubes on a confirmation medium. Count according to MPN (most probable number). Incubation temperature 44°C ± 0.5°C. (Sterilized glass container recommended.)38. Faecal streptococci20—Membrane filtration and culture at 37°C on an appropriate medium (such as sodium azide) and colony count. Samples must be diluted or, where appropriate, concentration in such a way as to contain between 10 and 100 colonies.20—Method of dilution in sodium azide broth in at least three tubes with three dilutions. Count according to MPN (most probable number). (Sterilized glass container recommended.)39. Salmonella1/500ml—Concentration by filtration (on membrane or appropriate filter).1/1000ml—Innoculation into pre-enrichment medium. Enrichment and transfer into isolating gelese — Identification.

(Sterilized glass container recommended.)

(1) For surface water of categories A2 and A3.

(2) If the samples contain so much suspended matter as to require special preliminary treatment, the accuracy values shown in this part of the Schedule may, as an exception, be exceeded and shall be regarded as a target. These samples shall be treated so as to ensure that the analysis covers the largest quantity of substances to be measured.

(3) For surface water of category A3.

(4) Mixture of six standard substances all of the same concentration to be taken into consideration: fluoranthene; 3, 4-benzofluoranthene; 1, 12-benzofluoranthene; 3, 4-benzopyrene; 1, 12-benzoperylene; indeno (1, 2, 3-cd) pyrene.

(5) Mixture of three substances all of the same concentration to be taken into consideration: parathion, hexachlorocyclohexane, dieldrin.

GIVEN under the Official Seal of the Minister for the Environment this 10th day of November 1989.

PADRAIG FLYNN,
Minister for the Environment.