

# COMMISSION OF THE EUROPEAN COMMUNITIES

COM(78) 363 final

Brussels, 26 July 1978

Proposal for a

## COUNCIL DIRECTIVE

on the methods of measurement and frequencies of sampling and  
analysis of the parameters of the quality required of  
surface water intended for the abstraction of drinking  
water in the Member States

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(submitted to the Council by the Commission)

COM(78) 363 final

## I. REASONS

### Introduction

This proposal for a directive is for the implementation of Article 5 (2) of Council Directive 75/440/EEC of 16 June 1975 concerning the quality required of surface water intended for the abstraction of drinking water in the Member States<sup>1</sup>.

Title II, Chapter A and paragraph 35 of the European Communities' Environment Programme 1977-1981<sup>2</sup> states that the Commission will implement those measures for which it is responsible and which are provided for in the directives adopted by the Council. These measures include, inter alia, the submission of a draft directive on methods of measurement and the frequency of sampling and analysis for the parameters in Directive 75/440/EEC.

## II. AIM

The aim of this proposal for a directive is to fix :

- standard methods of measuring the parameters for controlling the quality of surface water intended for the abstraction of drinking water ;
- the frequency of sampling and analysis for each parameter (in order to ensure that quality control is undoubtedly effective, a minimum regular sampling frequency has been laid down for surface waters, taking into account the statistical reliability of the data).

In view of the objectives laid down in Article 5(2) of Directive 75/440/EEC, several criteria have to be taken into account when deciding the frequency of sampling, particularly the volume of water abstracted, the size of the population served, the degree of risk due to the quality of the water and seasonal variations in quality.

The sampling frequency decided on in this proposal also takes into account the cost of taking samples and analysing them.

## III. EXISTING CONDITIONS AND REGULATIONS

### Federal Republic of Germany

Germany has uniform standards, laid down by the Association of German Chemists, for analysing water, effluent and sludge (Deutsche Einheitsverfahren zur Wasser-Abwasser- und Schlammuntersuchung - standard German method for analysing water, effluent and sludge). These standards are not

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<sup>1</sup> OJ L 194 of 25 July 1975

<sup>2</sup> OJ C 139 of 13 May 1977

mandatory but are usually applied. The establishment of mandatory methods of measurement, sampling frequencies and methods of analysis is the responsibility of the Länder. Under the authorization issued to works abstracting untreated water for providing drinking water, the Länder may prescribe methods of measurement and the frequency of sampling and analysis for the parameters.

### Belgium

There are no laws or regulations imposing standard methods of measurement or sampling intervals. These vary between measuring and monitoring stations. The Institute of Hygiene and Epidemiology of the Ministry for Public Health and the Family does, however, recommend the application of certain methods but these are not binding.

### Denmark

The Danish Standards Council which is responsible to the Ministry of Trade recommends the use of methods of measuring and analysing water parameters. Although these are merely indicative, they are used throughout the country but are mandatory only where specific decisions make them so.

Most of the standards have been brought into line with those of the neighbouring Scandinavian States - Norway, Sweden and Finland. The standards are regularly updated and adjusted to technical progress.

### France

Article 3 of the Law of 16 December 1964, covering the regulation and allocation of water as well as measures to control water pollution, provides for a national survey of pollution of surface waters. It also states that the technical specifications and the physical, chemical, biological and bacteriological criteria which must be met by water courses, sections of water courses, canals, lakes and ponds, particularly where these are used to provide drinking water for the local population, shall be fixed by decree.

A Decree of 10 January 1969 therefore fixed a procedure for the survey.

Two orders, of 2 September 1969 and 26 November 1975, set out the procedure, particularly rules such as the intervals at which measurements are to be made and a list of the various methods of analysis, to be observed in sampling and analysis.

### Ireland

Article 22 of the 1977 Act on local authority powers to combat water pollution states that it is for the local authority, together with the health authorities, to implement the water surveillance policy. For this purpose the local authorities must fix rules for the sampling, measuring and analysis methods to be applied at points where water is discharged and to receiving waters.

The Act gives the local authority the power to gather all relevant information and provides the necessary equipment and apparatus. Measuring methods and sampling intervals therefore depend on the counties.

#### Italy

Law N° 319 of 14 May 1976 concerning the protection of waters against pollution provides for a national survey of the quality of all waters, whether surface or underground, and the use to which they are put, particularly drinking water.

The Law states that general criteria and methods for determining the characteristics of the waters shall be fixed by the State. A decision of the Ministry of Public Works dated 21 February 1977 therefore fixed the sampling intervals and the parameters to be measured for each category of water. The decision also specified methods of measurement, referring in most cases to the handbook of the national research council's institute of water research (IRSA).

#### Luxembourg

There are no regulations imposing measuring methods or sampling intervals. In general the laboratories work to American or German standards. The intervals at which analyses are carried out depend on need. Water intended for providing drinking water is analysed fairly frequently but at intervals which vary according to laboratory and circumstances.

#### Netherlands

Standardization was initiated by the national water institute which, since 1973, has been publishing quarterly reviews on the quality of national waters intended for the use of local communities. Measuring methods, frequency of sampling and analysis for the parameters are therefore standardized and regulated by the various national institutes responsible for water surveillance, including the national institute for drinking water supplies.

#### United Kingdom

The committee of analysts who form the Department of the Environment's National Water Council have issued a Government publication on the analysis of untreated, drinking and waste water which recommends certain methods of analysis.

The text has been revised to include information on accuracy, precision and limits of detection.

These recommendations are followed throughout the United Kingdom although they are in no way mandatory.

Taking into account the legal situation in the various Member States and the fact that the Treaty does not provide the powers required for the purposes concerned, it will be necessary to use both Article 100 and Article 235 as a legal basis for this proposal for a directive.

Because of the provisions of these Articles, the Opinions of the European Parliament and the Economic and Social Committee will be required.

#### IV. REMARKS ON THE FORMULATION OF THE PROPOSAL FOR A DIRECTIVE

##### IV.1 General

Pursuant to Article 5 (2) of Council Directive 75/440/EEC, the Commission convened a working party of national experts to assist it in drawing up the technical part of this proposal for a directive.

The working party met four times and provided technical information on the methods of measurement used in the Member States as well as the work done by international organizations such as the International Standards Organization (ISO) and the International Union of Pure and Applied Chemistry (IUPAC).

The working party assisted the Commission in establishing the limit of detection, the precision and the accuracy of the methods of measurement used and in fixing the frequency of sampling and analysis for each parameter.

##### IV.2 Scope

This proposal for a directive covers all surface waters coming under Directive 75/440/EEC.

It concerns :

- the standard measuring methods, including the limit of detection, the precision and accuracy for the G and I values of parameters considered in Annex II to Directive 75/440/EEC ;
- the frequency of sampling and analysis for each parameter listed in that Annex.

##### IV.3 Methods of measurement

Directive 75/440/EEC divides surface waters into three categories (A<sub>1</sub>, A<sub>2</sub> and A<sub>3</sub>) for which mandatory and/or guide values, corresponding to the different qualities of the waters, have been fixed.

Because the standard methods are expensive and because of the fairly stringent constraints on the determination of I and/or G values of Category A<sub>1</sub> waters, it has been found necessary to propose two methods of measuring I for certain parameters.

With Category A<sub>2</sub> and A<sub>3</sub> waters, such constraints are not essential when the values to be determined are less strict.

The standard measurement methods, the limit of detection, precision and accuracy are given in Annex I to this proposal for a directive. The Member States are free to choose other methods, provided that the limit of detection, precision and accuracy of the method used conform to the values given in Annex I to this proposal for a Directive.

Sampling and methods of measurement are intended to provide a result which is a correct estimate of the actual average quality of the surface water analysed. The various operations required to obtain this result could introduce errors which must be detected so that they can be eliminated or reduced.

Because there is a risk of substantially modifying values during transport or if samples are carried or kept in containers for a fairly long time (e.g. temperature and pH), Article 3 of this proposal for a directive sets out the conditions to be met when measuring certain parameters.

#### IV. 4. Sampling

The conditions to be met in sampling are set out in Article 4 of this proposal for a directive.

The greatest care should be taken in sampling surface waters since this should be regarded as a preliminary stage of analysis.

Sampling methods must ensure reproducibility of the conditions in which the measurements are made and should be representative of the conditions in the surrounding environment. Article 4 (3) therefore sets out general rules for sampling.

One exception has been made with regard to the sampling of dissolved or emulsified hydrocarbons, these being sampled at the surface.

#### IV. 5. Conservation and transport of samples

As indicated in Article 5, the type of container and packaging must not influence the analysis results.

Samples should be sufficiently large for the measurements required to be made under the best possible conditions for reproducibility.

By their very nature, surface waters are susceptible to fairly rapid changes resulting from the action of the various organisms which they contain. The possibility of changes occurring between the moment of sampling and of analysis should therefore be minimized by carrying out analysis as quickly as possible.

Many experiments have been made with the aim of recommending methods of keeping water samples without altering their composition. However, it is impossible to set hard and fast rules which would cover all cases and situations without exception.

The substances to be measured may be stabilized by adding chemicals to the sample directly after it has been taken or, preferably, but first putting the chemicals in the empty container.

Preservatives should preferably be in the form of fairly concentrated solutions so that only small volumes need be used with the result that in most cases the resulting dilution can be disregarded.

Samples required for determining parameters are transported to a laboratory for the purpose of being examined there as soon as possible. If immediate analysis is not possible, the samples should be preserved in conditions which avoid any contamination from outside the receptacles and prevent any changes in the contents.

#### IV. 6. Sampling frequency

"Sampling frequency" means the number of surface water samples to be taken and analyses made per year. Sampling should be done in accordance with Article 5 (4) of Directive 75/440/EEC, namely at the point of abstraction.

After having consulted national experts, the Commission proposes that the frequency of sampling and analysing each parameter should be fixed every year by the Member States in accordance with Annex II to this proposal for a directive.

The frequency should take account of the population served and the amount of water abstracted.

Where the quality of surface water intended for the production of drinking water is considerably above that required, the Member State concerned may reduce the frequency of sampling and analysis after consulting the Commission. Member States should therefore forward the results of the survey mentioned below to the Commission and inform it of the sampling frequencies they propose to adopt.

Proposal for a Council Directive on the  
methods of measurement and frequencies of sampling and analysis  
of the parameters of the quality required of  
surface water intended for the abstraction of drinking water in the  
Member States

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THE COUNCIL OF THE EUROPEAN COMMUNITIES,

HAVING REGARD to the Treaty establishing the European Economic Community,  
and in particular Articles 100 and 235 thereof,

HAVING REGARD to the proposal from the Commission,

HAVING REGARD to the Opinion of the European Parliament,

HAVING REGARD to the Opinion of the Economic and Social Committee,

WHEREAS the programmes of action of the European Communities on the  
environment (1) provide for the joint establishment, harmonization and  
standardization of methods of measurement and analysis of pollutants for  
determining how pollution evolves in the medium under consideration ;

WHEREAS Article 5(2) of Directive 75/440/EEC of 16 June 1975 concerning the  
quality required of surface water intended for the abstraction of drinking  
water in the Member States (2) and the eighth recital thereof refer to a  
Directive laying down the methods of sampling and analysing the parameters  
defining the physical, chemical and microbiological characteristics of  
surface water intended for the abstraction of drinking water;

WHEREAS any disparity between the provisions already applicable or in  
preparation in the various Member States concerning methods of measure-  
ment and the frequency of sampling and analysis for each parameter to deter-  
mine the quality of surface waters may create unequal conditions of compet-  
ition and consequently directly affect the functioning of the common market ;  
whereas it is therefore necessary to approximate the laws in this field  
under Article 100 of the Treaty ;

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1) O.J. C.112 of 20.12.1973 and C.139 of 13.6.1977

2) O.J. L.194 of 25.7.1975

WHEREAS it seems necessary for this approximation of laws to be accompanied by Community action designed to achieve through more comprehensive legislation one of the objectives of the Community in the sphere of protection of the environment and improvement of the quality of life ; whereas certain specific provisions to this effect should therefore be laid down ; whereas Article 235 of the Treaty should be invoked, as the powers required for this purpose have not been provided by the Treaty ;

WHEREAS in the analyses carried out in the Member States it will be necessary to employ common standard methods to determine the values of the parameters defining the physical, chemical and microbiological characteristics of surface waters intended for the abstraction of drinking water ;

WHEREAS for the purpose of ensuring the required quality control it will be necessary to take a regular minimum number of samples of surface water in order that the parameters specified in Annex II of Directive 75/440/EEC may be measured ;

WHEREAS the minimum frequency of sampling and analysis for each parameter should increase with the volume of water abstracted and the population served ; whereas the frequency should also increase with the degree of risk engendered by the quality of the waters ;

WHEREAS technical progress calls for the speedy adjustment of the requirements defined in Annex I to this Directive and it will therefore be necessary, for the purpose of facilitating implementation of the measures required for this purpose, to make provision for a procedure for close cooperation between the Member States and the Commission meeting in the Committee on the Adaptation of the Directives to Technical Progress established by Council Directive 76/160/EEC of 8 December 1975 concerning the quality of bathing water (1),

HAS ADOPTED THIS DIRECTIVE :

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(1) O.J. L.31 of 5.2.1976

### Article 1

This Directive concerns standard methods of measurement and frequencies of sampling and analysis for the parameters listed in Annex II to Directive 75/440/EEC.

### Article 2

For the purposes of this Directive :

- "standard measuring method" means a succinct description of the procedure for determining the value of the parameters listed in the Annex hereto ;
- "limit of detection" means the minimum value of the parameter examined which it is possible to detect by any method ;
- "accuracy" means the difference between the true value of the parameter examined and the experimental value obtained by any method ;
- "precision" means the difference, within a series of measurements made on a single sample, between each of the results obtained and the average value of those results ;
- "frequency of sampling and analysis" means the number of surface water samples and analyses to be taken or made each year for the purpose of determining the physical, chemical and microbiological characteristics of surface waters intended for the abstraction of drinking water.

### Article 3

1. The standard methods of measurement, their limits of detection, precision and accuracy are set out in Annex I to this Directive.
2. Analysis of samples of surface water taken for the purpose of determining the I and/or G values of the parameters set out in Directive 75/440/EEC shall be carried out in accordance with the values of limit of detection, precision and accuracy set out in Annex I.

3. The Member States shall take all necessary steps to ensure that laboratories using methods of measurement other than those set out in Annex I observe in respect of each parameter the values of limit of detection, precision and accuracy set out in that Annex.
4. The water temperature and the pH value shall be determined in situ at the point of abstraction prior to despatch for purification treatment.

#### Article 4

1. The frequencies of sampling and analysis for each parameter are set out in Annex II to this Directive.
2. As required by Article 5(4) of Directive 75/440/EEC, surface waters shall be sampled at each point of abstraction.
3. Each surface water sample from the point of abstraction shall be taken not less than 50 cm below the surface of the water and at least 50cm above the bottom. Where these requirements cannot be met the samples shall be taken halfway between the surface and the bottom. Sampling shall avoid any degradation in environmental conditions and be representative of water quality at the point of sampling.
4. Samples taken for the purpose of determining dissolved or emulsified hydrocarbons shall be taken at the surface.
5. Surface water samples for the purpose of determining the physical, chemical or microbiological characteristics shown in the G columns of Annex II to Directive 75/440/EEC may be taken on the same dates as samples for the purpose of determining the values given in the I columns of the same annex.

Article 5

1. To preserve the quality of the sample taken, the Member States shall make every endeavour to ensure that containers of the type described in Annex I are used.
2. Laboratories in the Member States using preservatives to conserve surface water samples shall ensure that they do not modify the chemical properties of the water or interfere with the process of analysis.
3. Samples shall be conveyed from the point of abstraction to the analysing laboratory as quickly as possible, in darkness and at a temperature calculated to preserve the chemical, physical and microbiological characteristics of the water.

Article 6

1. The competent authorities of the Member States shall each year fix frequencies of sampling and analysis for each parameter at each point of abstraction in accordance with Annex II to this Directive.
2. For the purposes of determining the values of the parameters given in the I and/or G columns of Annex II to Directive 75/440/EEC, the frequencies of sampling and analysis shall be not less than the minimum frequencies given in Annex II to this Directive.

Article 7

Where a survey by the competent authorities shows that surface waters intended for the abstraction of drinking water are of considerably higher quality than that indicated in column A<sub>1</sub> of Annex II to Directive 75/440/EEC, and where there is no risk of this quality deteriorating the Member State concerned may, after obtaining the consent of the Commission, reduce the frequency of sampling and analysis.

For this purpose the Member States shall send the Commission the results of the survey and inform it of the frequency which they intend to adopt ; the Commission may make its consent subject to certain conditions, chiefly as regards the period of validity of this derogation. Should the danger of a deterioration in the quality of the waters concerned arise the Member States concerned shall take appropriate measures.

Article 8

1. For the purposes of applying this Directive, the Member States shall provide the Commission with all relevant information on :
  - the methods of sampling used ;
  - the list of parameters measured with preservatives present.
2. Within a period not exceeding four years, the Commission shall draw up a consolidated report based on the information gathered pursuant to this Article.
3. The Commission shall assess the effectiveness of the methods of sampling used and the presence of preservatives when parameters are measured and, if appropriate, shall present proposals to the Council for improving the methods of measuring the parameters listed in Annex II to Directive 75/440/EEC.

Article 9

Amendments required to adapt to technical progress :

- the standard methods of measurement set out in Annex I to this Directive;  
and
- the limit of detection, accuracy and precision of the methods,  
shall be decided by the Committee established under Article 10 of Directive 76/160/EEC and in accordance with the procedure set out in Article 11 of that Directive.

Article 10

1. Directive 75/440/EEC is hereby amended as follows :
  - (a) Article 5(2) is deleted ;
  - (b) in Article 5(3) the words "referred to in paragraph 2" shall be replaced by the words "of the parameters of water quality in question".
2. Paragraph 1 shall take effect within two years of the notification of this Directive.

Article 11

The Member States shall bring into force the laws, regulations and administrative provisions needed in order to comply with this Directive within two years of its notification. They shall forthwith inform the Commission thereof.

Article 12

This Directive is addressed to the Member States.

Done at

The

For the Council

The President

A N N E X I

**STANDARD METHODS OF MEASURING THE I AND/OR G VALUES OF THE PARAMETERS IN  
COUNCIL DIRECTIVE 75/440/EEC**

(A)	(B) PARAMETER	(C) Limit of detection	(D) Precision + -	(E) Accuracy + -	(F) Standard Methods of Measuring 1)	(G) Type of container to be used
1	pH pH unit	-	0.1	0.2	- Electrometry Measured in situ at the time of sampling	
2	Coloration (after simple filtration) mg/l Pt scale	-	10%	20%	- Photometric method using the platinum- cobalt scale Prior to measuring, filter through a glass fibre membrane	Glass
3	Total Suspended solids mg/l SS	-	5%	10%	- Filtering through a 0.45 µm filter membrane or centrifuging (for at least 5 mins. with mean acceleration of 2800-3200 g) - Dry at 105°C and weigh	Glass

(A)	(B)	(C)	(D)	(E)	(F)	(G)
4	Temperature °C	-	0,5°C	1°C	- Thermometry - Measured in situ at the time of sampling	
5	Conductivity /µs/cm <sup>-1</sup> à 20°C	-	5%	10%	- Electrometry - Temperature-corrected	Plastic or glass
6	Odour  (Dilution factor at 25°C)	-	-	-	- By successive dilutions - Measurement at 25°C	Glass
7	Nitrates mg/l NO <sub>3</sub>	1	10%	20%	- Molecular absorption spectrophotometry ; may or may not have been preceded by reduction of nitrates into nitrites - Specific electrodes	Plastic or glass
8	Fluorides mg/l F	0,05	10%	20%	- Molecular absorption spectrophotometry after distillation - Specific electrodes	plastic

(A)	(B)	(C)	(D)	(E)	(F)	(G)
9	Total extractable organic chlorine mg/l Cl					
10	Dissolved iron mg/l Fe	0.02	10%	20%	- Atomic absorption spectrometry after filtering the sample through a 0.45 $\mu$ m filter membrane - Molecular absorption spectrometry after filtering the sample through a 0.45 $\mu$ m filter membrane	Glass
11	Manganese mg/l Mn	0.01(2) 0.02(3)	10%	20%	- Atomic absorption spectrometry - Molecular absorption spectrophotometry	Glass
12	Copper mg/l Cu	0.005 0.02 (4)	10%	20%	- Atomic absorption spectrometry - Molecular absorption spectrophotometry	Glass
13	Zinc mg/l Zn	0.02 (2) 0.01	10%	20%	- Atomic absorption spectrometry - Molecular absorption spectrophotometry	Glass

(A)	(B)	(C)	(D)	(E)	(F)	(G)
14	Boron mg/l B	0.05	10%	20%	- Atomic absorption spectrometry - Molecular absorption spectrophotometry	Plastic
15	Beryllium mg/l Be					
16	Cobalt mg/l Co					
17	Nickel mg/l Ni					
18	Vanadium mg/l V					

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(A)	(B)	(C)	(D)	(E)	(F)	(G)
19	Arsenic mg/l As	0.002 (2) 0.01 (5)	10%	20%	- Atomic absorption spectrometry - Molecular absorption spectrophotometry	Glass
20	Cadmium mg/l Cd	0.0002 0.001 (5)	15%	30%	- Atomic absorption spectrometry	Glass
21	Total chromium mg/l Cr	0.01	15%	20%	- Atomic absorption spectrometry - Molecular absorption spectrophotometry	Glass
22	Lead mg/l Pb	0.01	15%	30%	- Atomic absorption spectrometry	Glass
23	Selenium mg/l Se	0.005	15%	30%	- Atomic absorption spectrometry	Glass

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(A)	(B)	(C)	(D)	(E)	(F)	(G)
24	Mercury mg/l Hg	0.0001 0.0002(5)	15%	30%	- Flameless atomic absorption spectrometry	glass
25	Barium mg/l Ba	0.02	15%	20%	- Atomic absorption spectrometry	glass
26	Cyanide mg/l Cn	0.01	15%	30%	- Molecular absorption spectrophotometry using a specific reagent after distillation	plastic
27	Sulphates mg/l SO <sub>4</sub>	10	5%	10%	- Gravimetric analysis; EDTA compleximetry	glass
28	Chlorides mg/l Cl	10	5%	10%	- Titration (Mohr's method)	glass

(A)	(B)	(C)	(D)	(E)	(F)	(G)
29	Surfactants (reacting with methyl blue) mg/l (Lauryl Sulphate)	0.05	20%	20%	- Molecular absorption spectrophotometry	Glass
30	Phosphates mg/l P <sub>2</sub> O <sub>5</sub>	0.02	10%	20%	- Molecular absorption spectrophotometry after reduction of the phosphomolybdic complex	Glass
31	Phenols (phenol index) mg/l C <sub>6</sub> H <sub>5</sub> OH paranitraniline 4 aminoantipyrine	0.0002 0.001 (6)	15%	50%	- Molecular absorption spectrophotometry	Glass
32	Dissolved or emulsified hydrocarbons (after extraction by petroleum ether)	0.01 0.04 (3)	20%	30%	- Gravimetry	Glass
33	Polycyclic aromatic hydrocarbons mg/l	0.00004	30%	50%	- Measurement of fluorescence in the UV after thin layer chromatography - Comparative measurements in relation to a mixture of six control substances with the same concentration (8)	Glass

(A)	(B)	(C)	(D)	(E)	(F)	(G)
34	Total pesticides mg/l (parathion, BHC dieldrin)	0.0001	30%	50%	- Gas chromatography using an electron capture detector, after extraction by suitable solvents and purification - Identification of the substances - Quantitative analysis (9)	Glass
35	Chemical oxygen demand (COD) mg/l O <sub>2</sub>	5	20%	20%	- Potassium dichromate method	Glass
36	Dissolved oxygen saturation rate % O <sub>2</sub>	5% saturation	5% saturation	10% saturation	- Winkler's method - Specific electrode (electrochemical method)	Glass
37	Biochemical oxygen demand (BOD <sub>5</sub> ) at 20°C mg/l O <sub>2</sub> without nitrification	2	20%	20%	- Determination of dissolved oxygen as in 36 above before and after five-day incubation at 20°C + 1°C, in complete darkness - Container completely filled, with no air	Glass
38	Nitrogen by Kjeldahl method (except NO <sub>3</sub> ) mg/l N	0.5	10%	20%	- Determination of organic and ammoniacal nitrogen after mineralization and distillation followed by molecular absorption spectrophotometry or titration	Glass

(A)	(B)	(C)	(D)	(E)	(F)	(G)
39	Ammonia mg/l NH <sub>4</sub>	0.01 (2) 0.05 (3)	10%	20%	- Molecular absorption spectrophotometry using indophenol blue	Glass
40	Substances extractable with chloroform mg/l SEC	0.02 (2) 0,1 (7)	-	-	- Extraction by chloroform purified to a neutral pH, Weigh residue	Glass
41	Total organic carbon mg/l C					
42	Residual organic carbon after floculation and membrane filtration (5 $\mu$ ) TOC mg/l C					

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(A)	(B)	(C)	(D)	(E)	(F)	(G)
43	Total coliforms 37°C /100 ml	5 (2) 500 (7)	35%		<p>- Culture on and/or in an appropriate specific solid medium (such as Tergitol lactose agar, endo agar, 0.4% Teepol broth) with filtration (2) or without filtration (7) and enumeration of colonies</p> <p>or</p> <p>- Fermentation in multiple tubes. Sub-culturing of the positive tubes on a confirmation medium. Count according to MPN (most probable number)</p> <p>- Incubation temperature : 37°C ± 1°C</p>	Sterilized glass
44	Faecal coliforms /100 ml	2 (2) 200 (7)	35%		<p>- Culture in and/or on an appropriate specific solid medium (such as Tergitol lactose agar, endo agar, 0.4% Teepol broth) with filtration (2) or without filtration (7) and enumeration of colonies</p> <p>or</p> <p>- Fermentation in multiple tubes. Sub-culturing of the positive tubes on a confirmation medium. Count according to MPN (most probable number)</p> <p>- Incubation temperature 44°C ± 0.5°C</p>	Sterilized glass

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(A)	(B)	(C)	(D)	(E)	(F)	(G)
45	Faecal streptococci /100 ml.	2 (2) 200 (7)	35%		- Culture in and/or on an appropriate solid medium using sodium azide, with filtration (2) or without filtration (7) and enumeration of colonies or - Fermentation in multiple tubes. Count according to MPN (most probable number)	Sterilized glass
46	Salmonella	Not present 5000 ml Not present 1000 ml	80%		- Concentration by membrane filtration. Inoculation into pre-enrichment medium - enrichment and transfer into isolating gelose - identification	Sterilized glass

- 1 Surface water samples taken at the abstraction point are analysed and measured after simple filtration (wire mesh sieve) to remove any floating debris such as wood, plastic, glass containers.
- 2 For waters of Category A<sub>1</sub> G value
- 3 For waters of Categories A<sub>2</sub> and A<sub>3</sub>
- 4 For waters of Category A<sub>3</sub>
- 5 For waters of Categories A<sub>1</sub>, A<sub>2</sub> and A<sub>3</sub>, I value.
- 6 For waters of Categories A<sub>2</sub>, I value and A<sub>3</sub>
- 7 For waters of Categories A<sub>2</sub> and A<sub>3</sub>, G value.
- 8 Mixture of six standard substances all of the same concentration to be taken into consideration: fluoranthene; 3,4 benzofluoranthene; 11,12-benzofluoranthene; 3,4-benzopyrene; 1,12 benzoperylene; indeno-1,2,3-cd pyrene.
- 9 Mixture of three substances all of the same concentration to be taken into consideration: parathion, BHC, dieldrin.

ANNEX II

Frequency of sampling and analysis for each parameter in  
Council Directive 75/440/EEC

Minimum annual frequency

Population served No of inhabitants*	<100 000	>100 000
Category A1 water	1	3
Category A2 water	2	6
Category A3 water	4	12

\* Volume of water abstracted: 20 000 m<sup>3</sup>/day  
(calculation basis: 200 l/day per inhabitant).