

Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy

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## ANNEX I

### INFORMATION REQUIRED FOR THE LIST OF COMPETENT AUTHORITIES

As required under Article 3(8), the Member States shall provide the following information on all competent authorities within each of its river basin districts as well as the portion of any international river basin district lying within their territory.

- (i) *Name and address of the competent authority* — the official name and address of the authority identified under Article 3(2).
- (ii) *Geographical coverage of the river basin district* — the names of the main rivers within the river basin district together with a precise description of the boundaries of the river basin district. This information should as far as possible be available for introduction into a geographic information system (GIS) and/or the geographic information system of the Commission (GISCO).
- (iii) *Legal status of competent authority* — a description of the legal status of the competent authority and, where relevant, a summary or copy of its statute, founding treaty or equivalent legal document.
- (iv) *Responsibilities* — a description of the legal and administrative responsibilities of each competent authority and of its role within each river basin district.
- (v) *Membership* — where the competent authority acts as a coordinating body for other competent authorities, a list is required of these bodies together with a summary of the institutional relationships established in order to ensure coordination.
- (vi) *International relationships* — where a river basin district covers the territory of more than one Member State or includes the territory of non-Member States, a summary is required of the institutional relationships established in order to ensure coordination.

## ANNEX II

### 1 SURFACE WATERS

#### 1.1. Characterisation of surface water body types

Member States shall identify the location and boundaries of bodies of surface water and shall carry out an initial characterisation of all such bodies in accordance with the following methodology. Member States may group surface water bodies together for the purposes of this initial characterisation.

- (i) The surface water bodies within the river basin district shall be identified as falling within either one of the following surface water categories — rivers, lakes, transitional waters or coastal waters — or as artificial surface water bodies or heavily modified surface water bodies.
- (ii) For each surface water category, the relevant surface water bodies within the river basin district shall be differentiated according to type. These types are those defined using either ‘system A’ or ‘system B’ identified in section 1.2.
- (iii) If system A is used, the surface water bodies within the river basin district shall first be differentiated by the relevant ecoregions in accordance with the geographical areas

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identified in section 1.2 and shown on the relevant map in Annex XI. The water bodies within each ecoregion shall then be differentiated by surface water body types according to the descriptors set out in the tables for system A.

- (iv) If system B is used, Member States must achieve at least the same degree of differentiation as would be achieved using system A. Accordingly, the surface water bodies within the river basin district shall be differentiated into types using the values for the obligatory descriptors and such optional descriptors, or combinations of descriptors, as are required to ensure that type specific biological reference conditions can be reliably derived.
- (v) For artificial and heavily modified surface water bodies the differentiation shall be undertaken in accordance with the descriptors for whichever of the surface water categories most closely resembles the heavily modified or artificial water body concerned.
- (vi) Member States shall submit to the Commission a map or maps (in a GIS format) of the geographical location of the types consistent with the degree of differentiation required under system A.

## 1.2. Ecoregions and surface water body types

### 1.2.1. Rivers

#### SYSTEM A

Fixed typology	Descriptors
Ecoregion	Ecoregions shown on map A in Annex XI
Type	Altitude typology high : >800 m mid- : 200 to 800 m altitude lowland : <200 m Size typology based on catchment area small : 10 to 100 km <sup>2</sup> medium : >100 to 1 000 km <sup>2</sup> large : >1 000 to 10 000 km <sup>2</sup> very large : >10 000 km <sup>2</sup> Geology calcareous siliceous organic

#### SYSTEM B

Alternative characterisation	Physical and chemical factors that determine the characteristics of the river or part of the river and hence the biological population structure and composition

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Obligatory factors	altitude latitude longitude geology size
Optional factors	distance from river source energy of flow (function of flow and slope) mean water width mean water depth mean water slope form and shape of main river bed river discharge (flow) category valley shape transport of solids acid neutralising capacity mean substratum composition chloride air temperature range mean air temperature precipitation

### 1.2.2. Lakes

#### SYSTEM A

Fixed typology	Descriptors
Ecoregion	Ecoregions shown on map A in Annex XI
Type	Altitude typology high : >800 m mid- : 200 to 800 m altitude lowland : <200 m Depth typology based on mean depth <3 m 3 to 15 m >15 m Size typology based on surface area 0,5 to 1 km <sup>2</sup> 1 to 10 km <sup>2</sup> 10 to 100 km <sup>2</sup> >100 km <sup>2</sup> Geology calcareous siliceous organic

## SYSTEM B

<b>Alternative characterisation</b>	<b>Physical and chemical factors that determine the characteristics of the lake and hence the biological population structure and composition</b>
Obligatory factors	altitude latitude longitude depth geology size
Optional factors	mean water depth lake shape residence time mean air temperature air temperature range mixing characteristics (e.g. monomictic, dimictic, polymictic) acid neutralising capacity background nutrient status mean substratum composition water level fluctuation

## 1.2.3. Transitional Waters

## SYSTEM A

<b>Fixed typology</b>	<b>Descriptors</b>
Ecoregion	The following as identified on map B in Annex XI: Baltic Sea Barents Sea Norwegian Sea North Sea North Atlantic Ocean Mediterranean Sea
Type	Based on mean annual salinity <0,5‰ : freshwater 0,5 to : oligohaline <5‰ 5 to : mesohaline <18‰ 18 to : polyhaline <30‰ 30 to : euhaline <40‰ Based on mean tidal range <2 m : microtidal

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2 to 4 m : mesotidal  
>4 m : macrotidal

## SYSTEM B

<b>Alternative characterisation</b>	<b>Physical and chemical factors that determine the characteristics of the transitional water and hence the biological population structure and composition</b>
Obligatory factors	latitude longitude tidal range salinity
Optional factors	depth current velocity wave exposure residence time mean water temperature mixing characteristics turbidity mean substratum composition shape water temperature range

## 1.2.4. Coastal Waters

## SYSTEM A

<b>Fixed typology</b>	<b>Descriptors</b>
Ecoregion	The following as identified on map B in Annex XI: Baltic Sea Barents Sea Norwegian Sea North Sea North Atlantic Ocean Mediterranean Sea
Type	Based on mean annual salinity <0,5‰ : freshwater 0,5 to <5‰ : oligohaline 5 to <18‰ : mesohaline 18 to <30‰ : polyhaline 30 to <40‰ : euhaline Based on mean depth

	shallow : <30 m waters intermediate (30 to 200 m) deep : >200 m
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## SYSTEM B

<b>Alternative characterisation</b>	<b>Physical and chemical factors that determine the characteristics of the coastal water and hence the biological community structure and composition</b>
Obligatory factors	latitude longitude tidal range salinity
Optional factors	current velocity wave exposure mean water temperature mixing characteristics turbidity retention time (of enclosed bays) mean substratum composition water temperature range

## 1.3. Establishment of type-specific reference conditions for surface water body types

- (i) For each surface water body type characterised in accordance with section 1.1, type-specific hydromorphological and physicochemical conditions shall be established representing the values of the hydromorphological and physicochemical quality elements specified in point 1.1 in Annex V for that surface water body type at high ecological status as defined in the relevant table in point 1.2 in Annex V. Type-specific biological reference conditions shall be established, representing the values of the biological quality elements specified in point 1.1 in Annex V for that surface water body type at high ecological status as defined in the relevant table in section 1.2 in Annex V.
- (ii) In applying the procedures set out in this section to heavily modified or artificial surface water bodies references to high ecological status shall be construed as references to maximum ecological potential as defined in table 1.2.5 of Annex V. The values for maximum ecological potential for a water body shall be reviewed every six years.
- (iii) Type-specific conditions for the purposes of points (i) and (ii) and type-specific biological reference conditions may be either spatially based or based on modelling, or may be derived using a combination of these methods. Where it is not possible to use these methods, Member States may use expert judgement to establish such conditions. In defining high ecological status in respect of concentrations of specific synthetic pollutants, the detection limits are those which can be achieved in accordance with the available techniques at the time when the type-specific conditions are to be established.
- (iv) For spatially based type-specific biological reference conditions, Member States shall develop a reference network for each surface water body type. The network shall

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contain a sufficient number of sites of high status to provide a sufficient level of confidence about the values for the reference conditions, given the variability in the values of the quality elements corresponding to high ecological status for that surface water body type and the modelling techniques which are to be applied under paragraph (v).

- (v) Type-specific biological reference conditions based on modelling may be derived using either predictive models or hindcasting methods. The methods shall use historical, palaeological and other available data and shall provide a sufficient level of confidence about the values for the reference conditions to ensure that the conditions so derived are consistent and valid for each surface water body type.
- (vi) Where it is not possible to establish reliable type-specific reference conditions for a quality element in a surface water body type due to high degrees of natural variability in that element, not just as a result of seasonal variations, then that element may be excluded from the assessment of ecological status for that surface water type. In such circumstances Member States shall state the reasons for this exclusion in the river basin management plan.

#### 1.4. Identification of Pressures

Member States shall collect and maintain information on the type and magnitude of the significant anthropogenic pressures to which the surface water bodies in each river basin district are liable to be subject, in particular the following.

Estimation and identification of significant point source pollution, in particular by substances listed in Annex VIII, from urban, industrial, agricultural and other installations and activities, based, *inter alia*, on information gathered under:

- (i) Articles 15 and 17 of Directive 91/271/EEC;
- (ii) Articles 9 and 15 of Directive 96/61/EC<sup>(1)</sup>;

and for the purposes of the initial river basin management plan:

- (iii) Article 11 of Directive 76/464/EEC; and
- (iv) Directives 75/440/EC, 76/160/EEC<sup>(2)</sup>, 78/659/EEC and 79/923/EEC<sup>(3)</sup>.

Estimation and identification of significant diffuse source pollution, in particular by substances listed in Annex VIII, from urban, industrial, agricultural and other installations and activities; based, *inter alia*, on information gathered under:

- (i) Articles 3, 5 and 6 of Directive 91/676/EEC<sup>(4)</sup>;
- (ii) Articles 7 and 17 of Directive 91/414/EEC;
- (iii) Directive 98/8/EC;

and for the purposes of the first river basin management plan:

- (iv) Directives 75/440/EEC, 76/160/EEC, 76/464/EEC, 78/659/EEC and 79/923/EEC.

Estimation and identification of significant water abstraction for urban, industrial, agricultural and other uses, including seasonal variations and total annual demand, and of loss of water in distribution systems.



Estimation and identification of the impact of significant water flow regulation, including water transfer and diversion, on overall flow characteristics and water balances.

Identification of significant morphological alterations to water bodies.

Estimation and identification of other significant anthropogenic impacts on the status of surface waters.

Estimation of land use patterns, including identification of the main urban, industrial and agricultural areas and, where relevant, fisheries and forests.

### 1.5. Assessment of Impact

Member States shall carry out an assessment of the susceptibility of the surface water status of bodies to the pressures identified above.

Member States shall use the information collected above, and any other relevant information including existing environmental monitoring data, to carry out an assessment of the likelihood that surface waters bodies within the river basin district will fail to meet the environmental quality objectives set for the bodies under Article 4. Member States may utilise modelling techniques to assist in such an assessment.

For those bodies identified as being at risk of failing the environmental quality objectives, further characterisation shall, where relevant, be carried out to optimise the design of both the monitoring programmes required under Article 8, and the programmes of measures required under Article 11.

## 2. GROUNDWATERS

### 2.1. Initial characterisation

Member States shall carry out an initial characterisation of all groundwater bodies to assess their uses and the degree to which they are at risk of failing to meet the objectives for each groundwater body under Article 4. Member States may group groundwater bodies together for the purposes of this initial characterisation. This analysis may employ existing hydrological, geological, pedological, land use, discharge, abstraction and other data but shall identify:

- the location and boundaries of the groundwater body or bodies,
- the pressures to which the groundwater body or bodies are liable to be subject including:
  - diffuse sources of pollution
  - point sources of pollution
  - abstraction
  - artificial recharge,
- the general character of the overlying strata in the catchment area from which the groundwater body receives its recharge,
- those groundwater bodies for which there are directly dependent surface water ecosystems or terrestrial ecosystems.

### 2.2. Further characterisation

Following this initial characterisation, Member States shall carry out further characterisation of those groundwater bodies or groups of bodies which have been identified as being at risk in order to establish a more precise assessment of the significance of such risk and identification of any measures to be required under Article 11. Accordingly, this characterisation shall include relevant information on the impact of human activity and, where relevant, information on:

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- geological characteristics of the groundwater body including the extent and type of geological units,
- hydrogeological characteristics of the groundwater body including hydraulic conductivity, porosity and confinement,
- characteristics of the superficial deposits and soils in the catchment from which the groundwater body receives its recharge, including the thickness, porosity, hydraulic conductivity, and absorptive properties of the deposits and soils,
- stratification characteristics of the groundwater within the groundwater body,
- an inventory of associated surface systems, including terrestrial ecosystems and bodies of surface water, with which the groundwater body is dynamically linked,
- estimates of the directions and rates of exchange of water between the groundwater body and associated surface systems,
- sufficient data to calculate the long term annual average rate of overall recharge,
- characterisation of the chemical composition of the groundwater, including specification of the contributions from human activity. Member States may use typologies for groundwater characterisation when establishing natural background levels for these bodies of groundwater.

### 2.3. Review of the impact of human activity on groundwaters

For those bodies of groundwater which cross the boundary between two or more Member States or are identified following the initial characterisation undertaken in accordance with paragraph 2.1 as being at risk of failing to meet the objectives set for each body under Article 4, the following information shall, where relevant, be collected and maintained for each groundwater body:

- (a) the location of points in the groundwater body used for the abstraction of water with the exception of:
  - points for the abstraction of water providing less than an average of 10 m<sup>3</sup> per day, or,
  - points for the abstraction of water intended for human consumption providing less than an average of 10 m<sup>3</sup> per day or serving less than 50 persons,
- (b) the annual average rates of abstraction from such points,
- (c) the chemical composition of water abstracted from the groundwater body,
- (d) the location of points in the groundwater body into which water is directly discharged,
- (e) the rates of discharge at such points,
- (f) the chemical composition of discharges to the groundwater body, and
- (g) land use in the catchment or catchments from which the groundwater body receives its recharge, including pollutant inputs and anthropogenic alterations to the recharge characteristics such as rainwater and run-off diversion through land sealing, artificial recharge, damming or drainage.

### 2.4. Review of the impact of changes in groundwater levels

Member States shall also identify those bodies of groundwater for which lower objectives are to be specified under Article 4 including as a result of consideration of the effects of the status of the body on:

- (i) surface water and associated terrestrial ecosystems
- (ii) water regulation, flood protection and land drainage
- (iii) human development.

#### 2.5. Review of the impact of pollution on groundwater quality

Member States shall identify those bodies of groundwater for which lower objectives are to be specified under Article 4(5) where, as a result of the impact of human activity, as determined in accordance with Article 5(1), the body of groundwater is so polluted that achieving good groundwater chemical status is infeasible or disproportionately expensive.

### ANNEX III

#### ECONOMIC ANALYSIS

The economic analysis shall contain enough information in sufficient detail (taking account of the costs associated with collection of the relevant data) in order to:

- (a) make the relevant calculations necessary for taking into account under Article 9 the principle of recovery of the costs of water services, taking account of long term forecasts of supply and demand for water in the river basin district and, where necessary:
  - estimates of the volume, prices and costs associated with water services, and
  - estimates of relevant investment including forecasts of such investments;
- (b) make judgements about the most cost-effective combination of measures in respect of water uses to be included in the programme of measures under Article 11 based on estimates of the potential costs of such measures.

### ANNEX IV

#### PROTECTED AREAS

- 1. The register of protected areas required under Article 6 shall include the following types of protected areas:
  - (i) areas designated for the abstraction of water intended for human consumption under Article 7;
  - (ii) areas designated for the protection of economically significant aquatic species;
  - (iii) bodies of water designated as recreational waters, including areas designated as bathing waters under Directive 76/160/EEC;
  - (iv) nutrient-sensitive areas, including areas designated as vulnerable zones under Directive 91/676/EEC and areas designated as sensitive areas under Directive 91/271/EEC; and
  - (v) areas designated for the protection of habitats or species where the maintenance or improvement of the status of water is an important factor in their protection, including

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relevant Natura 2000 sites designated under Directive 92/43/EEC<sup>(5)</sup> and Directive 79/409/EEC<sup>(6)</sup>.

2. The summary of the register required as part of the river basin management plan shall include maps indicating the location of each protected area and a description of the Community, national or local legislation under which they have been designated.

## ANNEX V

### 1. SURFACE WATER STATUS

#### 1.1. Quality elements for the classification of ecological status

##### 1.1.1. Rivers

##### Biological elements

Composition and abundance of aquatic flora

Composition and abundance of benthic invertebrate fauna

Composition, abundance and age structure of fish fauna

##### Hydromorphological elements supporting the biological elements

Hydrological regime

quantity and dynamics of water flow

connection to groundwater bodies

River continuity

Morphological conditions

river depth and width variation

structure and substrate of the river bed

structure of the riparian zone

##### Chemical and physico-chemical elements supporting the biological elements

General

Thermal conditions

Oxygenation conditions

Salinity

Acidification status

Nutrient conditions

Specific pollutants

Pollution by all priority substances identified as being discharged into the body of water

Pollution by other substances identified as being discharged in significant quantities into the body of water

##### 1.1.2. Lakes

##### Biological elements

Composition, abundance and biomass of phytoplankton

Composition and abundance of other aquatic flora

Composition and abundance of benthic invertebrate fauna

Composition, abundance and age structure of fish fauna

##### Hydromorphological elements supporting the biological elements

Hydrological regime

quantity and dynamics of water flow

residence time

connection to the groundwater body

Morphological conditions

lake depth variation

quantity, structure and substrate of the lake bed

structure of the lake shore

Chemical and physico-chemical elements supporting the biological elements

General

Transparency

Thermal conditions

Oxygenation conditions

Salinity

Acidification status

Nutrient conditions

Specific pollutants

Pollution by all priority substances identified as being discharged into the body of water

Pollution by other substances identified as being discharged in significant quantities into the body of water

1.1.3. Transitional waters

Biological elements

Composition, abundance and biomass of phytoplankton

Composition and abundance of other aquatic flora

Composition and abundance of benthic invertebrate fauna

Composition and abundance of fish fauna

Hydro-morphological elements supporting the biological elements

Morphological conditions

depth variation

quantity, structure and substrate of the bed

structure of the intertidal zone

Tidal regime

freshwater flow

wave exposure

Chemical and physico-chemical elements supporting the biological elements

General

Transparency

Thermal conditions

Oxygenation conditions

Salinity

Nutrient conditions

Specific pollutants

Pollution by all priority substances identified as being discharged into the body of water

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Pollution by other substances identified as being discharged in significant quantities into the body of water

#### 1.1.4. Coastal waters

##### Biological elements

Composition, abundance and biomass of phytoplankton

Composition and abundance of other aquatic flora

Composition and abundance of benthic invertebrate fauna

##### Hydromorphological elements supporting the biological elements

###### Morphological conditions

depth variation

structure and substrate of the coastal bed

structure of the intertidal zone

###### Tidal regime

direction of dominant currents

wave exposure

##### Chemical and physico-chemical elements supporting the biological elements

###### General

Transparency

Thermal conditions

Oxygenation conditions

Salinity

Nutrient conditions

###### Specific pollutants

Pollution by all priority substances identified as being discharged into the body of water

Pollution by other substances identified as being discharged in significant quantities into the body of water

#### 1.1.5. Artificial and heavily modified surface water bodies

The quality elements applicable to artificial and heavily modified surface water bodies shall be those applicable to whichever of the four natural surface water categories above most closely resembles the heavily modified or artificial water body concerned.

#### 1.2. Normative definitions of ecological status classifications

Table General definition for rivers, lakes, transitional waters and coastal waters

##### 1.2.

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The following text provides a general definition of ecological quality. For the purposes of classification the values for the quality elements of ecological status for each surface water category are those given in tables 1.2.1 to 1.2.4 below.

Element	High status	Good status	Moderate status
General	There are no, or only very minor, anthropogenic alterations to the values of the physico-chemical and	The values of the biological quality elements for the surface water body type show low levels of distortion resulting	The values of the biological quality elements for the surface water body type deviate moderately from

The following text provides a general definition of ecological quality. For the purposes of classification the values for the quality elements of ecological status for each surface water category are those given in tables 1.2.1 to 1.2.4 below.

	<p>hydromorphological quality elements for the surface water body type from those normally associated with that type under undisturbed conditions.</p> <p>The values of the biological quality elements for the surface water body reflect those normally associated with that type under undisturbed conditions, and show no, or only very minor, evidence of distortion.</p> <p>These are the type-specific conditions and communities.</p>	<p>from human activity, but deviate only slightly from those normally associated with the surface water body type under undisturbed conditions.</p>	<p>those normally associated with the surface water body type under undisturbed conditions. The values show moderate signs of distortion resulting from human activity and are significantly more disturbed than under conditions of good status.</p>
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Waters achieving a status below moderate shall be classified as poor or bad.

Waters showing evidence of major alterations to the values of the biological quality elements for the surface water body type and in which the relevant biological communities deviate substantially from those normally associated with the surface water body type under undisturbed conditions, shall be classified as poor.

Waters showing evidence of severe alterations to the values of the biological quality elements for the surface water body type and in which large portions of the relevant biological communities normally associated with the surface water body type under undisturbed conditions are absent, shall be classified as bad.

#### 1.2.1. Definitions for high, good and moderate ecological status in rivers

##### BIOLOGICAL QUALITY ELEMENTS

Element	High status	Good status	Moderate status
Phytoplankton	<p>The taxonomic composition of phytoplankton corresponds totally or nearly totally to undisturbed conditions.</p> <p>The average phytoplankton</p>	<p>There are slight changes in the composition and abundance of planktonic taxa compared to the type-specific communities.</p> <p>Such changes do not indicate any</p>	<p>The composition of planktonic taxa differs moderately from the type-specific communities.</p> <p>Abundance is moderately disturbed and may be such as to produce a significant</p>

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	<p>abundance is wholly consistent with the type-specific physico-chemical conditions and is not such as to significantly alter the type-specific transparency conditions. Planktonic blooms occur at a frequency and intensity which is consistent with the type-specific physico-chemical conditions.</p>	<p>accelerated growth of algae resulting in undesirable disturbances to the balance of organisms present in the water body or to the physico-chemical quality of the water or sediment. A slight increase in the frequency and intensity of the type-specific planktonic blooms may occur.</p>	<p>undesirable disturbance in the values of other biological and physico-chemical quality elements. A moderate increase in the frequency and intensity of planktonic blooms may occur. Persistent blooms may occur during summer months.</p>
Macrophytes and phytobenthos	<p>The taxonomic composition corresponds totally or nearly totally to undisturbed conditions. There are no detectable changes in the average macrophytic and the average phytobenthic abundance.</p>	<p>There are slight changes in the composition and abundance of macrophytic and phytobenthic taxa compared to the type-specific communities. Such changes do not indicate any accelerated growth of phytobenthos or higher forms of plant life resulting in undesirable disturbances to the balance of organisms present in the water body or to the physico-chemical quality of the water or sediment. The phytobenthic community is not adversely affected by bacterial tufts and coats present due to anthropogenic activity.</p>	<p>The composition of macrophytic and phytobenthic taxa differs moderately from the type-specific community and is significantly more distorted than at good status. Moderate changes in the average macrophytic and the average phytobenthic abundance are evident. The phytobenthic community may be interfered with and, in some areas, displaced by bacterial tufts and coats present as a result of anthropogenic activities.</p>
Benthic invertebrate fauna	<p>The taxonomic composition and abundance correspond totally or nearly totally</p>	<p>There are slight changes in the composition and abundance of invertebrate taxa</p>	<p>The composition and abundance of invertebrate taxa differ moderately from the type-specific communities.</p>



	<p>to undisturbed conditions. The ratio of disturbance sensitive taxa to insensitive taxa shows no signs of alteration from undisturbed levels. The level of diversity of invertebrate taxa shows no sign of alteration from undisturbed levels.</p>	<p>from the type-specific communities. The ratio of disturbance-sensitive taxa to insensitive taxa shows slight alteration from type-specific levels. The level of diversity of invertebrate taxa shows slight signs of alteration from type-specific levels.</p>	<p>Major taxonomic groups of the type-specific community are absent. The ratio of disturbance-sensitive taxa to insensitive taxa, and the level of diversity, are substantially lower than the type-specific level and significantly lower than for good status.</p>
Fish fauna	<p>Species composition and abundance correspond totally or nearly totally to undisturbed conditions. All the type-specific disturbance-sensitive species are present. The age structures of the fish communities show little sign of anthropogenic disturbance and are not indicative of a failure in the reproduction or development of any particular species.</p>	<p>There are slight changes in species composition and abundance from the type-specific communities attributable to anthropogenic impacts on physico-chemical and hydromorphological quality elements. The age structures of the fish communities show signs of disturbance attributable to anthropogenic impacts on physico-chemical or hydromorphological quality elements, and, in a few instances, are indicative of a failure in the reproduction or development of a particular species, to the extent that some age classes may be missing.</p>	<p>The composition and abundance of fish species differ moderately from the type-specific communities attributable to anthropogenic impacts on physico-chemical or hydromorphological quality elements. The age structure of the fish communities shows major signs of anthropogenic disturbance, to the extent that a moderate proportion of the type specific species are absent or of very low abundance.</p>

#### HYDROMORPHOLOGICAL QUALITY ELEMENTS

Element	High status	Good status	Moderate status
Hydrological regime	The quantity and dynamics of flow, and the resultant	Conditions consistent with the achievement of the values	Conditions consistent with the achievement of the values

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	connection to groundwaters, reflect totally, or nearly totally, undisturbed conditions.	specified above for the biological quality elements.	specified above for the biological quality elements.
River continuity	The continuity of the river is not disturbed by anthropogenic activities and allows undisturbed migration of aquatic organisms and sediment transport.	Conditions consistent with the achievement of the values specified above for the biological quality elements.	Conditions consistent with the achievement of the values specified above for the biological quality elements.
Morphological conditions	Channel patterns, width and depth variations, flow velocities, substrate conditions and both the structure and condition of the riparian zones correspond totally or nearly totally to undisturbed conditions.	Conditions consistent with the achievement of the values specified above for the biological quality elements.	Conditions consistent with the achievement of the values specified above for the biological quality elements.

#### PHYSICO-CHEMICAL QUALITY ELEMENTS<sup>0</sup>

Element	High status	Good status	Moderate status
General conditions	The values of the physico-chemical elements correspond totally or nearly totally to undisturbed conditions. Nutrient concentrations remain within the range normally associated with undisturbed conditions. Levels of salinity, pH, oxygen balance, acid neutralising capacity and temperature do not show signs of anthropogenic	Temperature, oxygen balance, pH, acid neutralising capacity and salinity do not reach levels outside the range established so as to ensure the functioning of the type specific ecosystem and the achievement of the values specified above for the biological quality elements. Nutrient concentrations do not exceed the levels established	Conditions consistent with the achievement of the values specified above for the biological quality elements.

**a** The following abbreviations are used: bgl = background level, EQS = environmental quality standard.

**b** Application of the standards derived under this protocol shall not require reduction of pollutant concentrations below background levels: (EQS >bgl).

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	disturbance and remain within the range normally associated with undisturbed conditions.	so as to ensure the functioning of the ecosystem and the achievement of the values specified above for the biological quality elements.	
Specific synthetic pollutants	Concentrations close to zero and at least below the limits of detection of the most advanced analytical techniques in general use.	Concentrations not in excess of the standards set in accordance with the procedure detailed in section 1.2.6 without prejudice to Directive 91/414/EC and Directive 98/8/EC. (<EQS)	Conditions consistent with the achievement of the values specified above for the biological quality elements.
Specific non-synthetic pollutants	Concentrations remain within the range normally associated with undisturbed conditions (background levels = bgl).	Concentrations not in excess of the standards set in accordance with the procedure detailed in section 1.2.6 <sup>b</sup> without prejudice to Directive 91/414/EC and Directive 98/8/EC. (<EQS)	Conditions consistent with the achievement of the values specified above for the biological quality elements.

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**b** Application of the standards derived under this protocol shall not require reduction of pollutant concentrations below background levels: (EQS >bgl).

### 1.2.2. Definitions for high, good and moderate ecological status in lakes

#### BIOLOGICAL QUALITY ELEMENTS

Element	High status	Good status	Moderate status
Phytoplankton	The taxonomic composition and abundance of phytoplankton correspond totally or nearly totally to undisturbed conditions. The average phytoplankton biomass is consistent with the type-specific physico-	There are slight changes in the composition and abundance of planktonic taxa compared to the type-specific communities. Such changes do not indicate any accelerated growth of algae resulting in undesirable disturbance to the	The composition and abundance of planktonic taxa differ moderately from the type-specific communities. Biomass is moderately disturbed and may be such as to produce a significant undesirable disturbance in the condition of other

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	<p>chemical conditions and is not such as to significantly alter the type-specific transparency conditions. Planktonic blooms occur at a frequency and intensity which is consistent with the type specific physico-chemical conditions.</p>	<p>balance of organisms present in the water body or to the physico-chemical quality of the water or sediment. A slight increase in the frequency and intensity of the type specific planktonic blooms may occur.</p>	<p>biological quality elements and the physico-chemical quality of the water or sediment. A moderate increase in the frequency and intensity of planktonic blooms may occur. Persistent blooms may occur during summer months.</p>
Macrophytes and phytobenthos	<p>The taxonomic composition corresponds totally or nearly totally to undisturbed conditions. There are no detectable changes in the average macrophytic and the average phytobenthic abundance.</p>	<p>There are slight changes in the composition and abundance of macrophytic and phytobenthic taxa compared to the type-specific communities. Such changes do not indicate any accelerated growth of phytobenthos or higher forms of plant life resulting in undesirable disturbance to the balance of organisms present in the water body or to the physico-chemical quality of the water. The phytobenthic community is not adversely affected by bacterial tufts and coats present due to anthropogenic activity.</p>	<p>The composition of macrophytic and phytobenthic taxa differ moderately from the type-specific communities and are significantly more distorted than those observed at good quality. Moderate changes in the average macrophytic and the average phytobenthic abundance are evident. The phytobenthic community may be interfered with, and, in some areas, displaced by bacterial tufts and coats present as a result of anthropogenic activities.</p>
Benthic invertebrate fauna	<p>The taxonomic composition and abundance correspond totally or nearly totally to the undisturbed conditions. The ratio of disturbance sensitive taxa to insensitive taxa shows no signs</p>	<p>There are slight changes in the composition and abundance of invertebrate taxa compared to the type-specific communities. The ratio of disturbance sensitive taxa to insensitive taxa shows slight</p>	<p>The composition and abundance of invertebrate taxa differ moderately from the type-specific conditions. Major taxonomic groups of the type-specific community are absent.</p>

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	of alteration from undisturbed levels. The level of diversity of invertebrate taxa shows no sign of alteration from undisturbed levels.	signs of alteration from type-specific levels. The level of diversity of invertebrate taxa shows slight signs of alteration from type-specific levels.	The ratio of disturbance sensitive to insensitive taxa, and the level of diversity, are substantially lower than the type-specific level and significantly lower than for good status.
Fish fauna	Species composition and abundance correspond totally or nearly totally to undisturbed conditions. All the type-specific sensitive species are present. The age structures of the fish communities show little sign of anthropogenic disturbance and are not indicative of a failure in the reproduction or development of a particular species.	There are slight changes in species composition and abundance from the type-specific communities attributable to anthropogenic impacts on physico-chemical or hydromorphological quality elements. The age structures of the fish communities show signs of disturbance attributable to anthropogenic impacts on physico-chemical or hydromorphological quality elements, and, in a few instances, are indicative of a failure in the reproduction or development of a particular species, to the extent that some age classes may be missing.	The composition and abundance of fish species differ moderately from the type-specific communities attributable to anthropogenic impacts on physico-chemical or hydromorphological quality elements. The age structure of the fish communities shows major signs of disturbance, attributable to anthropogenic impacts on physico-chemical or hydromorphological quality elements, to the extent that a moderate proportion of the type specific species are absent or of very low abundance.

#### HYDROMORPHOLOGICAL QUALITY ELEMENTS

Element	High status	Good status	Moderate status
Hydrological regime	The quantity and dynamics of flow, level, residence time, and the resultant connection to groundwaters, reflect totally or nearly	Conditions consistent with the achievement of the values specified above for the biological quality elements.	Conditions consistent with the achievement of the values specified above for the biological quality elements.

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	totally undisturbed conditions.		
Morphological conditions	Lake depth variation, quantity and structure of the substrate, and both the structure and condition of the lake shore zone correspond totally or nearly totally to undisturbed conditions.	Conditions consistent with the achievement of the values specified above for the biological quality elements.	Conditions consistent with the achievement of the values specified above for the biological quality elements.

#### PHYSICO-CHEMICAL QUALITY ELEMENTS<sup>0</sup>

Element	High status	Good status	Moderate status
General conditions	The values of physico-chemical elements correspond totally or nearly totally to undisturbed conditions. Nutrient concentrations remain within the range normally associated with undisturbed conditions. Levels of salinity, pH, oxygen balance, acid neutralising capacity, transparency and temperature do not show signs of anthropogenic disturbance and remain within the range normally associated with undisturbed conditions.	Temperature, oxygen balance, pH, acid neutralising capacity, transparency and salinity do not reach levels outside the range established so as to ensure the functioning of the ecosystem and the achievement of the values specified above for the biological quality elements. Nutrient concentrations do not exceed the levels established so as to ensure the functioning of the ecosystem and the achievement of the values specified above for the biological quality elements.	Conditions consistent with the achievement of the values specified above for the biological quality elements.
Specific synthetic pollutants	Concentrations close to zero and at least below the limits of detection of the most advanced analytical	Concentrations not in excess of the standards set in accordance with the procedure detailed	Conditions consistent with the achievement of the values specified above for

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	techniques in general use.	in section 1.2.6 without prejudice to Directive 91/414/EC and Directive 98/8/EC. (<EQS)	the biological quality elements.
Specific non-synthetic pollutants	Concentrations remain within the range normally associated with undisturbed conditions (background levels = bgl).	Concentrations not in excess of the standards set in accordance with the procedure detailed in section 1.2.6 <sup>b</sup> without prejudice to Directive 91/414/EC and Directive 98/8/EC. (<EQS)	Conditions consistent with the achievement of the values specified above for the biological quality elements.

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**b** Application of the standards derived under this protocol shall not require reduction of pollutant concentrations below background levels: (EQS >bgl).

### 1.2.3. Definitions for high, good and moderate ecological status in transitional waters

#### BIOLOGICAL QUALITY ELEMENTS

Element	High status	Good status	Moderate status
Phytoplankton	The composition and abundance of the phytoplanktonic taxa are consistent with undisturbed conditions. The average phytoplankton biomass is consistent with the type-specific physico-chemical conditions and is not such as to significantly alter the type-specific transparency conditions. Planktonic blooms occur at a frequency and intensity which is consistent with the type specific physico-chemical conditions.	There are slight changes in the composition and abundance of phytoplanktonic taxa. There are slight changes in biomass compared to the type-specific conditions. Such changes do not indicate any accelerated growth of algae resulting in undesirable disturbance to the balance of organisms present in the water body or to the physico-chemical quality of the water. A slight increase in the frequency and intensity of the type specific planktonic blooms may occur.	The composition and abundance of phytoplanktonic taxa differ moderately from type-specific conditions. Biomass is moderately disturbed and may be such as to produce a significant undesirable disturbance in the condition of other biological quality elements. A moderate increase in the frequency and intensity of planktonic blooms may occur. Persistent blooms may occur during summer months.

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Macroalgae	<p>The composition of macroalgal taxa is consistent with undisturbed conditions. There are no detectable changes in macroalgal cover due to anthropogenic activities.</p>	<p>There are slight changes in the composition and abundance of macroalgal taxa compared to the type-specific communities. Such changes do not indicate any accelerated growth of phytobenthos or higher forms of plant life resulting in undesirable disturbance to the balance of organisms present in the water body or to the physico-chemical quality of the water.</p>	<p>The composition of macroalgal taxa differs moderately from type-specific conditions and is significantly more distorted than at good quality. Moderate changes in the average macroalgal abundance are evident and may be such as to result in an undesirable disturbance to the balance of organisms present in the water body.</p>
Angiosperms	<p>The taxonomic composition corresponds totally or nearly totally to undisturbed conditions. There are no detectable changes in angiosperm abundance due to anthropogenic activities.</p>	<p>There are slight changes in the composition of angiosperm taxa compared to the type-specific communities. Angiosperm abundance shows slight signs of disturbance.</p>	<p>The composition of the angiosperm taxa differs moderately from the type-specific communities and is significantly more distorted than at good quality. There are moderate distortions in the abundance of angiosperm taxa.</p>
Benthic invertebrate fauna	<p>The level of diversity and abundance of invertebrate taxa is within the range normally associated with undisturbed conditions. All the disturbance-sensitive taxa associated with undisturbed conditions are present.</p>	<p>The level of diversity and abundance of invertebrate taxa is slightly outside the range associated with the type-specific conditions. Most of the sensitive taxa of the type-specific communities are present.</p>	<p>The level of diversity and abundance of invertebrate taxa is moderately outside the range associated with the type-specific conditions. Taxa indicative of pollution are present. Many of the sensitive taxa of the type-specific communities are absent.</p>
Fish fauna	<p>Species composition and abundance is consistent with undisturbed conditions.</p>	<p>The abundance of the disturbance-sensitive species shows slight signs of distortion from type-specific conditions</p>	<p>A moderate proportion of the type-specific disturbance-sensitive species are absent as a result</p>



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	attributable to anthropogenic impacts on physico-chemical or hydromorphological quality elements.	of anthropogenic impacts on physicochemical or hydromorphological quality elements.
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### HYDROMORPHOLOGICAL QUALITY ELEMENTS

Element	High status	Good status	Moderate status
Tidal regime	The freshwater flow regime corresponds totally or nearly totally to undisturbed conditions.	Conditions consistent with the achievement of the values specified above for the biological quality elements.	Conditions consistent with the achievement of the values specified above for the biological quality elements.
Morphological conditions	Depth variations, substrate conditions, and both the structure and condition of the intertidal zones correspond totally or nearly totally to undisturbed conditions.	Conditions consistent with the achievement of the values specified above for the biological quality elements.	Conditions consistent with the achievement of the values specified above for the biological quality elements.

### PHYSICO-CHEMICAL QUALITY ELEMENTS<sup>0</sup>

Element	High status	Good status	Moderate status
General conditions	Physico-chemical elements correspond totally or nearly totally to undisturbed conditions. Nutrient concentrations remain within the range normally associated with undisturbed conditions. Temperature, oxygen balance and transparency do not show signs of anthropogenic disturbance and	Temperature, oxygenation conditions and transparency do not reach levels outside the ranges established so as to ensure the functioning of the ecosystem and the achievement of the values specified above for the biological quality elements. Nutrient concentrations do not exceed the levels established	Conditions consistent with the achievement of the values specified above for the biological quality elements.

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	remain within the range normally associated with undisturbed conditions.	so as to ensure the functioning of the ecosystem and the achievement of the values specified above for the biological quality elements.	
Specific synthetic pollutants	Concentrations close to zero and at least below the limits of detection of the most advanced analytical techniques in general use.	Concentrations not in excess of the standards set in accordance with the procedure detailed in section 1.2.6 without prejudice to Directive 91/414/EC and Directive 98/8/EC. (<EQS)	Conditions consistent with the achievement of the values specified above for the biological quality elements.
Specific non-synthetic pollutants	Concentrations remain within the range normally associated with undisturbed conditions (background levels = bgl).	Concentrations not in excess of the standards set in accordance with the procedure detailed in section 1.2.6 <sup>b</sup> without prejudice to Directive 91/414/EC and Directive 98/8/EC. (<EQS)	Conditions consistent with the achievement of the values specified above for the biological quality elements.

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**b** Application of the standards derived under this protocol shall not require reduction of pollutant concentrations below background levels: (EQS >bgl).

#### 1.2.4. Definitions for high, good and moderate ecological status in coastal waters

##### BIOLOGICAL QUALITY ELEMENTS

Element	High status	Good status	Moderate status
Phytoplankton	The composition and abundance of phytoplanktonic taxa are consistent with undisturbed conditions. The average phytoplankton biomass is consistent with the type-specific physico-chemical conditions and is not such as	The composition and abundance of phytoplanktonic taxa show slight signs of disturbance. There are slight changes in biomass compared to type-specific conditions. Such changes do not indicate any accelerated growth of algae resulting	The composition and abundance of planktonic taxa show signs of moderate disturbance. Algal biomass is substantially outside the range associated with type-specific conditions, and is such as to impact upon other biological quality elements.

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	to significantly alter the type-specific transparency conditions. Planktonic blooms occur at a frequency and intensity which is consistent with the type specific physico-chemical conditions.	in undesirable disturbance to the balance of organisms present in the water body or to the quality of the water. A slight increase in the frequency and intensity of the type-specific planktonic blooms may occur.	A moderate increase in the frequency and intensity of planktonic blooms may occur. Persistent blooms may occur during summer months.
Macroalgae and angiosperms	All disturbance-sensitive macroalgal and angiosperm taxa associated with undisturbed conditions are present. The levels of macroalgal cover and angiosperm abundance are consistent with undisturbed conditions.	Most disturbance-sensitive macroalgal and angiosperm taxa associated with undisturbed conditions are present. The level of macroalgal cover and angiosperm abundance show slight signs of disturbance.	A moderate number of the disturbance-sensitive macroalgal and angiosperm taxa associated with undisturbed conditions are absent. Macroalgal cover and angiosperm abundance is moderately disturbed and may be such as to result in an undesirable disturbance to the balance of organisms present in the water body.
Benthic invertebrate fauna	The level of diversity and abundance of invertebrate taxa is within the range normally associated with undisturbed conditions. All the disturbance-sensitive taxa associated with undisturbed conditions are present.	The level of diversity and abundance of invertebrate taxa is slightly outside the range associated with the type-specific conditions. Most of the sensitive taxa of the type-specific communities are present.	The level of diversity and abundance of invertebrate taxa is moderately outside the range associated with the type-specific conditions. Taxa indicative of pollution are present. Many of the sensitive taxa of the type-specific communities are absent.

#### HYDROMORPHOLOGICAL QUALITY ELEMENTS

Element	High status	Good status	Moderate status
Tidal regime	The freshwater flow regime and the direction and speed of dominant currents correspond	Conditions consistent with the achievement of the values specified above for	Conditions consistent with the achievement of the values specified above for

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	totally or nearly totally to undisturbed conditions.	the biological quality elements.	the biological quality elements.
Morphological conditions	The depth variation, structure and substrate of the coastal bed, and both the structure and condition of the inter-tidal zones correspond totally or nearly totally to the undisturbed conditions.	Conditions consistent with the achievement of the values specified above for the biological quality elements.	Conditions consistent with the achievement of the values specified above for the biological quality elements.

#### PHYSICO-CHEMICAL QUALITY ELEMENTS<sup>0</sup>

Element	High status	Good status	Moderate status
General conditions	The physico-chemical elements correspond totally or nearly totally to undisturbed conditions. Nutrient concentrations remain within the range normally associated with undisturbed conditions. Temperature, oxygen balance and transparency do not show signs of anthropogenic disturbance and remain within the ranges normally associated with undisturbed conditions.	Temperature, oxygenation conditions and transparency do not reach levels outside the ranges established so as to ensure the functioning of the ecosystem and the achievement of the values specified above for the biological quality elements. Nutrient concentrations do not exceed the levels established so as to ensure the functioning of the ecosystem and the achievement of the values specified above for the biological quality elements.	Conditions consistent with the achievement of the values specified above for the biological quality elements.
Specific synthetic pollutants	Concentrations close to zero and at least below the limits of detection of the most	Concentrations not in excess of the standards set in accordance with the	Conditions consistent with the achievement of the values specified above for

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	advanced analytical techniques in general use.	procedure detailed in section 1.2.6 without prejudice to Directive 91/414/EC and Directive 98/8/EC. (<EQS)	the biological quality elements.
Specific non-synthetic pollutants	Concentrations remain within the range normally associated with undisturbed conditions (background levels = bgl).	Concentrations not in excess of the standards set in accordance with the procedure detailed in section 1.2.6 <sup>b</sup> without prejudice to Directive 91/414/EC and Directive 98/8/EC. (<EQS)	Conditions consistent with the achievement of the values specified above for the biological quality elements.

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**b** Application of the standards derived under this protocol shall not require reduction of pollutant concentrations below background levels: (EQS >bgl).

#### 1.2.5. Definitions for maximum, good and moderate ecological potential for heavily modified or artificial water bodies

<b>Element</b>	<b>Maximum ecological potential</b>	<b>Good ecological potential</b>	<b>Moderate ecological potential</b>
Biological quality elements	The values of the relevant biological quality elements reflect, as far as possible, those associated with the closest comparable surface water body type, given the physical conditions which result from the artificial or heavily modified characteristics of the water body.	There are slight changes in the values of the relevant biological quality elements as compared to the values found at maximum ecological potential.	There are moderate changes in the values of the relevant biological quality elements as compared to the values found at maximum ecological potential. These values are significantly more distorted than those found under good quality.
Hydromorphological elements	The hydromorphological conditions are consistent with the only impacts on the surface water body being those resulting from the artificial	Conditions consistent with the achievement of the values specified above for the biological quality elements.	Conditions consistent with the achievement of the values specified above for the biological quality elements.

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	or heavily modified characteristics of the water body once all mitigation measures have been taken to ensure the best approximation to ecological continuum, in particular with respect to migration of fauna and appropriate spawning and breeding grounds.		
Physico-chemical elements			
General conditions	<p>Physico-chemical elements correspond totally or nearly totally to the undisturbed conditions associated with the surface water body type most closely comparable to the artificial or heavily modified body concerned. Nutrient concentrations remain within the range normally associated with such undisturbed conditions. The levels of temperature, oxygen balance and pH are consistent with the those found in the most closely comparable surface water body types under undisturbed conditions.</p>	<p>The values for physico-chemical elements are within the ranges established so as to ensure the functioning of the ecosystem and the achievement of the values specified above for the biological quality elements. Temperature and pH do not reach levels outside the ranges established so as to ensure the functioning of the ecosystem and the achievement of the values specified above for the biological quality elements. Nutrient concentrations do not exceed the levels established so as to ensure the functioning of the ecosystem and the achievement of the values specified</p>	<p>Conditions consistent with the achievement of the values specified above for the biological quality elements.</p>

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		above for the biological quality elements.	
Specific synthetic pollutants	Concentrations close to zero and at least below the limits of detection of the most advanced analytical techniques in general use.	Concentrations not in excess of the standards set in accordance with the procedure detailed in section 1.2.6 without prejudice to Directive 91/414/EC and Directive 98/8/EC. (<EQS)	Conditions consistent with the achievement of the values specified above for the biological quality elements.
Specific non-synthetic pollutants	Concentrations remain within the range normally associated with the undisturbed conditions found in the surface water body type most closely comparable to the artificial or heavily modified body concerned (background levels = bgl).	Concentrations not in excess of the standards set in accordance with the procedure detailed in section 1.2.6 <sup>a</sup> without prejudice to Directive 91/414/EC and Directive 98/8/EC. (<EQS)	Conditions consistent with the achievement of the values specified above for the biological quality elements.
<p><b>a</b> Application of the standards derived under this protocol shall not require reduction of pollutant concentrations below background levels.</p>			

### 1.2.6. Procedure for the setting of chemical quality standards by Member States

In deriving environmental quality standards for pollutants listed in points 1 to 9 of Annex VIII for the protection of aquatic biota, Member States shall act in accordance with the following provisions. Standards may be set for water, sediment or biota.

Where possible, both acute and chronic data shall be obtained for the taxa set out below which are relevant for the water body type concerned as well as any other aquatic taxa for which data are available. The 'base set' of taxa are:

- algae and/or macrophytes
- daphnia or representative organisms for saline waters
- fish.

#### Setting the environmental quality standard

The following procedure applies to the setting of a maximum annual average concentration:

- (i) Member States shall set appropriate safety factors in each case consistent with the nature and quality of the available data and the guidance given in section 3.3.1 of Part II of

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‘Technical guidance document in support of Commission Directive 93/67/EEC on risk assessment for new notified substances and Commission Regulation (EC) No 1488/94 on risk assessment for existing substances’

and the safety factors set out in the table below:

	<b>Safety factor</b>
<b>At least one acute L(E)C<sub>50</sub> from each of three trophic levels of the base set</b>	1 000
<b>One chronic NOEC (either fish or daphnia or a representative organism for saline waters)</b>	100
<b>Two chronic NOECs from species representing two trophic levels (fish and/or daphnia or a representative organism for saline waters and/or algae)</b>	50
<b>Chronic NOECs from at least three species (normally fish, daphnia or a representative organism for saline waters and algae) representing three trophic levels</b>	10
<b>Other cases, including field data or model ecosystems, which allow more precise safety factors to be calculated and applied</b>	Case-by-case assessment

- (ii) where data on persistence and bioaccumulation are available, these shall be taken into account in deriving the final value of the environmental quality standard;
- (iii) the standard thus derived should be compared with any evidence from field studies. Where anomalies appear, the derivation shall be reviewed to allow a more precise safety factor to be calculated;
- (iv) the standard derived shall be subject to peer review and public consultation including to allow a more precise safety factor to be calculated.

### 1.3. Monitoring of ecological status and chemical status for surface waters

The surface water monitoring network shall be established in accordance with the requirements of Article 8. The monitoring network shall be designed so as to provide a coherent and comprehensive overview of ecological and chemical status within each river basin and shall permit classification of water bodies into five classes consistent with the normative definitions in section 1.2. Member States shall provide a map or maps showing the surface water monitoring network in the river basin management plan.

On the basis of the characterisation and impact assessment carried out in accordance with Article 5 and Annex II, Member States shall for each period to which a river basin management plan applies, establish a surveillance monitoring programme and an operational monitoring programme. Member States may also need in some cases to establish programmes of investigative monitoring.

Member States shall monitor parameters which are indicative of the status of each relevant quality element. In selecting parameters for biological quality elements Member States shall



identify the appropriate taxonomic level required to achieve adequate confidence and precision in the classification of the quality elements. Estimates of the level of confidence and precision of the results provided by the monitoring programmes shall be given in the plan.

### 1.3.1. Design of surveillance monitoring

#### Objective

Member States shall establish surveillance monitoring programmes to provide information for:

- supplementing and validating the impact assessment procedure detailed in Annex II,
- the efficient and effective design of future monitoring programmes,
- the assessment of long-term changes in natural conditions, and
- the assessment of long-term changes resulting from widespread anthropogenic activity.

The results of such monitoring shall be reviewed and used, in combination with the impact assessment procedure described in Annex II, to determine requirements for monitoring programmes in the current and subsequent river basin management plans.

#### Selection of monitoring points

Surveillance monitoring shall be carried out of sufficient surface water bodies to provide an assessment of the overall surface water status within each catchment or subcatchments within the river basin district. In selecting these bodies Member States shall ensure that, where appropriate, monitoring is carried out at points where:

- the rate of water flow is significant within the river basin district as a whole; including points on large rivers where the catchment area is greater than 2 500 km<sup>2</sup>,
- the volume of water present is significant within the river basin district, including large lakes and reservoirs,
- significant bodies of water cross a Member State boundary,
- sites are identified under the Information Exchange Decision 77/795/EEC, and

at such other sites as are required to estimate the pollutant load which is transferred across Member State boundaries, and which is transferred into the marine environment.

#### Selection of quality elements

Surveillance monitoring shall be carried out for each monitoring site for a period of one year during the period covered by a river basin management plan for:

- parameters indicative of all biological quality elements,
- parameters indicative of all hydromorphological quality elements,
- parameters indicative of all general physico-chemical quality elements,
- priority list pollutants which are discharged into the river basin or sub-basin, and
- other pollutants discharged in significant quantities in the river basin or sub-basin,

unless the previous surveillance monitoring exercise showed that the body concerned reached good status and there is no evidence from the review of impact of human activity in Annex II that the impacts on the body have changed. In these cases, surveillance monitoring shall be carried out once every three river basin management plans.

### 1.3.2. Design of operational monitoring

Operational monitoring shall be undertaken in order to:

- establish the status of those bodies identified as being at risk of failing to meet their environmental objectives, and

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- assess any changes in the status of such bodies resulting from the programmes of measures.

The programme may be amended during the period of the river basin management plan in the light of information obtained as part of the requirements of Annex II or as part of this Annex, in particular to allow a reduction in frequency where an impact is found not to be significant or the relevant pressure is removed.

#### Selection of monitoring sites

Operational monitoring shall be carried out for all those bodies of water which on the basis of either the impact assessment carried out in accordance with Annex II or surveillance monitoring are identified as being at risk of failing to meet their environmental objectives under Article 4 and for those bodies of water into which priority list substances are discharged. Monitoring points shall be selected for priority list substances as specified in the legislation laying down the relevant environmental quality standard. In all other cases, including for priority list substances where no specific guidance is given in such legislation, monitoring points shall be selected as follows:

- for bodies at risk from significant point source pressures, sufficient monitoring points within each body in order to assess the magnitude and impact of the point source. Where a body is subject to a number of point source pressures monitoring points may be selected to assess the magnitude and impact of these pressures as a whole,
- for bodies at risk from significant diffuse source pressures, sufficient monitoring points within a selection of the bodies in order to assess the magnitude and impact of the diffuse source pressures. The selection of bodies shall be made such that they are representative of the relative risks of the occurrence of the diffuse source pressures, and of the relative risks of the failure to achieve good surface water status,
- for bodies at risk from significant hydromorphological pressure, sufficient monitoring points within a selection of the bodies in order to assess the magnitude and impact of the hydromorphological pressures. The selection of bodies shall be indicative of the overall impact of the hydromorphological pressure to which all the bodies are subject.

#### Selection of quality elements

In order to assess the magnitude of the pressure to which bodies of surface water are subject Member States shall monitor for those quality elements which are indicative of the pressures to which the body or bodies are subject. In order to assess the impact of these pressures, Member States shall monitor as relevant:

- parameters indicative of the biological quality element, or elements, most sensitive to the pressures to which the water bodies are subject,
- all priority substances discharged, and other pollutants discharged in significant quantities,
- parameters indicative of the hydromorphological quality element most sensitive to the pressure identified.

#### 1.3.3. Design of investigative monitoring

##### Objective

Investigative monitoring shall be carried out:

- where the reason for any exceedances is unknown,
- where surveillance monitoring indicates that the objectives set out in Article 4 for a body of water are not likely to be achieved and operational monitoring has not already been established, in order to ascertain the causes of a water body or water bodies failing to achieve the environmental objectives, or
- to ascertain the magnitude and impacts of accidental pollution,

and shall inform the establishment of a programme of measures for the achievement of the environmental objectives and specific measures necessary to remedy the effects of accidental pollution.

#### 1.3.4. Frequency of monitoring

For the surveillance monitoring period, the frequencies for monitoring parameters indicative of physico-chemical quality elements given below should be applied unless greater intervals would be justified on the basis of technical knowledge and expert judgement. For biological or hydromorphological quality elements monitoring shall be carried out at least once during the surveillance monitoring period.

For operational monitoring, the frequency of monitoring required for any parameter shall be determined by Member States so as to provide sufficient data for a reliable assessment of the status of the relevant quality element. As a guideline, monitoring should take place at intervals not exceeding those shown in the table below unless greater intervals would be justified on the basis of technical knowledge and expert judgement.

Frequencies shall be chosen so as to achieve an acceptable level of confidence and precision. Estimates of the confidence and precision attained by the monitoring system used shall be stated in the river basin management plan.

Monitoring frequencies shall be selected which take account of the variability in parameters resulting from both natural and anthropogenic conditions. The times at which monitoring is undertaken shall be selected so as to minimise the impact of seasonal variation on the results, and thus ensure that the results reflect changes in the water body as a result of changes due to anthropogenic pressure. Additional monitoring during different seasons of the same year shall be carried out, where necessary, to achieve this objective.

Quality element	Rivers	Lakes	Transitional	Coastal
<b>Biological</b>				
Phytoplankton	6 months	6 months	6 months	6 months
Other aquatic flora	3 years	3 years	3 years	3 years
Macro invertebrates	3 years	3 years	3 years	3 years
Fish	3 years	3 years	3 years	
<b>Hydromorphological</b>				
Continuity	6 years			
Hydrology	continuous	1 month		
Morphology	6 years	6 years	6 years	6 years
<b>Physico-chemical</b>				
Thermal conditions	3 months	3 months	3 months	3 months
Oxygenation	3 months	3 months	3 months	3 months
Salinity	3 months	3 months	3 months	
Nutrient status	3 months	3 months	3 months	3 months

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Acidification status	3 months	3 months		
Other pollutants	3 months	3 months	3 months	3 months
Priority substances	1 month	1 month	1 month	1 month

### 1.3.5. Additional monitoring requirements for protected areas

The monitoring programmes required above shall be supplemented in order to fulfil the following requirements:

#### Drinking water abstraction points

Bodies of surface water designated in Article 7 which provide more than 100 m<sup>3</sup> a day as an average shall be designated as monitoring sites and shall be subject to such additional monitoring as may be necessary to meet the requirements of that Article. Such bodies shall be monitored for all priority substances discharged and all other substances discharged in significant quantities which could affect the status of the body of water and which are controlled under the provisions of the Drinking Water Directive. Monitoring shall be carried out in accordance with the frequencies set out below:

Community served	Frequency
<10 000	4 per year
10 000 to 30 000	8 per year
>30 000	12 per year.

#### Habitat and species protection areas

Bodies of water forming these areas shall be included within the operational monitoring programme referred to above where, on the basis of the impact assessment and the surveillance monitoring, they are identified as being at risk of failing to meet their environmental objectives under Article 4. Monitoring shall be carried out to assess the magnitude and impact of all relevant significant pressures on these bodies and, where necessary, to assess changes in the status of such bodies resulting from the programmes of measures. Monitoring shall continue until the areas satisfy the water-related requirements of the legislation under which they are designated and meet their objectives under Article 4.

### 1.3.6. Standards for monitoring of quality elements

Methods used for the monitoring of type parameters shall conform to the international standards listed below or such other national or international standards which will ensure the provision of data of an equivalent scientific quality and comparability.

#### Macroinvertebrate sampling

ISO 5667-3:1995	Water quality — Sampling — Part 3: Guidance on the preservation and handling of samples
EN 27828:1994	Water quality — Methods for biological sampling — Guidance on hand net sampling of benthic macroinvertebrates

EN 28265:1994	Water quality — Methods of biological sampling — Guidance on the design and use of quantitative samplers for benthic macroinvertebrates on stony substrata in shallow waters
EN ISO 9391:1995	Water quality — Sampling in deep waters for macroinvertebrates — Guidance on the use of colonisation, qualitative and quantitative samplers
EN ISO 8689-1:1999	Biological classification of rivers PART I: Guidance on the interpretation of biological quality data from surveys of benthic macroinvertebrates in running waters
EN ISO 8689-2:1999	Biological classification of rivers PART II: Guidance on the presentation of biological quality data from surveys of benthic macroinvertebrates in running waters

#### Macrophyte sampling

Relevant CEN / ISO standards when developed

Fish sampling

Relevant CEN / ISO standards when developed

Diatom sampling

Relevant CEN/ISO standards when developed

Standards for physico-chemical parameters

Any relevant CEN/ISO standards

Standards for hydromorphological parameters

Any relevant CEN/ISO standards

#### 1.4. Classification and presentation of ecological status

##### 1.4.1. Comparability of biological monitoring results

- (i) Member States shall establish monitoring systems for the purpose of estimating the values of the biological quality elements specified for each surface water category or for heavily modified and artificial bodies of surface water. In applying the procedure set out below to heavily modified or artificial water bodies, references to ecological status should be construed as references to ecological potential. Such systems may utilise particular species or groups of species which are representative of the quality element as a whole.
- (ii) In order to ensure comparability of such monitoring systems, the results of the systems operated by each Member State shall be expressed as ecological quality ratios for the purposes of classification of ecological status. These ratios shall represent the relationship between the values of the biological parameters observed for a given body of surface water and the values for these parameters in the reference conditions applicable to that body. The ratio shall be expressed as a numerical value between zero and one, with high ecological status represented by values close to one and bad ecological status by values close to zero.

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- (iii) Each Member State shall divide the ecological quality ratio scale for their monitoring system for each surface water category into five classes ranging from high to bad ecological status, as defined in Section 1.2, by assigning a numerical value to each of the boundaries between the classes. The value for the boundary between the classes of high and good status, and the value for the boundary between good and moderate status shall be established through the intercalibration exercise described below.
- (iv) The Commission shall facilitate this intercalibration exercise in order to ensure that these class boundaries are established consistent with the normative definitions in Section 1.2 and are comparable between Member States.
- (v) As part of this exercise the Commission shall facilitate an exchange of information between Members States leading to the identification of a range of sites in each ecoregion in the Community; these sites will form an intercalibration network. The network shall consist of sites selected from a range of surface water body types present within each ecoregion. For each surface water body type selected, the network shall consist of at least two sites corresponding to the boundary between the normative definitions of high and good status, and at least two sites corresponding to the boundary between the normative definitions of good and moderate status. The sites shall be selected by expert judgement based on joint inspections and all other available information.
- (vi) Each Member State monitoring system shall be applied to those sites in the intercalibration network which are both in the ecoregion and of a surface water body type to which the system will be applied pursuant to the requirements of this Directive. The results of this application shall be used to set the numerical values for the relevant class boundaries in each Member State monitoring system.
- (vii) <sup>[F1]</sup>The Commission shall prepare a draft register of sites to form the intercalibration network. The final register of sites shall be established in accordance with the regulatory procedure referred to in Article 21(2).]
- (viii) The Commission and Member States shall complete the intercalibration exercise within 18 months of the date on which the finalised register is published.
- (ix) <sup>[F1]</sup>The results of the intercalibration exercise and the values established for the Member State monitoring system classifications in accordance with points (i) to (viii) and designed to amend non-essential elements of this Directive by supplementing it, shall be adopted in accordance with the regulatory procedure with scrutiny referred to in Article 21(3) and published within six months of the completion of the intercalibration exercise.]

#### Textual Amendments

- F1** Substituted by [Directive 2008/32/EC of the European Parliament and of the Council of 11 March 2008 amending Directive 2000/60/EC establishing a framework for Community action in the field of water policy, as regards the implementing powers conferred on the Commission.](#)

- 1.4.2. Presentation of monitoring results and classification of ecological status and ecological potential

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- (i) For surface water categories, the ecological status classification for the body of water shall be represented by the lower of the values for the biological and physico-chemical monitoring results for the relevant quality elements classified in accordance with the first column of the table set out below. Member States shall provide a map for each river basin district illustrating the classification of the ecological status for each body of water, colour-coded in accordance with the second column of the table set out below to reflect the ecological status classification of the body of water:

<b>Ecological status classification</b>	<b>Colour code</b>
High	Blue
Good	Green
Moderate	Yellow
Poor	Orange
Bad	Red

- (ii) For heavily modified and artificial water bodies, the ecological potential classification for the body of water shall be represented by the lower of the values for the biological and physico-chemical monitoring results for the relevant quality elements classified in accordance with the first column of the table set out below. Member States shall provide a map for each river basin district illustrating the classification of the ecological potential for each body of water, colour-coded, in respect of artificial water bodies in accordance with the second column of the table set out below, and in respect of heavily modified water bodies in accordance with the third column of that table:

<b>Ecological potential classification</b>	<b>Colour code</b>	
	<b>Artificial Water Bodies</b>	<b>Heavily Modified</b>
Good and above	Equal green and light grey stripes	Equal green and dark grey stripes
Moderate	Equal yellow and light grey stripes	Equal yellow and dark grey stripes
Poor	Equal orange and light grey stripes	Equal orange and dark grey stripes
Bad	Equal red and light grey stripes	Equal red and dark grey stripes

- (iii) Member States shall also indicate, by a black dot on the map, those bodies of water where failure to achieve good status or good ecological potential is due to non-compliance with one or more environmental quality standards which have been established for that body of water in respect of specific synthetic and non-synthetic pollutants (in accordance with the compliance regime established by the Member State).

#### 1.4.3. Presentation of monitoring results and classification of chemical status

Where a body of water achieves compliance with all the environmental quality standards established in Annex IX, Article 16 and under other relevant Community legislation setting environmental quality standards it shall be recorded as achieving good chemical status. If not, the body shall be recorded as failing to achieve good chemical status.

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Member States shall provide a map for each river basin district illustrating chemical status for each body of water, colour-coded in accordance with the second column of the table set out below to reflect the chemical status classification of the body of water:

<b>Chemical status classification</b>	<b>Colour code</b>
Good	Blue
Failing to achieve good	Red

## 2. GROUNDWATER

### 2.1. Groundwater quantitative status

#### 2.1.1. Parameter for the classification of quantitative status

##### *Groundwater level regime*

#### 2.1.2. Definition of quantitative status

<b>Elements</b>	<b>Good status</b>
Groundwater level	<p>The level of groundwater in the groundwater body is such that the available groundwater resource is not exceeded by the long-term annual average rate of abstraction.</p> <p>Accordingly, the level of groundwater is not subject to anthropogenic alterations such as would result in:</p> <ul style="list-style-type: none"> <li>— failure to achieve the environmental objectives specified under Article 4 for associated surface waters,</li> <li>— any significant diminution in the status of such waters,</li> <li>— any significant damage to terrestrial ecosystems which depend directly on the groundwater body,</li> </ul> <p>and alterations to flow direction resulting from level changes may occur temporarily, or continuously in a spatially limited area, but such reversals do not cause saltwater or other intrusion, and do not indicate a sustained and clearly identified anthropogenically induced trend in flow direction likely to result in such intrusions.</p>

### 2.2. Monitoring of groundwater quantitative status

#### 2.2.1. Groundwater level monitoring network

The groundwater monitoring network shall be established in accordance with the requirements of Articles 7 and 8. The monitoring network shall be designed so as to provide a reliable assessment of the quantitative status of all groundwater bodies or groups of bodies including assessment of the available groundwater resource. Member States shall provide a map or maps showing the groundwater monitoring network in the river basin management plan.



### 2.2.2. Density of monitoring sites

The network shall include sufficient representative monitoring points to estimate the groundwater level in each groundwater body or group of bodies taking into account short and long-term variations in recharge and in particular:

- for groundwater bodies identified as being at risk of failing to achieve environmental objectives under Article 4, ensure sufficient density of monitoring points to assess the impact of abstractions and discharges on the groundwater level,
- for groundwater bodies within which groundwater flows across a Member State boundary, ensure sufficient monitoring points are provided to estimate the direction and rate of groundwater flow across the Member State boundary.

### 2.2.3. Monitoring frequency

The frequency of observations shall be sufficient to allow assessment of the quantitative status of each groundwater body or group of bodies taking into account short and long-term variations in recharge. In particular:

- for groundwater bodies identified as being at risk of failing to achieve environmental objectives under Article 4, ensure sufficient frequency of measurement to assess the impact of abstractions and discharges on the groundwater level,
- for groundwater bodies within which groundwater flows across a Member State boundary, ensure sufficient frequency of measurement to estimate the direction and rate of groundwater flow across the Member State boundary.

### 2.2.4. Interpretation and presentation of groundwater quantitative status

The results obtained from the monitoring network for a groundwater body or group of bodies shall be used to assess the quantitative status of that body or those bodies. Subject to point 2.5. Member States shall provide a map of the resulting assessment of groundwater quantitative status, colour-coded in accordance with the following regime:

Good : green  
 Poor : red

## 2.3. Groundwater chemical status

### 2.3.1. Parameters for the determination of groundwater chemical status

Conductivity

Concentrations of pollutants

### 2.3.2. Definition of good groundwater chemical status

Elements	Good status
General	<p>The chemical composition of the groundwater body is such that the concentrations of pollutants:</p> <ul style="list-style-type: none"> <li>— as specified below, do not exhibit the effects of saline or other intrusions</li> <li>— do not exceed the quality standards applicable under other relevant Community legislation in accordance with Article 17</li> </ul>

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	— are not such as would result in failure to achieve the environmental objectives specified under Article 4 for associated surface waters nor any significant diminution of the ecological or chemical quality of such bodies nor in any significant damage to terrestrial ecosystems which depend directly on the groundwater body
Conductivity	Changes in conductivity are not indicative of saline or other intrusion into the groundwater body

## 2.4. Monitoring of groundwater chemical status

### 2.4.1. Groundwater monitoring network

The groundwater monitoring network shall be established in accordance with the requirements of Articles 7 and 8. The monitoring network shall be designed so as to provide a coherent and comprehensive overview of groundwater chemical status within each river basin and to detect the presence of long-term anthropogenically induced upward trends in pollutants.

On the basis of the characterisation and impact assessment carried out in accordance with Article 5 and Annex II, Member States shall for each period to which a river basin management plan applies, establish a surveillance monitoring programme. The results of this programme shall be used to establish an operational monitoring programme to be applied for the remaining period of the plan.

Estimates of the level of confidence and precision of the results provided by the monitoring programmes shall be given in the plan.

### 2.4.2. Surveillance monitoring

#### Objective

Surveillance monitoring shall be carried out in order to:

- supplement and validate the impact assessment procedure,
- provide information for use in the assessment of long term trends both as a result of changes in natural conditions and through anthropogenic activity.

#### Selection of monitoring sites

Sufficient monitoring sites shall be selected for each of the following:

- bodies identified as being at risk following the characterisation exercise undertaken in accordance with Annex II,
- bodies which cross a Member State boundary.

#### Selection of parameters

The following set of core parameters shall be monitored in all the selected groundwater bodies:

- oxygen content
- pH value
- conductivity
- nitrate
- ammonium

Bodies which are identified in accordance with Annex II as being at significant risk of failing to achieve good status shall also be monitored for those parameters which are indicative of the impact of these pressures.

Transboundary water bodies shall also be monitored for those parameters which are relevant for the protection of all of the uses supported by the groundwater flow.

#### 2.4.3. Operational monitoring

##### Objective

Operational monitoring shall be undertaken in the periods between surveillance monitoring programmes in order to:

- establish the chemical status of all groundwater bodies or groups of bodies determined as being at risk,
- establish the presence of any long term anthropogenically induced upward trend in the concentration of any pollutant.

##### Selection of monitoring sites

Operational monitoring shall be carried out for all those groundwater bodies or groups of bodies which on the basis of both the impact assessment carried out in accordance with Annex II and surveillance monitoring are identified as being at risk of failing to meet objectives under Article 4. The selection of monitoring sites shall also reflect an assessment of how representative monitoring data from that site is of the quality of the relevant groundwater body or bodies.

##### Frequency of monitoring

Operational monitoring shall be carried out for the periods between surveillance monitoring programmes at a frequency sufficient to detect the impacts of relevant pressures but at a minimum of once per annum.

#### 2.4.4. Identification of trends in pollutants

Member States shall use data from both surveillance and operational monitoring in the identification of long term anthropogenically induced upward trends in pollutant concentrations and the reversal of such trends. The base year or period from which trend identification is to be calculated shall be identified. The calculation of trends shall be undertaken for a body or, where appropriate, group of bodies of groundwater. Reversal of a trend shall be demonstrated statistically and the level of confidence associated with the identification stated.

#### 2.4.5. Interpretation and presentation of groundwater chemical status

In assessing status, the results of individual monitoring points within a groundwater body shall be aggregated for the body as a whole. Without prejudice to the Directives concerned, for good status to be achieved for a groundwater body, for those chemical parameters for which environmental quality standards have been set in Community legislation:

- the mean value of the results of monitoring at each point in the groundwater body or group of bodies shall be calculated, and
- in accordance with Article 17 these mean values shall be used to demonstrate compliance with good groundwater chemical status.

Subject to point 2.5, Member States shall provide a map of groundwater chemical status, colour-coded as indicated below:

Good	:	green
Poor	:	red

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Member States shall also indicate by a black dot on the map, those groundwater bodies which are subject to a significant and sustained upward trend in the concentrations of any pollutant resulting from the impact of human activity. Reversal of a trend shall be indicated by a blue dot on the map.

These maps shall be included in the river basin management plan.

#### 2.5. Presentation of Groundwater Status

Member States shall provide in the river basin management plan a map showing for each groundwater body or groups of groundwater bodies both the quantitative status and the chemical status of that body or group of bodies, colour-coded in accordance with the requirements of points 2.2.4 and 2.4.5. Member States may choose not to provide separate maps under points 2.2.4 and 2.4.5 but shall in that case also provide an indication in accordance with the requirements of point 2.4.5 on the map required under this point, of those bodies which are subject to a significant and sustained upward trend in the concentration of any pollutant or any reversal in such a trend.

## ANNEX VI

### LISTS OF MEASURES TO BE INCLUDED WITHIN THE PROGRAMMES OF MEASURES

#### PART A

Measures required under the following Directives:

- (i) The Bathing Water Directive (76/160/EEC);
- (ii) The Birds Directive (79/409/EEC)<sup>(7)</sup>;
- (iii) The Drinking Water Directive (80/778/EEC) as amended by Directive (98/83/EC);
- (iv) The Major Accidents (Seveso) Directive (96/82/EC)<sup>(8)</sup>;
- (v) The Environmental Impact Assessment Directive (85/337/EEC)<sup>(9)</sup>;
- (vi) The Sewage Sludge Directive (86/278/EEC)<sup>(10)</sup>;
- (vii) The Urban Waste-water Treatment Directive (91/271/EEC);
- (viii) The Plant Protection Products Directive (91/414/EEC);
- (ix) The Nitrates Directive (91/676/EEC);
- (x) The Habitats Directive (92/43/EEC)<sup>(11)</sup>;
- (xi) The Integrated Pollution Prevention Control Directive (96/61/EC).

## PART B

The following is a non-exclusive list of supplementary measures which Member States within each river basin district may choose to adopt as part of the programme of measures required under Article 11(4):

- (i) legislative instruments
- (ii) administrative instruments
- (iii) economic or fiscal instruments
- (iv) negotiated environmental agreements
- (v) emission controls
- (vi) codes of good practice
- (vii) recreation and restoration of wetlands areas
- (viii) abstraction controls
- (ix) demand management measures, *inter alia*, promotion of adapted agricultural production such as low water requiring crops in areas affected by drought
- (x) efficiency and reuse measures, *inter alia*, promotion of water-efficient technologies in industry and water-saving irrigation techniques
- (xi) construction projects
- (xii) desalination plants
- (xiii) rehabilitation projects
- (xiv) artificial recharge of aquifers
- (xv) educational projects
- (xvi) research, development and demonstration projects
- (xvii) other relevant measures

## ANNEX VII

### RIVER BASIN MANAGEMENT PLANS

#### A.

River basin management plans shall cover the following elements:

1. a general description of the characteristics of the river basin district required under Article 5 and Annex II. This shall include:
  - 1.1. for surface waters:
    - mapping of the location and boundaries of water bodies,
    - mapping of the ecoregions and surface water body types within the river basin,
    - identification of reference conditions for the surface water body types;
  - 1.2. for groundwaters:

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- mapping of the location and boundaries of groundwater bodies;
- 2. a summary of significant pressures and impact of human activity on the status of surface water and groundwater, including:
  - estimation of point source pollution,
  - estimation of diffuse source pollution, including a summary of land use,
  - estimation of pressures on the quantitative status of water including abstractions,
  - analysis of other impacts of human activity on the status of water;
- 3. identification and mapping of protected areas as required by Article 6 and Annex IV;
- 4. a map of the monitoring networks established for the purposes of Article 8 and Annex V, and a presentation in map form of the results of the monitoring programmes carried out under those provisions for the status of:
  - 4.1. surface water (ecological and chemical);
  - 4.2. groundwater (chemical and quantitative);
  - 4.3. protected areas;
- 5. a list of the environmental objectives established under Article 4 for surface waters, groundwaters and protected areas, including in particular identification of instances where use has been made of Article 4(4), (5), (6) and (7), and the associated information required under that Article;
- 6. a summary of the economic analysis of water use as required by Article 5 and Annex III;
- 7. a summary of the programme or programmes of measures adopted under Article 11, including the ways in which the objectives established under Article 4 are thereby to be achieved;
  - 7.1. a summary of the measures required to implement Community legislation for the protection of water;
  - 7.2. a report on the practical steps and measures taken to apply the principle of recovery of the costs of water use in accordance with Article 9;
  - 7.3. a summary of the measures taken to meet the requirements of Article 7;
  - 7.4. a summary of the controls on abstraction and impoundment of water, including reference to the registers and identifications of the cases where exemptions have been made under Article 11(3)(e);
  - 7.5. a summary of the controls adopted for point source discharges and other activities with an impact on the status of water in accordance with the provisions of Article 11(3)(g) and 11(3)(i);
  - 7.6. an identification of the cases where direct discharges to groundwater have been authorised in accordance with the provisions of Article 11(3)(j);
  - 7.7. a summary of the measures taken in accordance with Article 16 on priority substances;
  - 7.8. a summary of the measures taken to prevent or reduce the impact of accidental pollution incidents;

- 7.9. a summary of the measures taken under Article 11(5) for bodies of water which are unlikely to achieve the objectives set out under Article 4;
  - 7.10. details of the supplementary measures identified as necessary in order to meet the environmental objectives established;
  - 7.11. details of the measures taken to avoid increase in pollution of marine waters in accordance with Article 11(6);
  8. a register of any more detailed programmes and management plans for the river basin district dealing with particular sub-basins, sectors, issues or water types, together with a summary of their contents;
  9. a summary of the public information and consultation measures taken, their results and the changes to the plan made as a consequence;
  10. a list of competent authorities in accordance with Annex I;
  11. the contact points and procedures for obtaining the background documentation and information referred to in Article 14(1), and in particular details of the control measures adopted in accordance with Article 11(3)(g) and 11(3)(i) and of the actual monitoring data gathered in accordance with Article 8 and Annex V.
- B. The first update of the river basin management plan and all subsequent updates shall also include:
1. a summary of any changes or updates since the publication of the previous version of the river basin management plan, including a summary of the reviews to be carried out under Article 4(4), (5), (6) and (7);
  2. an assessment of the progress made towards the achievement of the environmental objectives, including presentation of the monitoring results for the period of the previous plan in map form, and an explanation for any environmental objectives which have not been reached;
  3. a summary of, and an explanation for, any measures foreseen in the earlier version of the river basin management plan which have not been undertaken;
  4. a summary of any additional interim measures adopted under Article 11(5) since the publication of the previous version of the river basin management plan.

## ANNEX VIII

### INDICATIVE LIST OF THE MAIN POLLUTANTS

1. Organohalogen compounds and substances which may form such compounds in the aquatic environment.
2. Organophosphorous compounds.
3. Organotin compounds.
4. Substances and preparations, or the breakdown products of such, which have been proved to possess carcinogenic or mutagenic properties or properties which may affect

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- steroidogenic, thyroid, reproduction or other endocrine-related functions in or via the aquatic environment.
5. Persistent hydrocarbons and persistent and bioaccumulable organic toxic substances.
  6. Cyanides.
  7. Metals and their compounds.
  8. Arsenic and its compounds.
  9. Biocides and plant protection products.
  10. Materials in suspension.
  11. Substances which contribute to eutrophication (in particular, nitrates and phosphates).
  12. Substances which have an unfavourable influence on the oxygen balance (and can be measured using parameters such as BOD, COD, etc.).

## ANNEX IX

### EMISSION LIMIT VALUES AND ENVIRONMENTAL QUALITY STANDARDS

The 'limit values' and 'quality objectives' established under the re Directives of Directive 76/464/EEC shall be considered emission limit values and environmental quality standards, respectively, for the purposes of this Directive. They are established in the following Directives:

- (i) The Mercury Discharges Directive (82/176/EEC)<sup>(12)</sup>;
- (ii) The Cadmium Discharges Directive (83/513/EEC)<sup>(13)</sup>;
- (iii) The Mercury Directive (84/156/EEC)<sup>(14)</sup>;
- (iv) The Hexachlorocyclohexane Discharges Directive (84/491/EEC)<sup>(15)</sup>; and
- (v) The Dangerous Substance Discharges Directive (86/280/EEC)<sup>(16)</sup>.

## [<sup>F2</sup>ANNEX X

### Textual Amendments

- F2** Substituted by [Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008 on environmental quality standards in the field of water policy, amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC, 86/280/EEC and amending Directive 2000/60/EC of the European Parliament and of the Council.](#)



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## LIST OF PRIORITY SUBSTANCES IN THE FIELD OF WATER POLICY

Number	CAS number <sup>a</sup>	EU number <sup>b</sup>	Name of priority substance <sup>c</sup>	Identified as priority hazardous substance
(1)	15972-60-8	240-110-8	Alachlor	
(2)	120-12-7	204-371-1	Anthracene	X
(3)	1912-24-9	217-617-8	Atrazine	
(4)	71-43-2	200-753-7	Benzene	
(5)	not applicable	not applicable	Brominated diphenylether <sup>d</sup>	X <sup>e</sup>
	32534-81-9	not applicable	Pentabromodiphenylether (congener numbers 28, 47, 99, 100, 153 and 154)	
(6)	7440-43-9	231-152-8	Cadmium and its compounds	X
(7)	85535-84-8	287-476-5	Chloroalkanes, C <sub>10-13</sub> <sup>d</sup>	X
(8)	470-90-6	207-432-0	Chlorfenvinphos	
(9)	2921-88-2	220-864-4	Chlorpyrifos (Chlorpyrifos-ethyl)	
(10)	107-06-2	203-458-1	1,2-dichloroethane	
(11)	75-09-2	200-838-9	Dichloromethane	
(12)	117-81-7	204-211-0	Di(2-ethylhexyl)phthalate (DEHP)	
(13)	330-54-1	206-354-4	Diuron	
(14)	115-29-7	204-079-4	Endosulfan	X

**a** CAS: Chemical Abstracts Service.

**b** EU number: European Inventory of Existing Commercial Substances (Einecs) or European List of Notified Chemical Substances (Elincs).

**c** Where groups of substances have been selected, typical individual representatives are listed as indicative parameters (in brackets and without number). For these groups of substances, the indicative parameter must be defined through the analytical method.

**d** These groups of substances normally include a considerable number of individual compounds. At present, appropriate indicative parameters cannot be given.

**e** Only Pentabromobiphenylether (CAS-number 32534-81-9).

**f** Fluoranthene is on the list as an indicator of other, more dangerous polyaromatic hydrocarbons.]

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(15)	206-44-0	205-912-4	Fluoranthene <sup>f</sup>	
(16)	118-74-1	204-273-9	Hexachlorobenzene <sup>c</sup>	X
(17)	87-68-3	201-765-5	Hexachlorobutadiene <sup>c</sup>	X
(18)	608-73-1	210-158-9	Hexachlorocyclohexane <sup>c</sup>	X
(19)	34123-59-6	251-835-4	Isoproturon	
(20)	7439-92-1	231-100-4	Lead and its compounds	
(21)	7439-97-6	231-106-7	Mercury and its compounds	X
(22)	91-20-3	202-049-5	Naphthalene	
(23)	7440-02-0	231-111-14	Nickel and its compounds	
(24)	25154-52-3	246-672-0	Nonylphenol	X
	104-40-5	203-199-4	(4-nonylphenol)	X
(25)	1806-26-4	217-302-5	Octylphenol	
	140-66-9	not applicable	(4-(1,1',3,3'-tetramethylbutyl)-phenol)	
(26)	608-93-5	210-172-5	Pentachlorobenzene <sup>c</sup>	X
(27)	87-86-5	231-152-8	Pentachlorophenol	
(28)	not applicable	not applicable	Polyaromatic hydrocarbons	X
	50-32-8	200-028-5	(Benzo(a)pyrene)	X
	205-99-2	205-911-9	(Benzo(b)fluoranthene)	X
	191-24-2	205-883-8	(Benzo(g,h,i)perylene)	X
	207-08-9	205-916-6	(Benzo(k)fluoranthene)	X
	193-39-5	205-893-2	(Indeno(1,2,3-cd)pyrene)	X
(29)	122-34-9	204-535-2	Simazine	

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**d** These groups of substances normally include a considerable number of individual compounds. At present, appropriate indicative parameters cannot be given.

**e** Only Pentabromobiphenylether (CAS-number 32534-81-9).

**f** Fluoranthene is on the list as an indicator of other, more dangerous polyaromatic hydrocarbons.]

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(30)	not applicable	not applicable	Tributyltin compounds	X
	36643-28-4	not applicable	(Tributyltin-cation)	X
(31)	12002-48-1	234-413-4	Trichlorobenzenes	
(32)	67-66-3	200-663-8	Trichloromethane (chloroform)	
(33)	1582-09-8	216-428-8	Trifluralin	

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**d** These groups of substances normally include a considerable number of individual compounds. At present, appropriate indicative parameters cannot be given.

**e** Only Pentabromobiphenylether (CAS-number 32534-81-9).

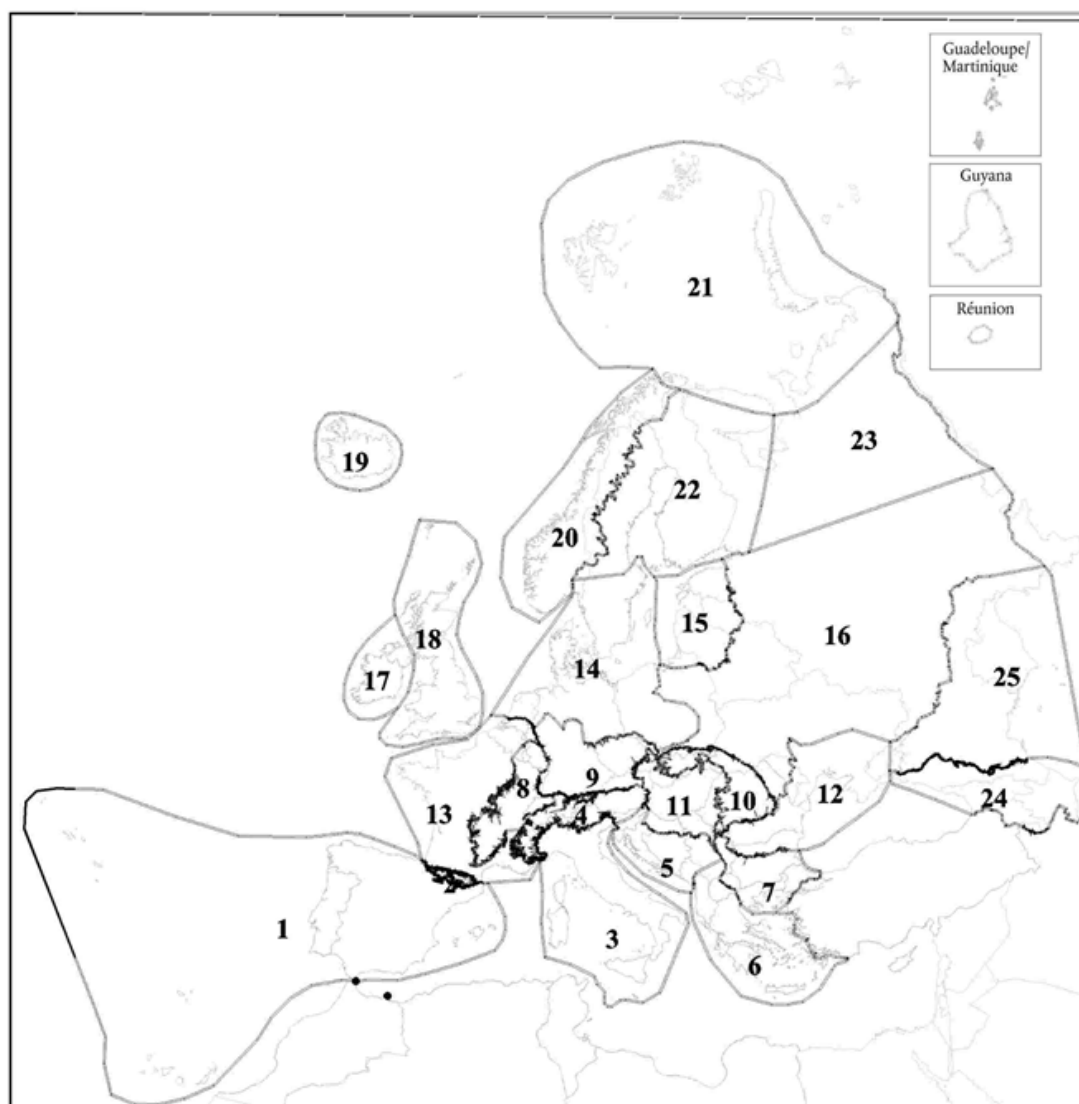
**f** Fluoranthene is on the list as an indicator of other, more dangerous polyaromatic hydrocarbons.]

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## ANNEX XI

### MAP ASystem A: Ecoregions for rivers and lakes

*Status: EU Directives are being published on this site to aid cross referencing from UK legislation. After IP completion day (31 December 2020 11pm) no further amendments will be applied to this version.*



1. Iberic-Macaronesian region
2. Pyrenees
3. Italy, Corsica and Malta
4. Alps
5. Dinaric western Balkan
6. Hellenic western Balkan
7. Eastern Balkan
8. Western highlands
9. Central highlands
10. The Carpathians

11. Hungarian lowlands
  12. Pontic province
  13. Western plains
  14. Central plains
  15. Baltic province
  16. Eastern plains
  17. Ireland and Northern Ireland
  18. Great Britain
  19. Iceland
  20. Borealic uplands
  21. Tundra
  22. Fenno-Scandian shield
  23. Taiga
  24. The Caucasus
  25. Caspic depression
- MAP B System A: Ecoregions for transitional waters and coastal waters

*Status: EU Directives are being published on this site to aid cross referencing from UK legislation. After IP completion day (31 December 2020 11pm) no further amendments will be applied to this version.*



1. Atlantic Ocean
2. Norwegian Sea
3. Barents Sea
4. North Sea
5. Baltic Sea
6. Mediterranean Sea

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- (1) OJ L 135, 30.5.1991, p. 40. Directive as last amended by Directive 98/15/EC (OJ L 67, 7.3.1998, p. 29).
- (2) OJ L 31, 5.2.1976, p. 1. Directive as last amended by the 1994 Act of Accession.
- (3) OJ L 281, 10.11.1979, p. 47. Directive as amended by Directive 91/692/EEC (OJ L 377, 31.12.1991, p. 48).
- (4) OJ L 375, 31.12.1991, p. 1.
- (5) OJ L 206, 22.7.1992, p. 7. Directive as last amended by Directive 97/62/EC (OJ L 305, 8.11.1997, p. 42).
- (6) OJ L 103, 25.4.1979, p. 1. Directive as last amended by Directive 97/49/EC (OJ L 223, 13.8.1997, p. 9).
- (7) OJ L 103, 25.4.1979, p. 1.
- (8) OJ L 10, 14.1.1997, p. 13.
- (9) OJ L 175, 5.7.1985, p. 40. Directive as amended by Directive 97/11/EC (OJ L 73, 14.3.1997, p. 5).
- (10) OJ L 181, 8.7.1986, p. 6.
- (11) OJ L 206, 22.7.1992, p. 7.
- (12) OJ L 81, 27.3.1982, p. 29.
- (13) OJ L 291, 24.10.1983, p. 1.
- (14) OJ L 74, 17.3.1984, p. 49.
- (15) OJ L 274, 17.10.1984, p. 11.
- (16) OJ L 181, 4.7.1986, p. 16.