

Annex to Groundwater (Water Framework Directive) Direction 2006



**COUNCIL OF
THE EUROPEAN UNION**

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DIRECTIVE 2005/.../EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of

on the protection of groundwater against pollution

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 175(1) thereof,

Having regard to the proposal from the Commission,

Having regard to the Opinion of the European Economic and Social Committee¹,

Having regard to the Opinion of the Committee of the Regions²,

Acting in accordance with the procedure laid down in Article 251 of the Treaty³,

¹ OJ C 112, 30.4.2004, p. 40.

² OJ C 109, 30.4.2004, p. 29.

³ Opinion of the European Parliament of 28 April 2005 (not yet published in the Official Journal), Council common position of ... (not yet published in the Official Journal) and Decision of the European Parliament of ... (not yet published in the Official Journal).

Whereas:

- (1) Groundwater is a valuable natural resource which should be protected from chemical pollution. This is particularly important for groundwater-dependent ecosystems and for the use of groundwater in water supply for human consumption.
- (2) Decision No 1600/2002/EC of the European Parliament and of the Council of 22 July 2002 laying down the Sixth Community Environment Action Programme¹ includes the objective to achieve water quality levels that do not give rise to significant impacts on, and risks to, human health and the environment.
- (3) In order to protect the environment as a whole, and human health in particular, detrimental concentrations of harmful pollutants in groundwater should be avoided, prevented or reduced.
- (4) 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 policy² sets out general provisions for the protection and conservation of groundwater. As provided for in Article 17 of that Directive, measures to prevent and control groundwater pollution should be adopted, including criteria for assessing good groundwater chemical status and criteria for the identification of significant and sustained upward trends and for the definition of starting points for trend reversals.

¹ OJ L 242, 10.9.2002, p. 1.

² OJ L 327, 22.12.2000, p. 1. Directive as amended by Decision No 2455/2001/EC (OJ L 331, 15.12.2001, p. 1).

- (5) Having regard to the need to achieve consistent levels of protection for groundwater, quality standards and threshold values should be established, and methodologies based on a common approach should be developed, in order to provide criteria for the assessment of the chemical status of bodies of groundwater.
- (6) Quality standards for nitrates, plant protection products and biocides should be set as Community criteria for the assessment of the chemical status of bodies of groundwater, and consistency should be ensured with Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources¹, Council Directive 91/414/EEC of 15 July 1991 concerning the placing of plant protection products on the market², and Directive 98/8/EC of the European Parliament and of the Council of 16 February 1998 concerning the placing of biocidal products on the market³, respectively.
- (7) Groundwater chemical status provisions do not apply to high naturally-occurring concentrations of substances or ions or their indicators, contained either in a body of groundwater or in associated bodies of surface water, due to specific hydro-geological conditions, which are not covered by the definition of pollution. Equally, they do not apply to temporary, spatially-limited changes in flow direction and chemical composition, which are not regarded as intrusions.
- (8) Criteria should be established for the identification of any significant and sustained upward trends in pollutant concentrations and for the definition of the starting point for trend reversal, taking into account the likelihood of adverse effects on associated aquatic ecosystems or dependent terrestrial ecosystems.

¹ OJ L 375, 31.12.1991, p. 1. Directive as amended by Regulation (EC) No 1882/2003 of the European Parliament and of the Council (OJ L 284, 31.10.2003, p. 1).

² OJ L 230, 19.8.1991, p. 1. Directive as last amended by Regulation (EC) No 396/2005 of the European Parliament and of the Council (OJ L 70, 16.3.2005, p. 1).

³ OJ L 123, 24.4.1998, p. 1. Directive as amended by Regulation (EC) No 1882/2003.

- (9) Member States should, where possible, use statistical procedures, provided they comply with international standards and contribute to the comparability of results of monitoring between Member States over long periods.
- (10) In accordance with the third indent of Article 22(2) of Directive 2000/60/EC, Council Directive 80/68/EEC of 17 December 1979 on the protection of groundwater against pollution by certain dangerous substances¹ is to be repealed with effect from 22 December 2013. It is necessary to ensure the continuity of the protection provided by Directive 80/68/EEC with regard to measures aimed at preventing or limiting both direct and indirect inputs of pollutants into groundwater.
- (11) It is necessary to distinguish between hazardous substances, inputs of which should be prevented, and other pollutants, inputs of which should be limited. Annex VIII to Directive 2000/60/EC, listing the main pollutants relevant for the water environment, should be used to identify hazardous and non-hazardous substances which present an existing or potential risk of pollution.
- (12) In order to ensure consistent protection of groundwater, Member States sharing bodies of groundwater should coordinate their activities in respect of monitoring, the setting of threshold values, and the identification of relevant hazardous substances.
- (13) In certain circumstances, Member States should be authorised to grant exemptions from measures to prevent or limit the input of pollutants into groundwater.

¹ OJ L 20, 26.1.1980, p. 43. Directive as amended by Directive 91/692/EEC (OJ L 377, 31.12.1991, p. 48).

- (14) It is necessary to provide for transitional measures to apply during the period between the date of implementation of this Directive and the date from which Directive 80/68/EEC is repealed.
- (15) The measures necessary for the implementation of this Directive should be adopted in accordance with Council Decision 1999/468/EC of 28 June 1999 laying down the procedures for the exercise of implementing powers conferred on the Commission¹,

HAVE ADOPTED THIS DIRECTIVE:

¹ OJ L 184, 17.7.1999, p. 23.

Article 1

Purpose

1. This Directive establishes specific measures as provided for in Article 17(1) and (2) of Directive 2000/60/EC in order to prevent and control groundwater pollution. These measures include in particular:

- (a) criteria for the assessment of good groundwater chemical status; and
- (b) criteria for the identification and reversal of significant and sustained upward trends and for the definition of starting points for trend reversals.

2. This Directive also complements the provisions preventing or limiting inputs of pollutants into groundwater already contained in Directive 2000/60/EC, and aims to prevent the deterioration of the status of all bodies of groundwater.

Article 2

Definitions

For the purposes of this Directive, the following definitions shall apply in addition to those laid down in Article 2 of Directive 2000/60/EC:

- (1) "groundwater quality standard" means an environmental quality standard expressed as the concentration of a particular pollutant, group of pollutants or indicator of pollution in groundwater, which should not be exceeded in order to protect human health and the environment;
- (2) "threshold value" means a groundwater quality standard set by Member States in accordance with Article 3;
- (3) "significant and sustained upward trend" means any statistically significant increase of concentration of a pollutant, group of pollutants, or indicator of pollution, which presents an environmental risk for which trend reversal is identified as being necessary in accordance with Article 5;
- (4) "input of pollutants into groundwater" means the direct or indirect introduction of pollutants into groundwater as a result of human activity.

Article 3

Criteria for assessing groundwater chemical status

1. For the purposes of the assessment of the chemical status of a body or a group of bodies of groundwater pursuant to Section 2.3 of Annex V to Directive 2000/60/EC, Member States shall use the following criteria:

- (a) groundwater quality standards as referred to in Annex I;
 - (b) threshold values to be established by Member States in accordance with the procedure set out in Part A of Annex II for the pollutants, groups of pollutants and indicators of pollution which, within the territory of a Member State, have been identified as contributing to the characterisation of bodies or groups of bodies of groundwater as being at risk, taking into account at least the list contained in Part B of Annex II.
2. Threshold values can be established at the national level, at the level of the river basin district or the part of the international river basin district falling within the territory of a Member State, or at the level of a body or a group of bodies of groundwater.
 3. Member States shall ensure that, for bodies of groundwater shared by two or more Member States and for bodies of groundwater within which groundwater flows across a Member State's boundary, the establishment of threshold values is subject to coordination between the Member States concerned, in accordance with Article 3(4) of Directive 2000/60/EC.
 4. Where a body or a group of bodies of groundwater extends beyond the territory of the Community, the Member State(s) concerned shall endeavour to establish threshold values in coordination with the non-Member State(s) concerned, in accordance with Article 3(5) of Directive 2000/60/EC.
 5. Member States shall establish threshold values pursuant to paragraph 1(b) for the first time by 22 December 2008 at the latest.

All threshold values established shall be published in the river basin management plans to be submitted in accordance with Article 13 of Directive 2000/60/EC, and including a summary of the information set out in Part C of Annex II.

6. Member States shall amend the list of threshold values whenever new information on pollutants, groups of pollutants, or indicators of pollution indicates that a threshold value should be set for an additional substance, that an existing threshold value should be amended, or that a threshold value previously removed from the list should be re-inserted, in order to protect human health and the environment.

Threshold values can be removed from the list when the body of groundwater concerned is no longer at risk from the corresponding pollutants, groups of pollutants, or indicators of pollution.

Any such changes to the list of threshold values shall be reported in the context of the periodic review of the river basin management plans.

7. The Commission shall publish a report by 22 December 2009 at the latest on the basis of the information provided by Member States in accordance with paragraph 5.

Article 4

Procedure for assessing groundwater chemical status

1. Member States shall use the procedure described in paragraph 2 to assess the chemical status of a body of groundwater. Where appropriate, Member States may group bodies of groundwater in accordance with Annex V to Directive 2000/60/EC when carrying out this procedure.

2. A body or a group of bodies of groundwater shall be considered to be of good chemical status when:
- (a) the values for the groundwater quality standards listed in Annex I and the relevant threshold values established in accordance with Article 3 and Annex II are not exceeded at any monitoring point in that body or group of bodies of groundwater; or
 - (b) the value for a groundwater quality standard or threshold value is exceeded at one or more monitoring points but an appropriate investigation in accordance with Annex III confirms that:
 - (i) on the basis of the assessment referred to in paragraph 3 of Annex III, the concentrations of pollutants exceeding the groundwater quality standards or threshold values are not considered to present a significant environmental risk, taking into account, where appropriate, the extent of the body of groundwater which is affected;
 - (ii) the other conditions for good groundwater chemical status set out in Table 2.3.2 in Annex V to Directive 2000/60/EC are being met, in accordance with paragraph 4 of Annex III to this Directive;
 - (iii) where appropriate, the requirements of Article 7(3) of Directive 2000/60/EC are being met, in accordance with paragraph 4 of Annex III to this Directive;

- (iv) the ability of the body of groundwater or of any of the bodies in the group of bodies of groundwater to support human uses has not been significantly impaired by pollution.

3. Member States shall publish a summary of the assessment of groundwater chemical status in the river basin management plans in accordance with Article 13 of Directive 2000/60/EC.

This summary, established at the level of the river basin district or the part of the international river basin district falling within the territory of a Member State, shall also include an explanation as to the manner in which exceedances of groundwater quality standards or threshold values at individual monitoring points have been taken into account in the final assessment.

4. If a body of groundwater is classified as being of good chemical status in accordance with paragraph 2(b), Member States, in accordance with Article 11 of Directive 2000/60/EC, shall take such measures as may be necessary to protect aquatic ecosystems, terrestrial ecosystems and human uses of groundwater dependent on the part of the body of groundwater represented by the monitoring point or points at which the value for a groundwater quality standard or the threshold value has been exceeded.

Article 5

Identification of significant and sustained upward trends and the definition of starting points for trend reversals

1. Member States shall identify any significant and sustained upward trend in concentrations of pollutants, groups of pollutants or indicators of pollution found in bodies or groups of bodies of groundwater identified as being at risk and define the starting point for reversing that trend, in accordance with Annex IV.

2. Member States shall reverse trends which present a significant risk of harm to the quality of aquatic ecosystems or terrestrial ecosystems, to human health, or to actual or potential legitimate uses of the water environment, through the programme of measures referred to in Article 11 of Directive 2000/60/EC, in order progressively to reduce pollution of groundwater.
3. Member States shall define the starting point for trend reversal as a percentage of the level of the groundwater quality standards set out in Annex I and of the threshold values established pursuant to Article 3, on the basis of the identified trend and the environmental risk associated therewith, in accordance with Part B, paragraph 1 of Annex IV.
4. In the river basin management plans to be submitted in accordance with Article 13 of Directive 2000/60/EC, Member States shall summarise:
 - (a) the way in which the trend assessment from individual monitoring points within a body or a group of bodies of groundwater has contributed to identifying, in accordance with Section 2.5 of Annex V to that Directive, that those bodies are subject to a sustained and significant upward trend in concentration of any pollutant or a reversal of that trend; and
 - (b) the reasons for the starting points defined pursuant to paragraph 3.

5. Where necessary to assess the impact of existing plumes of pollution in bodies of groundwater that may threaten the achievement of the objectives in Article 4 of Directive 2000/60/EC, and in particular, those plumes resulting from point sources and contaminated land, Member States shall carry out additional trend assessments for identified pollutants in order to verify that plumes from contaminated sites do not expand, do not deteriorate the chemical status of the body or group of bodies of groundwater, and do not present a risk for human health and the environment. The results of these assessments shall be summarised in the river basin management plans to be submitted in accordance with Article 13 of Directive 2000/60/EC.

Article 6

Measures to prevent or limit inputs of pollutants into groundwater

1. In order to achieve the objective of preventing or limiting inputs of pollutants into groundwater, established in accordance with Article 4(1)(b)(i) of Directive 2000/60/EC, Member States shall ensure that the programme of measures established in accordance with Article 11 of that Directive includes:
 - (a) all measures necessary to aim to prevent inputs into groundwater of any hazardous substances. In identifying such substances, Member States shall in particular take account of hazardous substances belonging to the families or groups of pollutants referred to in points 1 to 6 of Annex VIII to Directive 2000/60/EC, as well as of substances belonging to the families or groups of pollutants referred to in points 7 to 9 of that Annex, where these are considered to be hazardous;

- (b) for pollutants listed in Annex VIII to Directive 2000/60/EC which are not considered hazardous, and any other non-hazardous pollutants not listed in that Annex considered by Member States to present an existing or potential risk of pollution, all measures necessary to limit inputs into groundwater so as to ensure that such inputs do not cause deterioration of good groundwater chemical status, do not cause any significant and sustained upward trends in the concentrations of pollutants in groundwater, and do not otherwise cause pollution of groundwater. Such measures shall take account of established best practice, including the Best Environmental Practice and Best Available Techniques specified in the relevant Community legislation.

For the purpose of establishing measures referred to in points (a) or (b), Member States may, as a first step, identify the circumstances under which the pollutants listed in Annex VIII to Directive 2000/60/EC, in particular essential metals and their compounds referred to in point 7 of that Annex, are to be considered hazardous or non-hazardous.

2. Inputs of pollutants from diffuse sources of pollution having an impact on the groundwater chemical status shall be taken into account whenever technically possible.
3. Without prejudice to any more stringent requirements in other Community legislation, Member States may exempt from the measures required by paragraph 1 inputs of pollutants that are:
 - (a) the result of direct discharges authorised in accordance with Article 11(3)(j) of Directive 2000/60/EC;

- (b) considered by the competent authorities to be of a quantity and concentration so small as to obviate any present or future danger of deterioration in the quality of the receiving groundwater;
- (c) the consequences of accidents or exceptional circumstances of natural cause that could not reasonably have been foreseen, avoided or mitigated;
- (d) the result of artificial recharge or augmentation of bodies of groundwater authorised in accordance with Article 11(3)(f) of Directive 2000/60/EC;
- (e) considered by the competent authorities to be not technically feasible to prevent or limit without using:
 - (i) measures that would increase risks to human health or to the quality of the environment as a whole; or
 - (ii) disproportionately costly measures to remove quantities of pollutants from, or otherwise control their percolation in, contaminated ground or subsoil; or
- (f) the result of interventions in surface waters for the purposes, amongst others, of mitigating the effects of floods and droughts, and for the management of waters and waterways, including at international level. Such activities, including cutting, dredging, relocation and deposition of sediments in surface water, shall be conducted in accordance with general binding rules, and, where applicable, with permits and authorisations issued on the basis of such rules, developed by the Member States for that purpose, provided that such inputs do not compromise the achievement of the environmental objectives established for the water bodies concerned in accordance with Article 4(1)(b)(ii) of Directive 2000/60/EC.

4. The competent authorities of the Member States shall keep an inventory of the exemptions referred to in paragraph 3 for the purpose of notification, upon request, to the Commission.

Article 7

Transitional arrangements

In the period between ...* and 22 December 2013, any new authorisation procedure pursuant to Articles 4 and 5 of Directive 80/68/EEC shall take into account the requirements set out in Articles 3, 4 and 5 of this Directive.

Article 8

Technical adaptations

Annexes II, III and IV may be adapted to scientific and technical progress in accordance with the procedure referred to in Article 21(2) of Directive 2000/60/EC, taking into consideration the period for reviewing and updating river basin management plans, as referred to in Article 13(7) of that Directive.

Article 9

Implementation

Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive before ...*. They shall forthwith inform the Commission thereof.

* OJ: Two years after the entry into force of this Directive.

When Member States adopt these measures, they shall contain a reference to this Directive or shall be accompanied by such reference on the occasion of their official publication. The methods of making such reference shall be laid down by Member States.

Article 10

Entry into force

This Directive shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

Article 11

Addressees

This Directive is addressed to the Member States.

Done at ...,

For the European Parliament

The President

For the Council

The President

ANNEX I
GROUNDWATER QUALITY STANDARDS

1 For the purposes of assessing groundwater chemical status in accordance with Article 4, the following groundwater quality standards will be the quality standards referred to in Table 2.3.2 in Annex V to Directive 2000/60/EC and established in accordance with Article 17 of that Directive.

Pollutant	Quality standards	Comment
Nitrates	50 mg/l	For activities falling within the scope of Directive 91/676/EEC, programmes and measures required in relation to this value (i.e. 50 mg/l) will be in accordance with that Directive ¹ .
Active substances in pesticides, including their relevant metabolites, degradation and reaction products ²	0,1 µg/l 0,5 µg/l (total) ³	

¹ Activities outside the scope of Directive 91/676/EEC are not covered by this provision.

² "Pesticides" means plant protection products and biocidal products as defined in Article 2 of Directive 91/414/EEC and in Article 2 of Directive 98/8/EC, respectively.

³ "Total" means the sum of all individual pesticides detected and quantified in the monitoring procedure.

- 2 The results of the application of the quality standards for pesticides in the manner specified for the purposes of this Directive will be without prejudice to the results of the risk assessment procedures required by Directive 91/414/EEC or Directive 98/8/EC.
- 3 Where, for a given body of groundwater, it is considered that the groundwater quality standards could result in failure to achieve the environmental objectives specified in Article 4 of Directive 2000/60/EC for associated bodies of surface water, or in any significant diminution of the ecological or chemical quality of such bodies, or in any significant damage to terrestrial ecosystems which depend directly on the body of groundwater, more stringent threshold values will be established in accordance with Article 3 and Annex II to this Directive. Programmes and measures required in relation to such a threshold value will also apply to activities falling within the scope of Directive 91/676/EEC.
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ANNEX II
**THRESHOLD VALUES FOR GROUNDWATER POLLUTANTS
AND INDICATORS OF POLLUTION**

**PART A: GUIDELINES FOR THE ESTABLISHMENT OF THRESHOLD VALUES BY MEMBER STATES IN
ACCORDANCE WITH ARTICLE 3**

Member States will establish threshold values for all pollutants and indicators of pollution which, pursuant to the characterisation performed in accordance with Article 5 of Directive 2000/60/EC, characterise bodies or groups of bodies of groundwater as being at risk of failing to achieve good groundwater chemical status.

Threshold values will be established in such a way that, should the monitoring results at a representative monitoring point exceed the thresholds, this will indicate a risk that one or more of the conditions for good groundwater chemical status referred to in Article 4(2)(b)(ii), (iii) and (iv) are not being met.

When establishing threshold values, Member States will consider the following guidelines:

1. The determination of threshold values should be based on:
 - (a) the extent of interactions between groundwater and associated aquatic and dependent terrestrial ecosystems;

- (b) the interference with actual or potential legitimate uses or functions of groundwater;
 - (c) all pollutants which characterise bodies of groundwater as being at risk, taking into account the minimum list set up in part B;
 - (d) hydro-geological characteristics including information on background values and water balance.
2. The determination of threshold values should also take account of the origins of the pollutants, their possible natural occurrence, their toxicology and dispersion tendency, their persistence and their bioaccumulation potential.
3. The determination of threshold values should be supported by a control mechanism for the data collected, based on an evaluation of data quality, analytical considerations, and background levels for substances which may occur both naturally and as a result of human activities.

**PART B: MINIMUM LIST OF POLLUTANTS AND THEIR INDICATORS FOR WHICH MEMBER STATES
HAVE TO CONSIDER ESTABLISHING THRESHOLD VALUES IN ACCORDANCE WITH
ARTICLE 3**

**1. Substances or ions which may occur both naturally and
as a result of human activities**

Arsenic

Cadmium

Lead

Mercury

Ammonium

Chloride

Sulphate

2. Man-made synthetic substances

Trichloroethylene

Tetrachloroethylene

3. Parameters indicative of saline or other intrusions ¹

Conductivity

¹ With regard to saline concentrations resulting from human activities, Member States may decide to establish threshold values either for sulphate and chloride or for conductivity.

**PART C: INFORMATION TO BE PROVIDED BY MEMBER STATES WITH REGARD TO THE POLLUTANTS
AND THEIR INDICATORS FOR WHICH THRESHOLD VALUES HAVE BEEN ESTABLISHED**

Member States will summarise, in the river basin management plans to be submitted in accordance with Article 13 of Directive 2000/60/EC, the way the procedure set out in Part A of this Annex has been followed.

In particular, Member States will provide, where feasible:

- (a) information on the number of bodies or groups of bodies of groundwater characterised as being at risk and on the pollutants and indicators of pollution which contribute to this classification, including the observed concentrations/values;
- (b) information on each of the bodies of groundwater characterised as being at risk, in particular the size of the bodies, the relationship between the bodies of groundwater and the associated surface waters and directly dependent terrestrial ecosystems, and, in the case of naturally-occurring substances, the natural background levels in the bodies of groundwater;
- (c) the threshold values, whether they apply at the national level, at the level of the river basin district or the part of the international river basin district falling within the territory of the Member State, or at the level of a body or a group of bodies of groundwater;
- (d) the relationship between the threshold values and:
 - (i) in the case of naturally-occurring substances, the observed background levels,
 - (ii) the environmental quality objectives and other standards for water protection that exist at national, Community or international level, and
 - (iii) any relevant information concerning the toxicology, eco-toxicology, persistence, bioaccumulation potential, and dispersion tendency of the pollutants.

ANNEX III

ASSESSMENT OF GROUNDWATER CHEMICAL STATUS

1. The assessment procedure for determining the chemical status of a body or a group of bodies of groundwater will be carried out in relation to all bodies or groups of bodies of groundwater characterised as being at risk and in relation to each of the pollutants which contribute to the body or group of bodies of groundwater being so characterised.
2. In undertaking any investigations referred to in Article 4(2)(b), Member States will take into account:
 - (a) the information collected as part of the characterisation to be carried out in accordance with Article 5 of Directive 2000/60/EC and with Sections 2.1, 2.2 and 2.3 of Annex II thereto;
 - (b) the results of the groundwater monitoring network obtained in accordance with Section 2.4 of Annex V to Directive 2000/60/EC; and
 - (c) any other relevant information including a comparison of the annual arithmetic mean concentration of the relevant pollutants at a monitoring point with the groundwater quality standards set out in Annex I and the threshold values set by Member States in accordance with Article 3 and Annex II.

3. For the purposes of investigating whether the conditions for good groundwater chemical status referred to in Article 4(2)(b)(i) and (iv) are met, Member States will, where relevant and necessary, and on the basis of appropriate aggregations of the monitoring results, supported where necessary by concentration estimations based on a conceptual model of the body or group of bodies of groundwater, estimate the extent of the body of groundwater having an annual arithmetic mean concentration of a pollutant higher than a groundwater quality standard or a threshold value.
4. For the purposes of investigating whether the conditions for good groundwater chemical status referred to in Article 4(2)(b)(ii) and (iii) are met, Member States will, where relevant and necessary, and on the basis of relevant monitoring results and of a suitable conceptual model of the body of groundwater, assess:
 - (a) the amounts and the concentrations of the pollutants being, or likely to be, transferred from the body of groundwater to the associated surface waters or directly dependent terrestrial ecosystems;
 - (b) the likely impact of the amounts and concentrations of the pollutants transferred to the associated surface waters and directly dependent terrestrial ecosystems;
 - (c) the extent of any saline or other intrusions into the body of groundwater; and
 - (d) the risk from pollutants in the body of groundwater to the quality of water abstracted, or intended to be abstracted, from the body of groundwater for human consumption.

5. Member States will present the groundwater chemical status of a body or a group of bodies of groundwater on maps in accordance with Sections 2.4.5 and 2.5 of Annex V to Directive 2000/60/EC. In addition, Member States will indicate on these maps all monitoring points where groundwater quality standards and/or threshold values are exceeded, where relevant and feasible.



ANNEX IV
**IDENTIFICATION AND REVERSAL OF SIGNIFICANT
AND SUSTAINED UPWARD TRENDS**

PART A: IDENTIFICATION OF SIGNIFICANT AND SUSTAINED UPWARD TRENDS

Member States will identify significant and sustained upward trends in all bodies or groups of bodies of groundwater that are characterised as being at risk in accordance with Annex II to Directive 2000/60/EC, taking into account the following requirements:

1. in accordance with Section 2.4 of Annex V to Directive 2000/60/EC, the monitoring programme will be so designed as to detect significant and sustained upward trends in concentrations of the pollutants identified pursuant to Article 3 of this Directive;
2. the procedure for the identification of significant and sustained upward trends will be based on the following elements:
 - (a) monitoring frequencies and monitoring locations will be selected such as are sufficient to:
 - (i) provide the information necessary to ensure that such upward trends can be distinguished from natural variation with an adequate level of confidence and precision;

- (ii) enable such upward trends to be identified in sufficient time to allow measures to be implemented in order to prevent, or at least mitigate as far as practicable, environmentally significant detrimental changes in groundwater quality. This identification will be carried out for the first time by 2009, if possible, and will take into account existing data, in the context of the report on trend identification within the first river basin management plan referred to in Article 13 of Directive 2000/60/EC, and at least every six years thereafter;
 - (iii) take into account the physical and chemical temporal characteristics of the body of groundwater, including groundwater flow conditions and recharge rates and percolation time through soil or subsoil.
- (b) the methods of monitoring and analysis used will conform to international quality control principles, including, if relevant, CEN or national standardised methods, to ensure equivalent scientific quality and comparability of the data provided;
 - (c) the assessment will be based on a statistical method, such as regression analysis, for trend analysis in time series of individual monitoring points;
 - (d) in order to avoid bias in trend identification, all measurements below the quantification limit will be set to half of the value of the highest quantification limit occurring in time series, except for total pesticides;
3. the identification of significant and sustained upward trends in the concentrations of substances which occur both naturally and as a result of human activities will consider the data collected before the start of the monitoring programme in order to report on trend identification within the first river basin management plan referred to in Article 13 of Directive 2000/60/EC, where such data is available.

PART B: STARTING POINTS FOR TREND REVERSALS

According to Article 5, Member States will reverse identified significant and sustained upward trends where these trends present a risk of harm to associated aquatic ecosystems, to directly dependent terrestrial ecosystems, to human health or to actual or potential legitimate uses of the water environment, taking into account the following requirements:

1. the starting point for implementing measures to reverse significant and sustained upward trends will be when the concentration of the pollutant reaches 75% of the parametric values of the groundwater quality standards set out in Annex I and of the threshold values established pursuant to Article 3, unless:
 - (a) an earlier starting point is required to enable trend reversal measures to prevent most cost-effectively, or at least mitigate as far as possible, any environmentally significant detrimental changes in groundwater quality;
 - (b) a different starting point is justified where the detection limit does not allow for establishing the presence of a trend at 75% of the parametric values; or
 - (c) the rate of increase and the reversibility of the trend are such that a later starting point for trend reversal measures would still enable such measures to prevent most cost-effectively, or at least mitigate as far as possible, any environmentally significant detrimental changes in groundwater quality.

For activities falling within the scope of Directive 91/676/EEC, the starting point for implementing measures to reverse significant and sustained upward trends will be established in accordance with that Directive and with Directive 2000/60/EC;

2. once a starting point has been established for a body of groundwater characterised as being at risk in accordance with Section 2.4.4 of Annex V to Directive 2000/60/EC and pursuant to Part B, paragraph 1 of this Annex, it will not be changed during the six-year cycle of the river basin management plan required in accordance with Article 13 of Directive 2000/60/EC;
3. trend reversals will be demonstrated, taking into account relevant monitoring provisions contained in Part A, paragraph 2.
