

ANNEX V

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

Elements	Good status
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. Accordingly, the level of groundwater is not subject to anthropogenic alterations such as would result in:</p> <ul style="list-style-type: none"> — failure to achieve the environmental objectives specified under Article 4 for associated surface waters, — any significant diminution in the status of such waters, — any significant damage to terrestrial ecosystems which depend directly on the groundwater body, <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:

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- 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"> — as specified below, do not exhibit the effects of saline or other intrusions — do not exceed the quality standards applicable under other relevant Community legislation in accordance with Article 17 — 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.

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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

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.