



A critical assessment of Europe's Groundwater quality protection Under the new Groundwater Directive

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1. Introduction and Summary

The European Union has had little success in protecting the groundwater resource, which provides drinking water for some 300 million citizens. Well known problems like nitrate and pesticide pollution from agriculture persist, while many industrial chemicals can be found in groundwater posing a potential long-term and irreversible threat to this sensitive ecosystem and natural resource.

This has happened despite 25 years of strong pollution-prevention obligations being enshrined in EU law, including specific controls on nitrates passed in the 1980s and pesticides in the 1990s.

Now, a new Groundwater Protection law (new GWD) is in its final form and is expected to enter into force this year. This represents a second chance for groundwater protection. The new law basically reconfirms the old approach but introduces new flexibility for Member States. So how does this mean progress? In 2000, Europe completely reshaped its water management rules with by adopting the Water Framework Directive (WFD). This introduced a holistic ecosystem-based protection approach requiring a complete new understanding of groundwater as an important part of the aquatic ecosystem, which cannot be successfully managed in isolation. The WFD introduced a new package of measures, like water-pricing, increased transparency, reporting, and greater rights for citizens and their organisations to participate in developing river basin management plans.

This means that in future it will be harder for Member States to escape public, legal and EU-wide scrutiny of what is or isn't done, at national or regional level: this could mean more effective implementation and achievement of objectives in future. But in order to get there, it is vital that environmentalists and authorities understand both the new GWD and the WFD, and use them in the best way to achieve environmental objectives, rather than simply adopting a minimalist approach to satisfy EU reporting requirements.

Most importantly, the new GWD reinstates a clear and legally-enforceable obligation to prevent the input of hazardous chemicals into groundwater – this means that the EU does not accept that such chemicals should be present in groundwater, and thus recognises the intrinsic value of unpolluted groundwater, and the importance of applying precautionary protection for such a vulnerable resource. The new Directive also acknowledges groundwater to be a vulnerable ecosystem which provides essential services to ensure a sufficient supply of healthy drinking water and maintain a rich range of biodiversity.

2. State of groundwater quality in Europe

Groundwater is generally invisible and thus is difficult to appreciate and protect. But some 300 million Europeans obtain their daily drinking water from groundwater resources. All our rivers, lakes and coastal waters are linked with groundwater and depend to some extent on its quality. Several endangered aquatic and terrestrial ecosystems also depend on the groundwater supply. Groundwater has a further value: It represents a vulnerable and unique habitat of over 2,000 species especially adapted to subterranean conditions over millions of years. Much research remains to be done on these ecosystems, but it is already clear that maintaining an intact range of natural groundwater fauna helps break down potential pollutants, thus helping to ensure good water quality. The complex interrelations within and between ecosystems underline the need for a precautionary approach for groundwater protection over the whole area.

Surprisingly little is known about the state of and trends in groundwater quality. Fauna living in groundwater are not yet monitored and there are as yet only limited data available for chemical quality parameters. However, there is ample evidence that pollution from diffuse sources like intensive agriculture or traffic causes serious contamination. According to the European Environment Agency, nitrate pollution remains high, with some 40 per cent of groundwater heavily polluted with pesticides and other pollutants found nearly everywhere¹. This is highlighted by the recent scandal of perfluorinated chemicals² contaminating groundwater drinking supplies in Germany, forcing pregnant women and families with children to rely on bottled drinking water supplied by the government.

Considering the increasing 'chemical intensity' of our economies, relentless urban sprawl, the conversion of natural land for development, and escalating transport activity in Europe, it is clear that pressure on groundwater quality is increasing and that we are only seeing the tip of the iceberg. As we look ahead, future threats to groundwater quality, like plans to store CO₂ in deep aquifers and the development of geothermic plants, both with as yet unknown consequences for groundwater quality, loom over the horizon.

In addition, falling groundwater levels, often due to illegal abstraction, will further endanger its chemical quality and its ability to cleanse itself. Already, along most stretches of the Mediterranean coast, over-abstraction has induced saltwater intrusion, rendering the groundwater useless for drinking and other purposes.

¹ http://themes.eea.europa.eu/Specific_media/water/indicators/WEU01%2C2004.05 and http://themes.eea.europa.eu/Specific_media/water/indicators/WHS01a%2C2004.05

² potentially carcinogenic surfactants which do not rapidly break down in the environment and accumulate in human tissue, like breast milk.

3. The New Groundwater Directive

3.1. Introduction and background

Groundwater protection in Europe began with the 1980 Groundwater Directive, which adopted a strong pollution prevention approach by requiring countries to prevent the input of hazardous substances³ and limit input of all other substances to avoid pollution. In 1991, the Nitrates Directive introduced a groundwater action value of 50mg/l for nitrates, requiring Member States to apply emissions control measures for agricultural activities in order to stop the pollution of drinking water and eutrophication of rivers, lakes and coastal waters. Also in 1991, a new EU authorisation procedure for pesticides was adopted as European law. This effectively established an obligation to keep groundwater pesticide-free (for further reading see chapters IV.5.7 and V.4.6.5 of EEB's EU environmental policy handbook)⁴.

Despite this seemingly comprehensive protection regime, little has been achieved in terms of objectives. Many Member States have simply failed to put in place adequate measures to protect groundwater or meet legal obligations. As a result pollution is still increasing and several Member States still face infraction proceedings. In December 2000, the European Water Framework Directive was adopted. This will repeal the 1980 Groundwater Directive in 2013. During the Water Framework Directive negotiations, there was no clear consensus on how to address the massive implementation deficit for groundwater protection. Instead, decisions were postponed, to negotiation of the new Groundwater Directive, which will be discussed in the following chapters.

The new Groundwater Directive has not yet been adopted by European legislators, however the European Parliament and Council, reached a formalised agreement on a joint text for the Directive on 17 October⁵. Parliament and Council are expected to adopt the law in December 2006, which then enters into force once it is published in the Official Journal of the European Union.

3.2. Scope, Objectives and Targets

The new Groundwater Directive is a 'daughter' of the Water Framework Directive (WFD) and can only be understood in this context. Articles 1, 4 and 17, and Annex V of the WFD provide the general purpose and specific objectives, which are then further refined and clarified by the new Groundwater Directive (new GWD).

Article 1 of the WFD sets out the purpose which includes *“sufficient supply of good quality groundwater as needed for sustainable, balanced and equitable water use”, “significant reduction in pollution of groundwater”* and *“achieving the objectives of relevant international agreements, including those ... with the ultimate aim of achieving concentrations in the marine environment near background values for naturally occurring substances and close to zero for man-made synthetic substances.”*

Action to achieve the last objective is often focused on controlling point sources of pollutants in surface waters. However, the growing recognition of groundwater as a very active part of the water cycle would lead to a stronger emphasis on dealing with diffuse sources of pollution, which are the main path of groundwater pollution.

³ Hazardous substances. means substances or groups of substances that are toxic, persistent and liable to bio-accumulate, and other substances or groups of substances which give rise to an equivalent level of concern.

⁴ http://www.eeb.org/publication/policy_handbook.htm

⁵ http://www.eeb.org/press/pr_groundwater_181006.htm

Article 4.1b of the WFD sets the following specific groundwater quality objectives, which are then further clarified by the new GWD

- for all groundwater:
 - to prevent or limit input of pollutants, which **Article 6.1 of the new GWD** clarifies as to “*prevent inputs of any hazardous substances*” and “*limit input of all other substances*”_so that they do not cause *deterioration* or *significant sustained upward trends* in the concentration of pollutants.⁶
 - to *reverse any significant and upward trend in the concentration of any pollutant so as to progressively reduce pollution*. **Article 5 of the new GWD** nevertheless seems to limit the practical application of this obligation to groundwater bodies, and specifies that measures to reverse trends must be implemented when pollutant concentrations reach 75 per cent of a groundwater quality standard. Exemptions from this value are allowed when justified.
- for all groundwater bodies, which might not cover all groundwater (i.e. groundwater in isolated aquifers or impervious geological formations):
 - to *achieve good chemical status by 2015*. **Article 4 of the new GWD** specifies what is meant by ‘good’ status: i) no significant negative impact on surface waters or terrestrial ecosystems; or ii) the two EU wide quality standards: 50mg/l nitrates and 0.1µg/l pesticides and others set nationally are achieved; or iii) quality standards are not met but no significant negative impact on surface waters or terrestrial ecosystems is likely and human uses are not impaired, i.e. level of purification treatment for drinking water is reducing.
 - to *prevent deterioration of chemical status*. This important standstill clause should help avoid past errors, and is especially important because once polluted, groundwater often needs several decades to be cleansed. Nevertheless, this no-deterioration obligation is linked to the status class, meaning that the only step that must be prevented is crossing the boundary between ‘good’ and ‘poor’ status. Deterioration within these two, and there are only two, status classes is allowed. The backstops here are the obligation to reverse trends of individual pollutants concentrations well before a standard is breached.

3.3. Exemptions

The main exemptions relevant for groundwater protection are provided by **Articles 4.4, 4.5, 4.6 and 4.7 WFD**. Article 4.4 allows an **extension** of the **2015 deadline** for achieving good chemical status by up to 12 years (two River Basin Management planning cycles). This is likely to be widely used for groundwater because of the slow recovery time and high costs in cleaning up polluted groundwater. Article 4.5 allows **setting a lower objective** than *good chemical status* owing to technical infeasibility or disproportionate costs. Article 4.6 allows the **temporary deterioration of the chemical status**, failing to achieve good chemical status or reversing trends in case of exceptional and unforeseen natural events (droughts, floods, earthquakes, etc). Finally, Article 4.7 allows the **prolonged deterioration of status or failing to reverse trends due to new developments**, for which there are no environmentally better alternatives and where there is an overriding public interest.

⁶ Note that the definition of ‘*deterioration*’ applies to groundwater bodies, not groundwater in general.

Derogations may not be applied to the objectives of *Protected Areas* identified under the WFD. These include *Nitrate Vulnerable Zones*, water bodies identified as sources of drinking water under Article 7 of the WFD and water dependent *Natura 2000* sites. There is, however, some legal ambiguity over whether the timetable for delivery can be extended under Article 4.4. This has yet to be resolved and the issue may turn on the wording and intent of the various pieces of EU law under which the objectives for *Protected Areas* were originally established.

It is important to note that the application of exemptions is a political process which must meet tough transparency and public participation requirements. Consideration of derogations should be separate from the purely scientific process of identifying hazardous substances which are to be prevented, or the definition of *Good Chemical Status*, which decides what colour codes appear on the final groundwater body maps reported in River basin Management Plans.

A good explanation on setting objectives and applying exemptions can be found in the policy document, adopted by EU Water Directors under the Common WFD Implementation Strategy⁷.

Article 6.3 of the new GWD provides further exemptions to obligations to prevent the input of hazardous substances and limit all others. These exemptions are taken partly from the 1980 Groundwater Directive, e.g. giving authorities discretion to decide that the quantity and concentration of specific hazardous substance inputs is so small that it will not damage the quality of groundwater (Article 6.3 b). This has been referred to as a '*de minimis*' clause, ensuring that the absolute legal obligation to prevent any input of hazardous substances, however small the amount, is practicable and does not result in costly and environmentally damaging measures, like removing large quantities of slightly contaminated soil to landfill. However, unlike the 1980 Groundwater Directive, the use of this exemption must be justified and reported through the River Basin Management planning process.

The new GWD also provides a new exemption from the prevent and limit obligation allowing Member States to exempt inputs resulting from interventions in surface waters, like weed cutting, dredging, relocating sediments (for navigation, flood defence, etc) as long as this does not compromise good chemical groundwater status, or trend reversal obligations.

Article 6.2 of the new GWD is rather unclear, and could be interpreted as providing a new exemption for inputs from diffuse sources, which harm groundwater chemical status, as it only requires action where *technically feasible*. It is worth noting that the test of *technical feasibility* is exactly that, and does not consider the costs involved. The exemption seems to state the obvious, since one can only achieve the possible, although that might include a range of politically unpopular actions including product bans and substitutions. This interpretation would allow only very limited application of the derogation, for example where it might be considered technically impossible to deal with contaminated land or the aftermath of a disaster.

However, Article 6.2 can also be interpreted to mean that only diffuse inputs of pollutants, which have a negative impact on the chemicals status and can be technically controlled, must be dealt with. Since Member States are unlikely to set threshold values for the bulk of hazardous substances, this would mean that diffuse inputs are unlikely to trigger a failure unless they have an impact on surface water standards or *Groundwater Dependent Terrestrial Ecosystems*. This would suggest that substances for which threshold values have not been set

⁷http://forum.europa.eu.int/Public/irc/env/wfd/library?l=/framework_Directive/thematic_documents/environmental_objectives/environmental_20605pdf/_EN_1.0_&a=d

would not fall under the strict prevention obligation at all. In view of the general purpose and objectives of groundwater protection, this interpretation would be questionable.

3.4. Implementation: Measures and Timetable

The timetable for implementing the new GWD depends on the final adoption and publication in the European Official Journal. Assuming this is done before 31 December to avoid having to translate it into Romanian, Bulgarian and Gaelic, Member States should have transposed the new GWD into national law by 2009. The WFD's draft River Basin Management plans (RBMPs) must simultaneously be presented for public consultation. These RBMPs contain the programme of measures which should include all relevant measures to achieve the groundwater protection objectives.

	<i>Requirements in the first monitoring period according to WFD</i>
Est. 2007	New Groundwater Directive will enter into force.
2007/ 2008	<p>According to Art. 8 and Annex IV of the Water Framework Directive, Member States must identify the “baseline level” for the trend assessment of the groundwater status. Art. 2 (4b) of the new GWD clarifies that “baseline level” means the average value [of pollution concentration] measured at least during the reference years 2007 and 2008. The monitoring results particularly provide the basis to assess the trend of groundwater pollution over the following years and assess the effects of all measures which are introduced for groundwater protection and trend reversal.</p> <p>Art. 2 (4b) of the new Groundwater Directive also considers substances for the baseline level which are identified after these reference years. In this case, the relevant value must be determined during the first period for which a representative period of monitoring data is available.</p>
2007/2008	According to Art. 8 and Annex IV of the Water Framework, Member States must assess the groundwater status . Article 4 of the new GWD provides details for carrying out the assessment.
22.12.2008	According to Art. 3 of the new GWD, threshold values (national quality standards) for pollutants must be established by Member States. The procedure and criteria are set out in Annex II part A (e.g. consideration of groundwater functions, interrelation with groundwater dependent ecosystem or toxicology of pollutants). At the very least, Member States must establish values for the listed pollutants in Annex II Part B. The threshold values complement EU-wide quality standards and consequently contribute to the definition of groundwater status needed for groundwater assessment. Threshold values can be established at national level, but also for a whole river basin district or for each groundwater body.

<i>in period of finalisation of first RBMPs, according to WFD</i>	
2008/2009	According to Art. 6 of the new GWD, programmes of measures must ensure the following requirements for the prevent and limit approach : The input of hazardous substances (pollutants under points 1- 6 of WFD Annex VIII & relevant pollutants under points 7-9) shall be prevented. The input off all other pollutants shall be limited at least according to the Best Environmental Practice and Best Available Techniques.
2009	Identification of pollution trend in groundwater bodies for the first time (according to Annex IV Part A of the new GWD).
Est. 3/2009	Transposition of the Groundwater Directive must be finalised, at the latest.
Est. 3/2009	Authorisation procedure according to GWD 80/68/EEC must consider the requirements of Art. 3-5 of the new GWD (until 2013).
22.12.2009	Commission report about national threshold values. Threshold values and groundwater bodies at risk must be published in the River Basin Management Plans.
<i>in period of revision of reviews, analysis according to WFD (review WFD impact assessment and economic analysis every six years)</i>	
22.12.2012 & every six years	Report by the Commission concerning WFD implementation should include an evaluation of the functioning of the new Groundwater Directive in relation to other environmental legislation.
22.12.2012 and regularly	Annex II, Part B, may be amended, in accordance with regulatory procedure with scrutiny to add new pollutants or indicators.
22.12.2013 & every six Years	Review of the Groundwater Directive. Commission shall review Annexes I and II of this Directive. Based on the review, it shall, if appropriate, come forward with legislative proposals, in accordance with the procedure laid down in Article 251 of the Treaty, to amend Annexes I and/or II.
22.12.2013	GWD 80/68/EEC repealed
22.12.2015	Good chemical status achieved or deadline extended
<i>in the period of revision of RBPMs according to WFD (review WFD management plans every six years)</i>	
22.12.2015 & every six years	Annexes II, Parts A and C, III and IV o he new GWD may be amended, in the light of scientific and technical progress.
<i>Requirements for relevant groundwater status objectives according to WFD</i>	
22.12.2027	Good chemical status of groundwater bodies is achieved at the latest by this date unless an exemption is justified owing to slow natural recovery processes.

Identification of inputs of substances to be prevented or to be limited

The obligation to prevent the input of substances now covers all possible hazardous pollutants, unlike the list approach adopted in the old Groundwater Directive 80/68/EEC. However, while the new Directive leaves Member States to identify whether or not a substance is hazardous, they are required to specifically “take into account” substances 1-6 listed in Annex VIII of the WFD as well as substances 7-9 on the same list, where they are considered to be hazardous(see below).

	Substance or family
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 these, which have been proved to possess carcinogenic or mutagenic properties, or properties which may affect steroidogenic, thyroid, reproduction or other endocrine-related functions in or through 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 (particularly 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.).

Substances listed in Annex VIII of the WFD

Much work is already underway to prevent the pollution of surface waters by hazardous substances. A list of hazardous substances has already been established at EU level and criteria for identifying such substances provided by the new EU chemicals regulation (REACH). It seems unlikely that Member States would deviate for substances already identified. However,, given that groundwater is a little understood environmental medium, it is likely that substances not considered to be hazardous under surface conditions (because they break down through sunlight, biological action, etc.) might be qualified as hazardous by a national authority, which would then be required to take action to prevent inputs.

As a starting point, Member States are required to continue work in implementing the 1980 Groundwater Directive, but must consider the increased reporting and transparency requirements.

Criteria for the definition of good chemical status – Article 3

EU-wide common quality standards for nitrates and pesticides (*Quality Standards*)

The new GWD introduces common chemical quality standards for all groundwater bodies. For pesticides, the standard is 0.1 microgram per litre for an individual substance, and the total for all pesticides present is 0.5 micrograms per litre. These standards explicitly include metabolites, or reaction products, of pesticides. The new GWD enables Member States to

establish stricter standards like those for drinking water, provided that the a certain area, or the whole area, is designated a safeguard zone.

The Directive also establishes a quality standard for nitrates of 50 milligrams per litre) in all groundwater bodies. This is in contrast to existing nitrates legislation which gives Member States some flexibility in defining Nitrates Vulnerable Zones.

For both pollutants, Member States must introduce stricter national standards (threshold values) if the EU standards are too high and would cause associated surface waters to fail their relevant WFD objectives, or groundwater-dependent terrestrial ecosystems are likely to be significantly damaged.

Common provisions for national quality standards (*Threshold Values*)

By December 2008, Member States must establish threshold values for at least nine pollutants and one indicator of intrusion,. They must also introduce standards for further pollutants in accordance with a certain criteria catalogue provided in Annex II A of the new Directive (eg. human and eco-toxicological criteria). The Commission must publish a report up to 22 December 2009 informing about these threshold values.

1. Substances, ions, or indicators which may occur both naturally and/or 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 ⁸
Conductivity

Minimum list of pollutants for which threshold values must be established

Compliance – when does failure result in Bad Status classification? – Article 4

Both quality standards and threshold values must be applied on each monitoring point. However exceedance **does not** automatically trigger a failure or cause the water body to be reported as Bad Status. Instead, failure triggers an investigation of whether the conditions for Good Groundwater Chemical Status laid out in Table 2.3.2 of the WFD’s Annex II are being met.

This system therefore largely depends on i) the number of monitoring points, for which the Directive does not provide clear specifications, and ii) the detail and robustness of any investigation into the damage caused to surface waters and wetlands by groundwater pollution..

⁸ Regarding saline concentrations resulting from human activities, Member States may decide to establish threshold values either for sulphate and chloride or for conductivity.

Trend assessment and reversal

The baseline for trend assessment is defined for 2007 and 2008 where relevant, or additional data must be collected for the assessment. Data collection is subsequently coordinated with the monitoring scheme for all water bodies as required by WFD. The starting point for trend reversal must generally be established at a point when a statistical and environmental significant upward trend of pollutant concentration within a groundwater body is identified. Measures to reverse trends should be introduced when concentrations reach 75 per cent of the relevant quality standard or threshold value although provisions are made to act earlier or, indeed, delay action. The first trend identification under the new GWD must take place in 2009.

Protection of Drinking Water Resources

Article 7 of the WFD applies, which requires Member States to avoid groundwater quality deterioration so as to reduce the level of purification treatment required in drinking water production.

Revision clause

To ensure the consideration of new findings, e.g. concerning relevant new pollutants, distortions resulting from different threshold values in Member States or regarding groundwater ecosystems, the Directive introduces a regular revision clause. An initial revision phase is planned for 2013 and every six years thereafter. Environmental organisations are also explicitly granted the right to participate in this process. One crucial objective of the revision is to prove whether to amend the list of quality standards or the list of pollutants for threshold values. The Directive requires a co-decision procedure, particularly for reduction of the pollutant list.

3.5. Assessment

The new Groundwater Directive represents a second chance for groundwater protection. It presents a mixed bag of measures, some more stringent than existing regulations, and others weaker. But in times of a growing awareness of the failure to apply existing EU environmental protection rules, the new GWD offers potential improvements to protection, mainly through increased reporting, public participation and economic appraisal requirements introduced by the WFD. Most importantly, the new GWD reinstates a clear and legally-enforceable obligation to prevent the input of hazardous chemicals into groundwater. This underlines the fact that the EU does not accept these chemicals should be present in groundwater and thus recognises the intrinsic value of unpolluted groundwater and the importance of applying the precautionary approach when protecting such a vulnerable resource.

Weaknesses

The new GWD is complex and hence not always clear. This creates a risk of inconsistent application between Member States. Crucially, legislators have missed an opportunity to harmonise groundwater protection with Europe's emerging chemical risk management policies and the WFD's existing controls and listing procedure for hazardous substance. By devolving much of the decision-making to Member States the new GWD fails to provide a substantive and effective EU strategy at for preventing and limiting the input of pollutants into groundwater. The effective prevention and limitation of pollutant inputs is necessary to protect groundwater in its own right and ensure achievement of the WFD objectives of 'no-deterioration' and 'good status'. National WFD implementation reports from 2004 have demonstrated that without additional measures, most of our groundwater bodies would not meet quality standards.

The new GWD also introduces new, unclear exemptions to prevent and limit obligation e.g. the text dealing with the input of pollutants into groundwater from diffuse sources. This lack of clarity is open to abuse and could lead some countries to offer a blanket exemption to all diffuse sources of groundwater pollution from stringent prevention controls.

The new GWD also exempts 'river maintenance' activities from a pollution prevention obligation. This clause was inserted following pressure from the Dutch Government, which has allegedly authorised illegal disposal of dredging material in the past few years. They now wish to bring the activity within the scope of the law. There is concern however that other countries will be encouraged to apply the exemption in order to relax environmental standards or justify and maintain plans and measures for modifying rivers and waterways.

Other types of pollutants, more or less precisely defined in WFD Art. 2 (33) (e.g. thermal pollution or carbon dioxide pollution), are not covered clearly or strictly enough by the 'prevent and limit' approach. There is also no clear definition of deterioration, particularly with reference to alteration within class borders.

There are also few quality standards to define good status and, regarding nitrates, the standard set already represents an excessive level of pollution. The NGOs recommended a 25 mg per litre as a more appropriate EU standard.

The vague requirements for monitoring and status classification risk allowing 'bad' monitoring results to be concealed, by averaging them with other monitoring points over large groundwater bodies, or simply not monitoring where pollution occurs. Even where standards or threshold values have been exceeded, there is huge uncertainty over the quality of any subsequent *investigation* giving Member States another opportunity to discount water quality failure and report the water body as *Good Status*.

Regarding the new GWD's trend reversal obligation, the Directive does not clarify what has already been set out by the WFD, instead it introduces an exemption by allowing trend reversal measures to start above 75 per cent of the relevant quality standard or threshold.

Strengths

Despite all of the challenges, the new GWD gives a strong signal for continuing and further strengthening of groundwater protection:

Groundwater protection must be protected in its own right and the demands of groundwater ecosystems must be identified and considered.

The legal obligations require understanding and investigation of the inter-connectivity of ground and surface waters, which has great potential to improve sustainability groundwater management.

The requirement to prevent any input of hazardous substances into groundwater has been maintained and combined with new reporting and public participation obligations could become much more powerful than it has been over the last 25 years.

4. Outlook and NGO actions

The new GWD basically reconfirms the validity of the old ‘prevent and limit’ approach, but introduces some new flexibility for Member States, so how can this result in progress? In 2000, Europe completely reshaped its water management rules by adopting the Water Framework Directive. This introduced a holistic ecosystem-based protection approach requiring a completely new understanding of groundwater as an important element of the aquatic ecosystem, which cannot successfully be managed in isolation. The WFD introduced new concepts, like water pricing, increased transparency, reporting and greater rights for citizens and their organisations to participate in developing river basin management plans.

This means that in future it will be harder for Member States to escape public, legal and EU-wide scrutiny of what is or isn’t done, nationally or regionally: this could mean more effective implementation and achievement of objectives in future. But to get there, it is vital for environmentalists and authorities to understand both the new GWD and the WFD and use them in the best way to achieve environmental objectives rather than simply adopting a minimalist approach to satisfy EU reporting requirements.

We therefore recommend the following priority actions:

1. Integration with WFD, Soil Protection and Chemical Risk Management

The new GWD can only work if it is fully integrated with WFD implementation. Without integration there would be huge duplication of effort, waste of public money and most likely lousy environmental outcomes. In addition the forthcoming *Soil Directive*, and *Priority Substances Directive* and *Thematic Strategies for Pesticide Use* all offer further opportunities to implement the prevention approach provided in the GWD.

More specifically, the *Thematic Strategies for Pesticide Use* must ensure that pesticides which found in groundwater are withdrawn from the market and that, generally, farmers become less dependent on pesticide use. All these legislative acts are in the pipeline and efforts should be made to improve them so that they take groundwater protection objectives into account.

2. EU guidelines clarifying unclear provisions

Under the Common WFD implementation strategy (CIS), guidance will be compiled regarding the groundwater monitoring and pollution prevention obligations. Both guidance documents are due to be finalised within a year. Although these guidelines are not binding, they are useful in clarifying the new GWD and restrict unclear provisions. Specifically, the guideline must address the risk of non-comparability of monitoring schemes across Member States in order to avoid analysis hiding groundwater pollution ‘hot-spots’. In particular, more effort needs to be put into understanding groundwater and groundwater-dependent ecosystems so as to develop a robust ecosystem-based groundwater protection approach in the future.

3. Prevention of pollution

Member States must draw up a list of pollutants for which an effective and transparent control regime should be established. Measures should address all relevant sectors, setting clear targets, and use annual mass-balances as indicator and apply restrictions on the use and marketing of such pollutants EU-wide and/or nationally. Substitution plans should be developed for hazardous substances in order to replace them swiftly with safer alternatives or technologies. The EU Directive on *Integrated Pollution Prevention and Control* (IPPC) must be fully implemented ensuring the phase-out/zero emission of hazardous substances. Groundwater hazardous substances used by *Small and Medium Sized Business* or in

construction materials not covered by the IPPC Directive should be replaced as quickly as possible.

4. Making Polluters Pay

One of the most powerful instruments to protect the environment is making the polluter pay for the damage he causes. Article 5.1 of the WFD requires countries to make an economic assessment of water uses by 2004. This analysis should allow Member States to determine who pays for what, including environmental and resource costs, and assess whether the current economic structure contributes to sustainable water management. Article 9 of the WFD then requires that countries establish water pricing policies by 2010, ensuring that water users pay an adequate contribution to the costs arising from their use.

Unfortunately, most countries have failed to address environmental concerns in the economic assessments they have submitted. This hinders informed choice about environmental measures' cost-effectiveness. It also prevents them from creating sound financing mechanisms to support the environment, through water pricing or abolishing subsidies. European citizens will foot the bill for inefficient policies, through higher water bills and taxes, or by suffering from the consequences of a ruined aquatic environment. This needs to be urgently corrected before the draft River Basin Management Plans under the WFD are produced by the end of 2008.

“The cost of nitrate reduction lies in the range of €50-150 per hectare per year, but this is estimated to be five to ten times cheaper than removing nitrates from polluted water. A 2002 study estimates that denitrification of UK drinking water costs £19 million a year and projects the total UK cost of achieving the European Union nitrate standard for potable water at £199 million over the next 20 years. Consumers, rather than the polluters (i.e. farmers), pay almost all of the bill.” (European Environment Agency, Environmental Signals 2004)

The European Environmental Bureau (EEB) is a federation of 150 environmental citizens' organisations based in all EU Member States and Accession Countries, and several neighbouring countries. These organisations range from local and national, to European and international. The aim of the EEB is to protect and improve Europe's environment and enable citizens to play their part in achieving that goal. The EEB office in Brussels was established in 1974 to provide a focal point for its members to monitor and respond to emerging EU environmental policy. It has an information service, runs working groups of EEB members, produces position papers on topics that are, or should be, on the EU agenda, and represents members in discussions with the Commission, the European Parliament and the Council. It closely coordinates EU-oriented activities with its members at national level, and also closely follows the EU enlargement and certain pan-European issues.

The German branch of Friends of the Earth, Bund für Umwelt und Naturschutz Deutschland (BUND), was founded in 1975 as a federation of pre-existing regional groups. Some local branches date back to 1913. BUND has its origins in the nature conservation movement. Today, the organisation is one of the most influential environmental organisations in Germany. BUND has 390,000 members and supporters. Members are active in some 2,200 local and regional groups, involved with everything from lobbying work to practical nature conservation. BUND works on all of today's major environmental issues (e.g. climate policy, healthy food and responsible animal husbandry, biodiversity and sustainable water policy, sustainable transport policy).

The Royal Society for the Protection of Birds (RSPB) is the UK charity working to secure a healthy environment for birds and wildlife, helping to create a better world for us all.

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