

Water Framework Directive (WFD): Note from the UK administrations on the next steps of Characterisation



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Aim

The UK Government and its agencies have recently undertaken an analysis of the characteristics of all surface water (rivers, lakes, estuaries, coasts) and groundwater bodies as part the implementation of the EC *Water Framework Directive* (WFD). The draft results of this analysis have been shared with stakeholders and the wider public for comment and feedback. This initial characterisation was completed for each River Basin District in accordance with Article 5 of the Directive by 22 December 2004 and the UK Government has formally reported the summary results this month to the European Commission. This note sets out how this initial characterisation of our waters will be refined over the coming years.

WFD – the challenge

The *Water Framework Directive* (WFD) requires member states to identify the extent and characteristics of water bodies (a process called “characterisation”) and carry out an initial risk assessment of those waters which takes into account the impact on aquatic ecosystems of a much wider range of pressures than previously considered.

The Government and its agencies have until now been using largely chemical water parameters (together with a biological parameter relating to invertebrates) in assessing the overall quality of our rivers, lakes and estuaries. These have formed the basis of the annual announcements on water quality which have shown a steady improvement in rivers and coastal waters since 1990. This reflects the significant investment made over recent years to tackle point source water pollution, particularly from sewage works.

However, the *Water Framework Directive* sets environmental objectives for the whole aquatic ecosystem. They are therefore much broader than the objectives of previous water Directives. This is because the *Water Framework Directive* requires surface waters to meet ‘good ecological and chemical status’ and groundwaters to meet ‘good chemical and quantitative status’ by 2015. Those surface waters which are subsequently identified as Heavily Modified Water Bodies (HMWB) and Artificial Water Bodies (AWBs) must achieve ‘good ecological potential’ by 2015 (recognising that changes to morphology may make good ecological status very difficult to meet). In addition the WFD also requires that no deterioration in water status takes place and that protected area (established under existing community legislation) objectives are met.

This shift from largely chemical standards to ecological as well as chemical standards means that any activities that lead to biological changes eg. morphological impacts (altering the physical shape of water bodies), changes in rates or volumes of flow (eg. physical structures in the river channel or abstraction) or the introduction of alien species must be taken into account. Activities and practices that lead to diffuse water pollution (both urban and rural) will also need to be tackled if we are to improve our waters to meet the environmental objectives of the Directive.

River Basin Characterisation – Initial Stage (2003-4)

The initial stage of characterisation (required to be completed by the end of 2004) involves dividing most of the UK's waters into 'water bodies' which are the core units of management under the WFD. The physical and chemical nature of these 'water bodies' are then described and for surface waters they are grouped together into types. The outcome of this process is a 'typology'. There is no typology system required for groundwaters.

The next step is the assessment of pressures and impacts on these water bodies. This assessment allows the identification of those water bodies which are at risk of failing to meet relevant WFD objectives. For surface waters, the objectives are to aim to achieve 'good ecological status' and 'good chemical status', and for Heavily Modified Water Bodies/Artificial Water Bodies 'good ecological potential' and 'good surface water chemical status' by 2015. For protected areas, the objectives and standards are those contained within community legislation that establishes the protected areas. There is also a 'no deterioration' objective for all water bodies. For groundwaters the objectives are 'good chemical status' and 'good quantitative status', with a requirement for no deterioration in status and the implementation of measures to reverse significant and sustained upward pollutant trends.

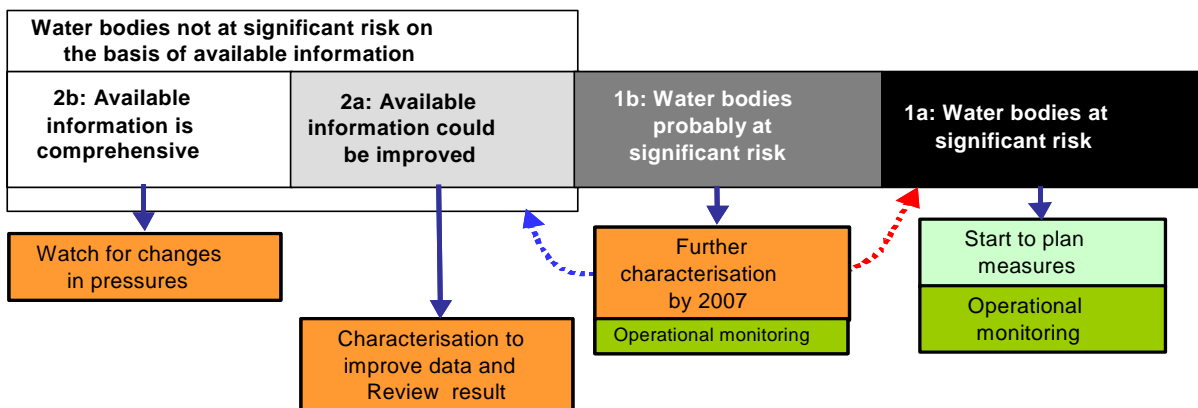
The assessment must also take into account whether protected area objectives will be met by 2015 as far as possible. Registers of protected areas were established at the end of 2004. These include those designations made under the Article 7 of the WFD (Drinking Water Protected Areas), *Freshwater Fish Directive*, *Shellfish Directive*, *Bathing Water Directive*, *Nitrates Directive*, *Urban Waste Water Treatment Directive* and water dependent sites established under the *Birds and Habitat Directives* (Natura 2000 network sites).

The results of this initial risk analysis will be used both to prioritise our future environmental monitoring (which will be operational by end 2006) and to identify those water bodies and protected areas where action to improve the status of the water environment or meet protected area objectives may be required in the first planning round.

We have reported to the Commission in March 2005 which of our water bodies have initially been assessed as ‘at risk’ or ‘not at risk’ of failing to meet the environmental objectives of the Directive by 2015. This will help the environment agencies target their monitoring regimes in the next immediate phase of characterisation and identify what actions may be needed immediately. We have also indicated in the reports where we have a high degree of uncertainty with our current assessment (eg due to lack of data) by having two further categories of ‘probably at risk’ and ‘probably not at risk’. These four categories are shown below. The diagram also shows how we plan to use the risk categories to prioritise different types of monitoring to increase our confidence in the assessment and fill in any data gaps.

Characterisation will be an ongoing process subject to revision as the monitoring systems required by the WFD are established and start to yield further information on our waters. In the case of surface waters, the results of the EU intercalibration process will obviously influence the revision (this process establishes where ‘good status’ lies for the ecological parameters of the Directive across the EU). In the case of groundwater, revisions will be required when the outcome of the proposed *Groundwater Daughter Directive* is known. Similar revisions will be required once the daughter directive on priority substances and the revised *Bathing Water Directive* are adopted. The EU Common Implementation Strategy (CIS) establishes a common framework in which to do this across member states to ensure a ‘level playing field’.

Diagram showing UK risk assessment categories and follow-up action



The following pressure categories have been considered in initial characterisation for their impacts on water bodies:

- **point source pollution** – for example effluent from waste water treatment works and industrial discharges;
- **diffuse source pollution** – for example run off from farmland, urban areas and acid rain;

- **abstraction and flow regulation** – for example abstractions for manufacturing processes such as distilling and food processing; regulation of water in order to produce hydropower or for navigational purposes;
- **morphological alteration** – for example land claim for ports or housing, structures for flood and coastal protection, river straightening for agricultural purposes;
- **alien (invasive) species.**

Why do we need a refinement of characterisation? What are the benefits?

The following points should be taken into account when considering the results of initial characterisation and suggest the need for a further refinement of characterisation from 2005-2007:

1. It is an initial risk assessment and not classification. The initial characterisation results should not be interpreted as a measure of how good or bad our waters actually are, but rather a first indication of what and where we think the pressures and impacts affecting the water environment may be. It is not a comprehensive measure of the current ecological status of water bodies or protected areas.

The results should be used to steer the development of targeted and efficient monitoring during 2005-2007, and to build up the further information about the pressures, impacts and the economic aspects of water uses. This is necessary for the development of measures and comparison of their likely effectiveness to support the achievement of WFD objectives. Until WFD monitoring is fully established (2006/7) the way in which the Government assesses overall river water quality (through for example the General Quality Assessment network in England and Wales, or the Classification Network in Scotland) is likely to remain unchanged. As the WFD monitoring results become established it is likely that they will be used to show overall water status trends nationally. For instance in England, these will eventually replace General Quality Assessment results as the most reliable measure of the status of our water environment. For groundwater the monitoring results will give the first national assessment of water quality.

2. It is based on an estimation of where good status lies. The Directive sets out normative definitions of what good status is for each surface water category (ie. rivers, lakes, coasts) but the exact boundary between high-good and good-moderate ecological status will not be defined at EU level until the intercalibration of biological classifications is complete at the end of 2006. It should be noted that it is likely that intercalibration will only deliver in 2006 for a very limited range of biological parameters. Many biological monitoring methods for WFD are still in development and will not be included in the 2006 intercalibration. This process is vital in standardising good status targets across

the EU and ensuring a 'level playing field'. Once this is undertaken Member States will then formally classify waters. Further characterisation will need to take account of any outcomes from the EU intercalibration exercise in time for the first river basin plans in 2008/9.

For groundwater, one element ("relevant standards") of the definition of good chemical status is incomplete and awaits the outcome of the proposed *Groundwater Daughter Directive*.

3. There is a large amount of uncertainty in our current knowledge of water status. No assessment of waters has taken place on this scale before. That said, the 2004 risk assessments are based mainly on datasets readily available to the environment agencies at the current time and also rely heavily on modelling. In most cases validation of the assessments has not been possible through site visits. There remain significant gaps in our knowledge of the pressures and impacts on some of our waters and a broadly precautionary approach has been adopted in making the assessments. This is why in the UK we have adopted four risk assessment categories to reflect different levels of certainty in the results: 'at risk significant risk', 'probably at significant risk', 'probably not at significant risk', 'not at significant risk'.

These knowledge gaps will be filled by targeted monitoring programmes during the next phase of characterisation that will be focused on those waters where we know there is a significant pressure/impact (to ascertain the extent and cause(s) of the pressure/impact) and where there is a lack of data (to ascertain more conclusively whether there is a pressure/impact or not). We will also need to be sure of the true status of our waters before we formally classify them from 2007.

4. Some of the risk assessments assume no improvements or deterioration will take place in water status until 2015 ie. no trends are built in. Some risk assessments in the initial characterisation assumed the status quo from when the latest datasets are available (2002-2004) until 2015. However, where possible trends e.g. in water company investment and water demand/abstraction have been factored into the analysis. We have clearly stated in the summary reports where these trend scenarios have been built into the risk assessments. The next phase of characterisation will need to take better account of other trends and so better inform the development of programmes of measures.

5. Surface water bodies are largely defined by their typology and groundwater bodies based on hydraulic units. These are not necessarily the most appropriate units for managing pressures.

Most surface water bodies were defined by the typologies, which are based on natural characteristics. Information on pressures was taken into account where appropriate. Due to the need to describe both quantitative and chemical status,

most groundwater bodies have been defined as hydraulically distinct units. The water bodies are the spatial units for the pressure and impact assessments, and will also be the units by which objectives are set. Water bodies do not currently cover all waters in the UK and their boundaries may not be the most appropriate in relation to classification and monitoring. It will be necessary to review water body delineation to determine whether further water bodies should be identified or whether water bodies should be grouped or split for better management. The next phase of characterisation will review current water bodies in the light of monitoring data and proposed management actions to determine whether re-delineation is required to better set objectives and manage the waters.

6. Refinement of characterisation will lead to a more accurate assessment and therefore better focussed and more effective measures.

This continued refinement should lead to greater certainty as to which water bodies are 'at risk' of not meeting the environmental objectives of the Directive by 2015, and so enable the monitoring programmes and the programmes of measures (the measures required to ensure that the Directive's objectives are met) to be correctly targeted and be as cost-effective as possible.

These 'programmes of measures' will be summarised in the 'river basin management plans' which will be finalised and approved by Ministers in 2009. The river basin management plan (prepared for each River Basin District in the UK) and the environmental objectives and the programmes of measures summarised in them will be subject to consultation with the general public and those parties that have an interest in the water environment. Programmes of Measures have to become operational by 2012 in order to achieve the Directives' objectives by 2015.

Greater certainty of the nature and extent of key pressures and impacts by 2007 is also vital if we are to justify cases for designating water bodies as heavily modified or artificial, and cases for exemptions from the Directive's objectives. A limited range of exemptions (for example, setting a less stringent objective, extending the 2015 deadline by up to 12 years, temporary deterioration as a result of force majeure, and changes as a result of new physical modifications and sustainable human development activities) are permitted by the Directive provided the necessary conditions are met. The conditions are different for each exemption but they include consideration of whether the measures required to meet the Directive's objectives are technically feasible or disproportionately costly, and requirements for the prevention and mitigation of adverse impacts. Assessments of whether these conditions are being met will need to be based on detailed information on pressures and impacts.

Further information about the nature and extent of pressures and impacts is also essential when considering the case for and against amendments to regulatory powers and controls. We need to have a clear picture of the scope, scale and

nature of the problem which needs to be addressed in order to decide whether regulatory change is necessary and appropriate.

Further characterisation (2005-2007) – what will it involve?

The risk assessment undertaken in 2004 was the first stage of the process set out in the Directive (based largely on readily available existing datasets but with a fair amount of uncertainty). The next phase of characterisation (2005-2007) will lead to a refinement of the risk assessment as new data and monitoring increases our certainty as to what pressures and impacts are operating on water bodies. This will inform the publishing of the report on the 'interim overview of the significant water management issues' required for each river basin district in 2007.

Refinement of characterisation will include or take into account the following:

- establishment of a formal WFD monitoring regime by end of 2006 which will improve our knowledge of water status and of the pressures acting on the water environment ;
- further existing datasets will be used (including those of third parties, where relevant) and new ones developed;
- identification and listing of further significant groundwater-dependent wetlands;
- identification and characterisation of further important smaller water bodies, which fell below the size or priority thresholds during initial characterisation¹. These could include waters of significance for biodiversity of both EU and UK importance;
- merger or subdivision of water bodies to improve the management of their water status;
- the outcome of the EU intercalibration exercise which will formally define where 'good status' lies (although by the end of 2006 this may only be completed for a limited number of ecological parameters);
- the outcome of the daughter directives on groundwater and priority substances and the revised *Bathing Water Directive*;
- better data on economic trends in River Basin Districts to determine risk of non-achievement of WFD objectives by 2015;
- continued stakeholder involvement in characterisation work eg. stakeholder workshops, consultations, bilateral meetings.

As a result further characterisation may lead to:

- the proportion of water bodies identified as being 'at risk' changing during 2005-2007;

¹ in accordance with UKTAG Guidance on the identification of small surface water bodies (July 2003)

- the proportion of water bodies in the 1b 'probably at risk' category decreasing, whilst those in the 1a 'at significant risk' or 2b 'not at significant risk' categories increasing as extra monitoring improves our confidence in the status of those waters;
- changes in our assessment of the relative contributions of the different pressures to the attainment of the environmental objectives of the WFD.

Links between economic analysis and characterisation

The economic analysis required by the WFD, the first stage of which has been completed in parallel to the pressure and impact assessment, will be integrated to help us predict what the likely socio-economic trends are in the coming years and how this will affect the activities and resulting pressures on water bodies within each River Basin District. This in turn helps inform the best combination of measures to ensure that the environmental objectives of the Directive are met.

Work is already starting on how to build cost effectiveness into the planning process to ensure that the least cost is incurred for maximum effect. This is essential if we are to make a case where we are unable to pursue the best environmental option due to 'disproportionate cost'. The consideration of economics is also vital if we are to assess the true potential benefits of the WFD to society and the environment.

River Basin Characterisation is a continuing and iterative process (6 year cycle)

The UK Administrations believe that refinement of the initial characterisation exercise is essential between 2005 and 2007 in order to inform the proper development of river basin management plans (RBMPs) and cost-effective programmes of measures that allow us to meet the requirements of the Directive.

The Directive itself requires that a further formal round of river basin characterisation takes place in 2013 to inform the development/refinement of programmes of measures in the second round of RBMPs that will be developed by 2015. Further rounds of characterisation will then take place on a 6 year basis (ie. 2013, 2019, 2025) which in turn inform the future cycles of RBMPs that also take place on a 6 year interval (ie, 2015, 2021, 2027).

Stakeholders and the wider public will continue to be involved throughout this process.

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