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The European Water Framework Directive: An Approach to Integrated River Basin Management

Abstract

The Water Framework Directive is the most significant piece of European water legislation for over twenty years. It will update most of the existing water legislation in Europe and was a feature of the key water initiative at the World Summit in Johannesburg in August. The concepts of river basin management have been central to the approach taken by the UK Government, the Environment Agency, the UK water industry and its predecessors. The paper will review the key principles of the Directive, its implementation in the UK and its applicability to other international river basins.

1. Introduction

The UK has seen considerable improvements in water quality over the past twenty years. This has been the result of significant investment by all industrial sectors, particularly the water industry and follows a number of policy initiatives to improve water quality. Policy changes have been instigated either directly by the UK government or in response to wider European legislative change. Strong regulation by the Environment Agency and its predecessor bodies has ensured that the legislation has been enacted and that the attitude of industry towards the environment has changed. Regulatory pressure, both environmental and economic has been a major factor for change in the water industry and the other privatised utilities in the UK.

Most water quality improvements in the UK have followed a river basin management approach to environmental planning and regulation. This has focussed on setting quality objectives necessary to protect the water environment and the uses required by society. This includes the protection of drinking water supplies, recreational uses, industrial and agricultural abstraction and discharge. Permits to abstract water and discharge treated effluent are then set to reflect the needs of the river basin. In this way investment can be focussed on known environmental outcomes.

European Community legislation is becoming increasingly important in member states and is now the major policy influence on water quality in the UK. The European Union (EU) Water Framework Directive is the latest and most far-reaching piece of European environmental legislation to date. It consolidates and modernises much of the earlier EU water legislation and will extend the concepts of river basin management to the whole of Europe. It builds on other environmental regulation and advocates a combined approach to pollution prevention and control. In this respect it integrates with the EU Integrated Pollution Prevention and Control Directive³ which is a



key regulatory initiative controlling emissions from major industrial sectors to all environmental media and the Urban Waste Water Treatment Directive²⁰ which sets minimum standards of treatment for sewerage systems and sewage treatment works.

UK has been instrumental in the development of the Water Framework Directive with other key European partners and has considerable expertise in the key technical aspects of the Directive. However, all member states recognise that the Directive is ambitious and will set demanding environmental quality targets for Europe to achieve over the next 20 years. It will require significant changes in our approach to environmental planning and regulation and will push forward our understanding of the factors affecting ecological quality and the behaviour of water within catchments.

The application of these principles to the larger multi-national river basins, such as the Danube and the Rhine, will require co-operation between countries and the development of political as well as technical solutions. Voluntary initiatives have been in place for some time on the Danube and the Rhine and some progress has been made. However, comprehensive river basin management on this scale is a new challenge and for the first time it will have legislative backing from all EU member states.

It may be possible to draw lessons from this European initiative that could be appropriate to other river basins across the world. To this end the European Commission has been invited to make presentations on the Water Framework Directive at the World Summit in Johannesburg in 2002, as a possible model for water quality improvement.

This paper will look in some detail at the approaches to river basin management taken in the Directive.

2. Current Status of the Directive

The Water Framework Directive (WFD) came into force with its publication in the Official Journal of the European Commission on December 22nd 2000¹. The UK now has three years to bring into force the necessary provisions to comply with the requirements of this significant piece of legislation. The UK government has initiated this process by issuing the first consultation paper on the implementation of the Directive at the end of March 2001. A second government consultation paper is scheduled for September 2002.

The Environment Agency published a technical consultation paper in June 2002² examining the issues relating to the technical requirements of the Directive. Significant work is underway to secure the technical knowledge and guidance necessary to implement the Directive.



3. Outline of the Directive

3.1 Objectives and Key Elements of the Water Framework Directive

The Directive introduces an integrated and co-ordinated approach to, and represents an important step forward for, water management in Europe. It rationalises and updates existing water legislation by setting common EU wide objectives for water.

Its key objectives, as set out in Article 1 are to:

- prevent further deterioration and protects and enhances the status of aquatic ecosystems and associated wetlands;
- promotes sustainable water use based on long term protection of available water resources;
- aims at enhanced protection and improvement of the aquatic environment;
- ensures the progressive reduction of pollution of groundwater and prevents its further pollution, and
- contributes to mitigating the effects of floods and droughts.

The aim of the Directive is to take a holistic approach to water management, as water flows through a catchment from lakes, rivers and groundwaters towards estuaries and thence the sea. Surface and groundwater are to be considered together, in both qualitative and quantitative terms.

The overriding objective of the Directive, as set out in Article 4, is that Member States will be required to achieve "good surface water status" and "good groundwater status", and also to prevent deterioration in the quality of those waters, which are already "good". The major change of approach in this Directive is that ecological quality is a key means by which, surface waters in particular, will be assessed against "good status" as well as the more traditional assessment of chemical quality.

There will be limited exceptions to, or derogation from, achieving these objectives. In particular bodies of water which are artificial in construction or where the physical structure has been irrevocably and heavily modified will be required to achieve a status of "good ecological potential". This status is equivalent to achieving good status given the constraints of the physical structure of the water body. Derogation from "good status" is also allowed in unforeseen or exceptional circumstances, such as floods or droughts. In these circumstances Member States must take "any practical means" to restore the waterbody to its previous status.

The Directive also provides for protection to higher standards through the designation of Protected Areas, for example for water supply, recreational waters, nutrient sensitive waters or nature conservation or economically important aquatic species.

These improvements in water status are to be achieved through a system of analysis and planning based upon the river basin, called River Basin Management Planning (RBMP). RBMP is the key administrative mechanism identified in Article 13 of the Directive for the delivery of environmental objectives. This approach accords closely with the Environment Agency's established



practice in England and Wales; in particular the current practice of catchment management planning will provide an excellent basis for the development of the River Basin Management Plans (RBPs) required by the Directive. These RBPs set out a Programme of Measures for the achievement "Good Status" and are to be subject to public consultation, thus introducing an element of social participation and transparency.

Economic considerations are also an important element of the Directive; Article 9 requires Member States to take account of the principle of recovery of the costs of water services, and to make judgements about the most cost effective combination of measures in respect of water use.

The Directive includes new provisions to regulate pollution from Dangerous Substances. These provisions include the establishment of a Combined Approach, which permits the use of both Environmental Quality Standards and fixed Emission Limit Values.

The WFD will replace a number of the existing water quality Directives which form an important constituent of current UK water management practice and for which the Agency is a Competent Authority, for example those concerning Surface Water Abstraction⁴, Freshwater Fisheries⁵, Shellfish Waters⁶, Groundwater⁷, and Dangerous Substances⁸. The repeal of these existing European Directives and Decisions under Article 21 will be phased to ensure that at least the same level of protection is afforded to water quality.

3.2 Scope of the Directive

The provisions of the WFD will apply to all inland surface waters, ground waters, transitional water (including estuaries and coastal lagoons) and coastal waters (to one nautical mile from the baseline). The WFD prescribes an objective based approach to drive improvements and maintain current status. An important benefit of these objectives is that they integrate water quality and water quantity issues for surface and ground waters.

3.3 Surface Water Status

Surface Water Status is assessed using two components; Ecological Status and Chemical (pollutant) Status.

3.3.1 - Chemical Status

Under the WFD, European wide Environmental Quality Standards will be set for a "priority list" of substances, which will have been chosen on the basis of the risk that they present to the aquatic environment. To achieve "Good Chemical Status", these European EQSs must be met.

The "Priority List"

The Dangerous Substances Directive⁸ will be repealed under the Water Framework Directive. However, similar provisions to those in the Dangerous Substances Directive are made in the WFD. These revised Dangerous Substances provisions will introduce:



- A Combined Approach, whereby there will be a requirement for Member States to apply both European wide EQSs and Emission Limit Values, as opposed to the Parallel approach under 76/464/EEC⁸ which left the choice with the Member State;
- A “de minimus” provision; and
- A procedure for the specification of the 'priority list' to initially augment, and then replace 76/464/EEC⁸ List 1 substances.

The initial proposals for the "priority list" have been derived for the Commission by the Fraunhofer Institute (Germany). It has been established based on a simplified risk assessment. The risk assessment is based on a combination of monitoring data, intrinsic properties of the substances and use patterns (as assessed by modelling).

3.3.3 - Ecological Status

The exact definition of Ecological Status is provided in Annex V of the Directive. It will be assessed by considering biological, hydromorphological, and physico-chemical elements of quality.

Biological Parameters

Natural ecological variability does not allow absolute biological standards to be established for implementation across the EU. It is proposed that biological quality be judged on the basis of the degree of deviation of the observed conditions from those that would be expected in the absence of significant anthropogenic influence (high ecological status). The WFD includes procedures that will enable this point to be identified for a given body of water, and a system for ensuring comparability between the differing biological monitoring systems used within each Member State.

The biological elements for most of the water body types considered include aquatic flora (macrophytes and diatoms), macroinvertebrates, and fish.

Hydromorphological Parameters

The Directive specifies that Member States must assess the hydrological and morphological condition of water bodies. Although the Directive will not set standards for these elements as such, it will require Member States to monitor and manage the hydromorphological state of the water body in such a way as to ensure conditions consistent with the survival and reproduction of the biota associated with good biological quality.

Physico-Chemical Parameters

The physico-chemical aspects of ecological quality are divided into three parts (Table 1), each of which has different approaches to standards.



Table 1 – Physico-Chemical Parameters.

	Areas of Concern	Standards
General	Temperature, Oxygenation, Salinity, Nutrient Status, Acidification Status	Set by MS to protect biological conditions
Pollutants not on the Priority List	Lower toxicity chemicals - similar to List II substances under 76/464/EEC ⁸	Set according to EU wide protocol specified in Annex V of the proposal.
Priority List Pollutants*	Higher toxicity chemicals - similar to List I substances under 76/464/EEC ⁸	Set according to EU wide protocol specified in Annex V of the proposal

*Priority list pollutants are primarily dealt with under the provisions for Chemical Status as opposed to under this provision (physico-chemical aspects of ecological status). This provision requires Member States to set more stringent standards for priority list pollutants in specific circumstances where the EU standard would be insufficient to protect the ecology of the water body because of the high sensitivity of the constituent organisms to the pollutant concerned.

3.4. Groundwater Status

Groundwater Status is assessed by considering Quantitative Status and Chemical (pollutant) Status.

3.4.1 - Quantitative Status

Of the total annual recharge volume to a groundwater body a portion is needed to achieve the ecological quality objectives for connected surface waters or associated terrestrial systems such as wetlands. The Directive requires that only the volume over and above that required to sustain the surface ecology is available for abstraction.

3.4.2 - Chemical Status

As it is presumed that groundwaters are generally not polluted, the setting of EQSs for groundwaters would give the impression that there is a permitted level of pollution up to which Member States can allow polluting activities to continue. Therefore, a more precautionary approach is taken. There is a prohibition on direct polluting discharges to groundwaters. In addition, there is a requirement to monitor groundwaters in order to detect changes in chemical composition of the groundwater. Any anthropogenically induced significant and sustained upward trend in a pollutant would have to be reversed.

3.5 Conservation Requirements

The Directive's "no deterioration" provisions should prove beneficial for existing sites of high conservation value. Moreover, provisions exist to designate waters as "protected areas" in order to permit a higher level of protection for waters requiring a special level of attention. The level of benefit gained from this provision will depend on its interpretation by Member State administrations. As a minimum Special Protection Areas (SPAs) under the Birds Directive¹⁰, and Special Areas of Conservation (SACs) under the Habitats Directive¹¹ will require designation as Pro-



tected Areas under the WFD. The Directive also allows for, but does not require, the designation of other areas for the protection of habitats and species, e.g. Special Sites of Scientific Interest (SSSI's) where the maintenance or improvement of the status of water is an important factor in their protection.

4. Practical Operation of the Directive - The River Basin Management Planning Cycle

One of the underpinning principles which the WFD adopts is that of integrated river basin management (IRBM). The Directive sets out arrangements for river basin administration and planning, based on, *inter alia*, common objectives for water status, and common monitoring and assessment strategies. The following sections look in more detail at the various components of IRBM detailed in the Directive, and their implications for England and Wales.

4.1 River Basin Districts

The first activity which the WFD requires (Article 3) is that the Member States identify and assign water bodies to River Basin Districts based on hydrological catchments, with coastal and ground waters being assigned to the most appropriate District.

Member States must then appoint a Competent Authority for each of the RBDs to co-ordinate the implementation of the Directive within it. One competent authority may act as a co-ordinating body for other competent authorities, in which case some form of "river basin committee" might be envisaged to act as a focus for management of the basin. The competent authority is responsible for producing the River Basin Management Plan for that basin.

In England and Wales the Environment Agency has functions and geographical boundaries which are compatible with many of the WFD requirements.

4.2 River Basin Management Plans

As Competent Authority the Environment Agency will be responsible for the production of the River Basin Management Plan (RBMP) for that basin. This is the main mechanism of achieving the Directive's environmental objectives within a RBD and as such, there are a wide range of requirements for what is contained in the RBMP:

- Characteristics of the River Basin
- Environmental monitoring data
- Details of the impacts of human activity (e.g. point / diffuse pollution, abstractions, flood defence works)
- Analysis of the economic usage of water
- Strategic plan for the achievement of "good status" – the Programme of Measures



The UK has carried out water management on an river basin planning basis for over twenty years, and during this time a number of different types of water management plans have been developed. Some examples of such plans are given in Table 2. One main difference between many of the existing plans is that RBMPs (and the programme of measures within them) will be statutory. It will therefore be important to obtain as much agreement as possible amongst all parties on whom the Programme of Measures will have an impact.

Table 2 – Existing Water Management Plans in UK

Type of Plan	Bodies Involved	Purpose
Local Environment Agency Plans (LEAPs)	Environment Agency (EA) & many others	Consultation on environmental improvements for a local area
Asset Management Plans (AMP)	Water Companies, Office of Water Services (Ofwat), Agency	Setting out future Water Company investment and determining price limits
Catchment Abstraction Management Strategies (CAMS)	EA, Water Companies	Sustainable use of water resources within a catchment
Shoreline Management Plans	Government department, Maritime Local Authorities, EA	Strategic planning for coastal defence
Coastal Zone Management Plans (CZMP)	Local Authorities, EA, others	Balancing flood defence needs with other coastal activities
Estuary Management Plans (a type of CZMP)	English Nature (EN) / Countryside Council for Wales (CCW), EA, others	Links management of estuaries for conservation with other needs / uses
Water Level Management Plans	EA , EN	Balancing / integrating the water level requirements for a particular inland area.
Habitats Directive – Management Scheme for European Marine Sites	EN/CCW, EA, others	Management of marine Habitats Directive sites
Coastal Habitat Management Plans (CHaMPs)	EA, EN, Government Departments, Centre for Coastal & Marine Sciences, others	Balancing coastal defence needs & Conservation Objectives at Habitats Directive sites.
Biodiversity Action Plans (inc. Habitat & Species Action Plans) / Local Agenda 21 Plans	Many	Implementing Rio Convention & subsequent UK Biodiversity Action Plan - improving Biodiversity



4.3 Analysis of Basin Characteristics

The Directive (Article 5) next requires that an analysis of the River Basins should then be carried out by the Authorities to determine the factors influencing both water quality and water quantity. These analyses would include an assessment of the inherent natural characteristics of each basin, the impact of human activity and the economic usage of water within the basin. The Directive also stipulates that a thorough review of human activities in the River Basin District takes place, including point and diffuse source sources of pollution, abstractions and other human interventions such as flood defence.

The first part of the basin analysis is to identify the location and boundaries of the surface water bodies, and then to categorise them into rivers, lakes, transitional waters (estuaries) or coastal waters. Furthermore a decision must also be made as to which waterbodies are to be designated as artificial or heavily modified.

Having characterised the surface water bodies into rivers, lakes, transitional waters or coastal waters, the next requirement is to discriminate the waterbodies into “types”. This essentially means dividing the waterbodies up on the basis of the physical and chemical factors that determine their characteristics, e.g. geology, climate/rainfall, and hence the biological population and structure. Having derived a series of waterbody “types” it is then necessary to determine what the reference condition is for sites at high ecological status in all of these “types”. This will then provide a reference against which to judge good ecological status for all other waterbodies within the “type”.

As well as characterising the surface waters within a RBD, a similar task needs to be carried out for groundwaters. The main elements of such a characterisation are as follows:

- The location and boundaries of the groundwater bodies,
- Identification of the pressure to which they are subject,
- General characterisation of the overlying strata from which the groundwater receives its discharge,
- Identification of directly dependant surface water systems,
- More detailed information for those groundwaters at risk of failing to meet their environmental objectives, e.g. rates of exchange between the groundwater body and the associated surface water systems.

4.4 Impact of Human Activities

Having characterised the RBD the next task in the planning cycle is to carry out an analysis of the impact of human activity on the waterbodies within that district, and in particular the identification of the pressures that such activities might be causing. This analysis would need to include the impact of point source pollution, for example Sewage Treatment Works for which the Agency has extensive information, and diffuse pollution resulting from land use practice. The Agency is currently developing a series of models which assess the impact of land use on water quality which will assist in this process. Other pressures might arise from the impact of abstractions or physical modifications.



On the basis of the characterisation of the river basin, and the analysis of human impact outlined above, and in line with the criteria in the Directive, the River Basin Authorities are then required to establish the environmental objectives for each water body. For waters not subject to the derogation criteria the objectives are "good status" and to "prevent deterioration" of present status. For waters subject to the derogation criteria interim environmental objectives and deadlines are set which are subject to review. As well as establishing reference conditions for each waterbody type, this will also involve defining "good status", using the framework provided in Annex V of the Directive. Given its fundamental importance to the Directive the definition of "good status" is likely to be intensely scrutinised by a number of parties, from Non Governmental Organisations (NGO's) to representatives of industry and agriculture.

Having derived the environmental objective for each water body, the next task for Competent Authorities is to identify those water bodies at risk of failing to meet these objectives, i.e. where in a RBM is "good status" not likely to be met. Since this analysis has to take place before monitoring programmes are put in place, it is essentially to be carried out on a risk analysis basis. The Directive acknowledges this by allowing such analysis to consider characteristics such as natural variability in biological populations and the natural vulnerability of a waterbody, e.g. groundwater vulnerability maps or information on areas of low flow. Provision is also made for the use of models or other assessment techniques, for example to link to effects of diffuse pollution on biological communities.

After the analysis of those waterbodies at risk of failing to meet their environmental objectives has been completed the information is then to be used to design the monitoring programmes required by the Directive to determine if the objectives are actually being met or not.

4.5 Monitoring

The first deadline in the Directive relating to monitoring is end 2007. By this date, Article 8 of the Directive requires that monitoring programmes have been defined by Member States, and are ready for commencement. The main objectives of such monitoring programmes are as follows:

- To provide a coherent and comprehensive overview of ecological and chemical status,
- To permit the classification of water bodies into five classes; high, good, moderate, poor and bad,
- To be based upon the characterisation and impact assessment carried out for the RBD,
- To cover parameters which are indicative of the status of each relevant quality element.



4.5.1 Groundwaters

For groundwater Member States are required to establish a groundwater monitoring network which will:

- Provide a reliable assessment of quantitative status,
- Provide a coherent and comprehensive overview of chemical status,
- Enable detection of long term anthropogenically induced upward trends in pollutants,
- Support the establishment of both Surveillance and Operational monitoring programmes.

The UK has undertaken systematic observation of groundwater levels and quality since at least the 1950's; indeed an archive of water level measurements, in some cases going back to the last century, is maintained by the British Geological Survey. Historically the network of groundwater monitoring points is based on, or around, abstraction boreholes, usually public supply wells. This reflects the fact that the main historical use of groundwater monitoring data has been in the management of public water supplies.

In recent years there have been developments aimed at producing a strategically based national groundwater monitoring network^{12,13} and the Agency is currently developing a national groundwater monitoring strategy, one of the specific aims of which is to meet the requirements of European legislation, in particular the Water Framework Directive and Nitrates Directive¹⁴, as well as providing relevant information for the European Environment Agency.

4.5.2 Surface Waters

For surface waters three types of monitoring are defined:

i. Surveillance Monitoring.

This is required to be carried out for 1 year in 6, with the aim of validating the impact assessment, assessing long term changes in the RBD, and providing information to inform the design of Operational monitoring programmes.

ii. Operational Monitoring.

This is required to be carried out for 5 years in 5, with the aim of establishing the actual status of those water bodies identified as being a risk of failure to meet their environmental objectives, and assessing the effectiveness of the Programme of Measures.

iii. Investigative Monitoring.

This is to be carried out as required, where the reasons for a failure of the Directive's environmental objectives are unknown or to ascertain the impacts of accidental pollution.

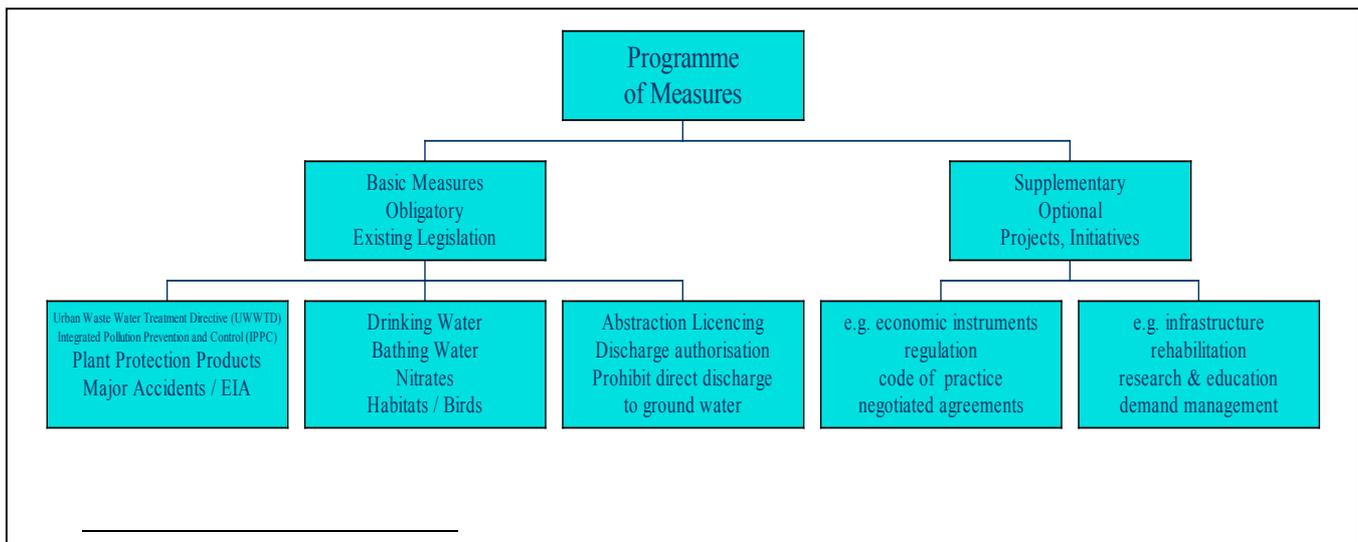


The monitoring of a variety of biological elements is required by the Directive to enable, along with physico-chemical and hydromorphological elements, an overall assessment of ecological status to be made for each surface waterbody. Amongst the biological elements for which monitoring is specified is the composition and abundance of benthic invertebrate fauna and aquatic flora (phytoplankton, phytobenthos and macrophytes), along with the composition, abundance and age structure of fish fauna. Not all waterbody types require the monitoring of all biological elements, for instance fish fauna are excluded from coastal waters.

4.6 Programme of Measures

Having carried out monitoring to determine the status of the water bodies within a RBD, Article 11 requires that competent authorities must then use this information in developing an integrated Programme of Measures to meet the Directive’s environmental objectives, in particular that of “good water status” within the basin. These will be made up of compulsory basic measures which include, *inter alia*, meeting the requirements of other relevant Directives* and the licensing of discharges and abstraction, and where necessary complemented by supplementary measures if the basic measures are not sufficient to meet the environmental objectives. Supplementary measures are set out in an Annex to the Directive as a non-exhaustive list of potential initiatives for improving water status, ranging from economic instruments to negotiated agreements to rehabilitation projects and R&D. Figure 2 sets out the proposed approach to the development of the Programme of Measures in more detail.

Figure 2 – Structure of the Programme of Measures.



*Relavent Directives: Bathing Water¹⁵, Birds¹⁰, Drinking Water¹⁶, Major Accidents¹⁷, Environmental Impact Assessment¹⁸, Sewage Sludge¹⁹, Urban Waste Water Treatment²⁰, Plant Protection Products²¹, Nitrates¹⁴, Habitats¹¹, Integrated Pollution Prevention and Control³.



As stated earlier, the Programme of Measures and other detailed information regarding the river basin will be packaged and presented in a document called a River Basin Management Plan. These plans will be subject to a period of public consultation.

River Basin Management takes place on a 6 year cycle, with the first plan published 10 years after adoption of the Directive, and reviewed and updated every 6 years thereafter to take account of further measures needed to meet the Directive environmental objectives for any particular water-body.

5. Implementation Timetable

- Define basins, appoint Competent Authorities (End 2003)
- Analyse basins, review impact of human activity (End 2005)
- Commence monitoring programmes (End 2007)
- State issues and objectives for RBMP (End 2008)
- Derive Programme of Measures, consult on draft RBMP (End 2009)
- Plan enacted (End 2010 – End 2013)
- Plan reviewed (End 2014 – End 2016)
- Initial deadline for meeting Environmental Objectives (End 2016)

Despite what might at first glance seem a lengthy deadline for meeting the environmental objectives (End 2016) time is short and the first analysis of river basins must be complete in the next three years. The timescale set out in the Directive is challenging and will require considerable effort over a long period of time to achieve. The Agency is working to achieve this timetable and to adapt its monitoring programmes to meet the needs of the Directive. The earlier the process of implementation begins the better.

6. Environment Agency Role

The Agency has been strongly supportive of the principles underlying the WFD since it was first proposed. It has been heavily involved in the development of the Directive text, in the role of technical adviser to DETR (particularly during the UK presidency of the EU) and in providing detailed comments to the former rapporteur to the European Parliament Environment Committee.

The Agency has also been actively discussing the implications of the WFD with other European Regulators, in particular through a series of joint workshops with the German Lander Working Group on Water (LAWA) and a joint R&D project with the French Agences de l'Eau²². In addition the UK and German are jointly managing a pan-European R&D project looking at implications of the designation of waterbodies as artificial or heavily modified.

As well as developing links with European regulators the Agency has been involved in extensive discussions with UK regulators about implementation issues, in particular the Scottish Environ-



ment Protection Agency (SEPA) the Department of Environment in Northern Ireland (DoENI) the countryside agencies and British Waterways.

7. Conclusions

There can be little doubt that the Water Framework Directive represents a major step forward for water management. In particular it should be recognised that the Directive will:

- apply to all waters;
- utilise ecological (biology, hydromorphology and physico-chemistry) and chemical standards and objectives;
- integrate the consideration of groundwater and surface water;
- involve the public in management of river basins; and
- require the use of River Basin Management Planning throughout Europe.

In many respects, the UK already utilises the basic principles and philosophies set out in the Directive. The UK has made considerable progress in water quality improvement over the past 10 years; particularly the contributions made by the Water Industry investment programmes.

The overall principles laid out in the Directive should be applicable to any River Basin and can form a strategic and integrated planning tool for environmental improvement. This approach, associated with strong regulation and the will of society to make improvements, provides the flexibility required to make significant progress towards truly sustainable water catchments.

8. Acknowledgements

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