

2.0 CHARACTERISATION STUDIES

2.1 Water Framework Directive

The purpose of the Water Framework Directive (WFD), is to establish a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwaters which:

- (a) prevents further deterioration and protects and enhances the status of aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands directly depending on the aquatic ecosystems;
- (b) promotes sustainable water use based on a long-term protection of available water resources;
- (c) aims at enhanced protection and improvement of the environment, inter alia, through specific measures for the progressive reduction of discharges, emissions and losses of priority substances and the cessation or phasing-out of discharges, emissions and losses of the priority hazardous substances;
- (d) ensures the progressive reduction of pollution of groundwater and prevents its further pollution; and
- (e) contributes to mitigating the effects of floods and drought.

The general objective of the WFD is to prevent deterioration of water status and to secure at least 'good status' in relation to all waters by 2015.

A basic feature of the Directive is that it requires the co-ordination, on the basis of river basins, of all necessary measures for its implementation, and for this purpose it requires:

- the identification of River Basin Districts (RBDs) as the basic unit for the co-ordination of water management measures; and
- the production of a single River Basin Management Plan in relation to each RBD.

Initially, all existing Directives in relation to water quality remain in force and must continue to be implemented in full in the normal manner. The immediate effect of the WFD is to impose additional procedural and functional requirements to provide:

- a more coherent framework for implementation of these Directives; and

- a greater degree of co-ordination between the competent authorities involved in water management.

A number of existing individual Directives will be repealed in due course, and replaced by additional requirements of the WFD as implementation progresses.

The WFD is considerably broader in scope than most of the water quality plans and catchment-based initiatives undertaken to date in Ireland. These initiatives typically focused on water quality in rivers and lakes. In contrast, the WFD relates to:

- all inland and coastal waters i.e., rivers, lakes, canals, groundwaters, transitional (estuarine) and coastal waters;
- the biological / ecological status of surface waters;
- the chemical status of waters;
- water quality and quantity including the sustainable use of water;
- the protection of aquatic habitats and water-dependent terrestrial habitats; and
- the mitigation of floods and droughts.

2.2 Water Framework Directive Characterisation Requirements

Article 5 of the Water Framework Directive requires for each river basin district by 2004 (Figure 2.1):

- An analysis of its characteristics;
- A review of the impact of human activity on the status of surface waters and groundwater;
- An economic analysis of water use.

Economic analysis is to be addressed at national level within Ireland and is therefore excluded from the South Eastern River Basin District Management System project's remit.

The Water Framework Directive provides separate specifications for characterisation and review studies of:

- Surface waters (Annex II Section 1);
- Groundwaters (Annex II Section 2).

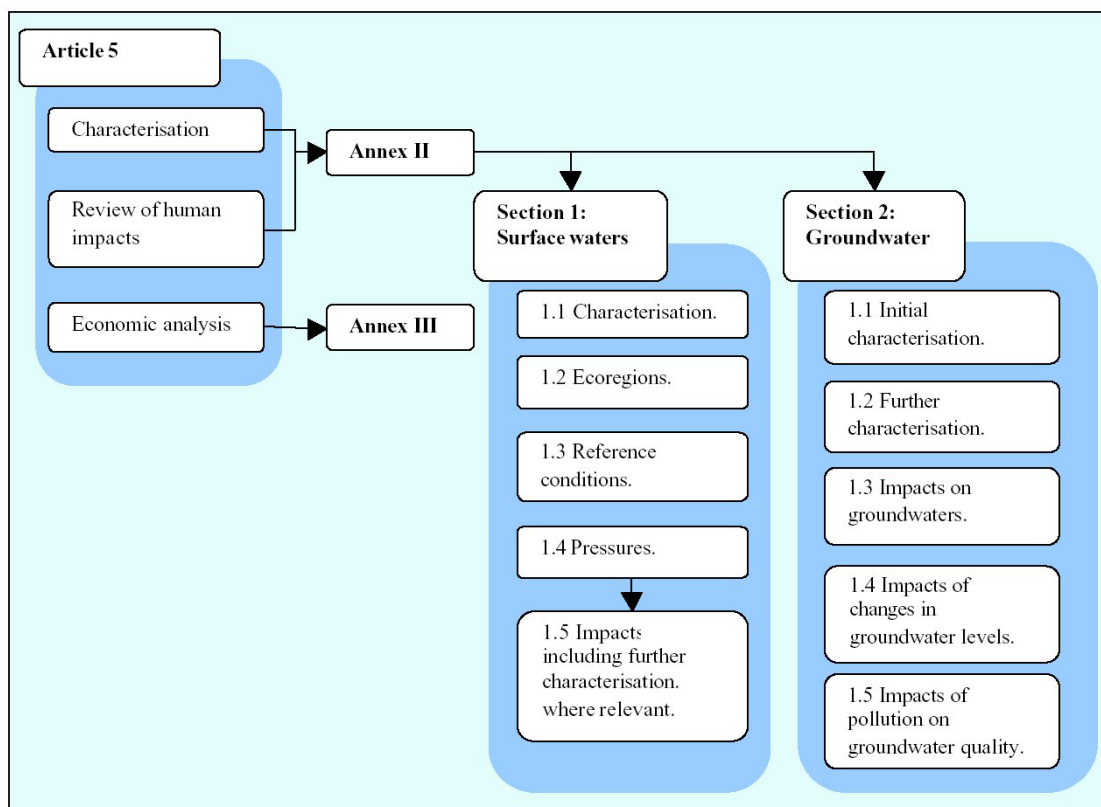


Figure 2.1 Source-CIS Working Document-Guidance for the analysis and pressures in accordance with the Water Framework Directive (IMPRESS)

2.2.1 Surface Waters (Summary of Annex II Section 1)

The Water Framework Directive requires that Surface Waters be characterised as follows:

1.1 Characterisation of Surface Water Body Types

The location and boundaries of bodies of surface water are to be identified as falling within categories (rivers, lakes, transitional waters and coastal waters or artificial or heavily modified water bodies) and differentiated according to type.

1.2 Eco Regions and Surface Water Body Types

The types for rivers, lakes, transitional waters and coastal waters are defined using either System A – fixed typology based on Ecoregion and type descriptors or System B – alternative characterisation using both obligatory and optional factors. System B is likely to be used in Ireland.

1.3 Establishment of Type-Specific Reference Conditions for Surface Water Body Types.

Type specific reference conditions are to be established for each body type representing hydromorphological, physico-chemical and biological quality of high ecological status.

1.4 Identification of Pressures

Information is to be collected and maintained on the type and magnitude of the significant anthropogenic pressures to which surface water bodies in each river basin district are liable to be subject. These should include, point source pollution, diffuse source pollution, water abstractions, flow regulation, morphological alteration, land use patterns and any other significant anthropogenic impacts.

1.5 Assessment of Impacts

An assessment of the susceptibility of the surface water status of bodies to pressures is to be carried out and the likelihood of these waters failing to meet their environmental quality objectives. These bodies identified as being at risk of failing shall be further characterised to optimize design of monitoring programmes and programmes of measures.

This initial characterisation (baseline) report presents the databases necessary to provide initial description of surface water bodies (and lands) and initial identification of pressures. These studies will be further developed as guidance develops both at European (Common Implementation Strategy) level and National level to enable characterisation of water bodies and assessment of impacts by the end of 2004.

2.2.2 Groundwaters (Summary of Annex II Section 2)

The Water Framework Directive requires that groundwater be characterised as follows:

2.1 Initial Characterisation

An initial characterisation of all groundwater bodies to assess use and degree of risk of failing to meet objectives is to be undertaken. This will identify location and boundaries, pressures, character of overlying strata and bodies with dependant surface water ecosystems or terrestrial ecosystems;

2.2 Further Characterisation

For bodies identified as being at risk further characterisation will establish a more precise assessment of the significance of risk and identify measures required. This process requires information on geological characteristics, hydrogeological characteristics, superficial deposits and soils information, stratification characteristics, surface system dynamic linkages, water exchange rates, long term overall recharge and groundwater chemical composition.

2.3 Review of Human Activity Impact on Groundwaters

For bodies identified as being at risk, information is to be collected on the location of significant abstraction, rates of abstraction, chemical composition of abstracted water, location of discharges to groundwater, sites of discharge, chemical composition of discharge and landuse – pollutant impacts and alterations to recharge.

2.4 Review of the Impact of Changes in Groundwater Levels

Any bodies of groundwater are to be identified for which lower objectives are to be specified as a result of the status of the body on surface water, water regulation and human development.

2.5 Review of the Impact of Pollution on Groundwater Quality

Any bodies of groundwater are to be identified for which lower objectives are to be specified as a result of human activity where the body of groundwater is so polluted that achieving good groundwater chemical status is infeasible or disproportionately expensive.

Again, as for surface water, this initial characterisation (baseline) report presents datasets to assist with the initial characterisation process for groundwaters which require to be further developed during the Project.

2.3 Outputs of the Characterisation Report

The principal outputs of the characterisation report will be:

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| 1. An assessment of significant pressures at a River Basin District level – because the significance of a pressure is not always known, this is interpreted as translating to a series of maps illustrating simple pressure indicators (e.g. total abstractions in a catchment). |
| 2. An assessment of water bodies at risk of not meeting their objectives – this is interpreted to be a list of water bodies known or considered, on the basis of best available information and understanding, likely to be failing their objectives in 2004 or likely to fail by 2015. |

Source: Water Framework Directive, Pressures and Impacts Scoping Strategy - Internal SEPA Report September 2002

Water bodies are not yet delineated for the South Eastern River Basin District but studies are underway and progress in relation to characterisation is presented in the following section. Once the delineation procedure is agreed water body maps will be presented and developed and a risk assessment will be undertaken to identify the most significant pressures and the bodies at risk of failing to meet their objectives.

2.4 Ongoing Characterisation Studies in Ireland

Surface Waters - Nationally, the EPA are leading a series of studies into identifying characterisation, typology and reference conditions for rivers, lakes, transitional and coastal waters. The characterisation and typology systems for rivers are being developed using GIS datasets on geology, soil type, flow, slope, altitude, size etc. The proposed systems are being piloted on the river sites in the South Eastern River Basin District. The system has not as yet been agreed therefore reference

conditions and ecological targets cannot yet be finalized for water bodies. The current status of water bodies must therefore be related to existing environmental quality objectives.

Surface Waters Characterisation Systems

Systems for characterising rivers, lakes, transitional and coastal water bodies are currently being developed by the EPA.

Groundwaters - A groundwater working group (GWG) has been established at national level to scope the technical requirements for the initial characterisation of Irish groundwater bodies. The GWG has produced guidance in River Basin Management Systems Technical Requirements for Groundwater and Related Aspects. Considerable work is underway to produce the information necessary and both GSI and Teagasc are involved in the preparation of datasets and mapping.

Groundwater Characterisation Methodology

Methodology and datasets for characterising groundwaters are currently being developed by the GSI with sand and gravel boundaries being developed by Teagasc.

Assessment of the South Eastern River Basin District has been prioritised to pilot methodologies and provide data in a timely manner to the first of the national Water Framework Directive implementation projects. The current status and example outputs from GSI's work to date are presented below:

To date the GSI has provided reports detailing the geology and hydrogeology of 8 Local Authority areas (Kilkenny, Kildare Laois, Offaly, Tipperary North and South, Waterford and Wicklow) in the entire South Eastern River Basin District for which completed groundwater protection schemes have been provided. A rock outcrop and bedrock geology map of the South Eastern River Basin District has also been provided. These reports and accompanying map sheets also include information on groundwater quality, aquifer classification and vulnerability which has been used to prepare the physical description of the groundwaters in the South Eastern River Basin District and in the assessment of groundwater quality. It is estimated that there will be 80 groundwater bodies in the South Eastern River Basin District, 36 of which are nearing completion. The remaining groundwater bodies which include sand and gravels overlying bedrock groundwater bodies will be completed in early 2003. The example of detailed information that will be available for each groundwater body is included in Appendix A.