7. SPECIFICATION OF A DESIGN FRAMEWORK

7.1 Scope of the monitoring programme

The broad purpose of water quality monitoring is to provide information to water resources managers and other stakeholders which they can use to assess the fitness of water for use and to make decisions required for water resource management.

> **The specific long-term goal of the biomonitoring programme will be to directly measure, assess and report on the *health status and trends* of aquatic ecosystems, including those of rivers, dams, wetlands and estuaries, in South Africa.**

The data collected by the programme could also be used to support:

- assessments of the likely impacts of changes in water quality and or flow regime on the health of aquatic ecosystems
- the formulation of scientifically defensible environmental quality objectives, based on ecological characteristics
- regional audits of the status of aquatic ecosystems.

7.2 Information users

The programme must be designed to meet the information requirements of the primary users, namely water resource managers in DWAF, tasked with the duty of ensuring the sustainable use and health of South Africa's aquatic ecosystems.

Secondary users of the information provided by the biomonitoring programme could include any or all of the following:

- National, provincial and local environmental protection and nature conservation organisations responsible for water resources management, or concerned with aquatic ecosystems;
- Effluent producers having to comply with requirements aimed at protecting the health of aquatic ecosystems;

- Interested and affected individuals and groups in academic institutions, non governmental organizations, community based organizations and the general public.

7.3 Geographic coverage

In order for the biomonitoring programme to meet its stated purpose, it is clear that an effort on a national scale is required. However, the variability of conditions across the country - in terms of climate, geography and the influence of human activities - will require the use of region-specific reference conditions as opposed to a single, national reference condition.

The scale of the biomonitoring programme, in terms of the number and location on monitoring sites, will have to take into account the concept of biogeographic regions, or physiographic regions. Location of individual monitoring sites will then have to be determined within the context of these regions.

Because of the different approaches that will be needed to monitor and manage the different types of aquatic resources, the initial biomonitoring programme design will focus on the development of a system for monitoring of riverine ecosystem health.

7.4 Assessment end-points of aquatic health

The role of both reference sites and water quality criteria in determining the health status (and trends) of aquatic ecosystems needs to be well defined. In addition, the assessment methodology should be well defined and take into account:

- Use of appropriate ecosystem indicators
- Use of appropriate ecosystem indices

7.5 Reporting of information

The method and format used to present the information collected as part of a monitoring programme is critical to the success or failure of the programme. It is at this point that information users will judge whether or not the programme meets their information expectations.

While the data collected by the programme must have a sound scientific background, it needs to be presented in a clear, accessible and understandable format. Original data must always be available, if needed, to motivate conclusions and assessments. The optimal use of ecosystem indices will facilitate this need, and techniques and methods must be developed to present these in an easily understandable format.

The programme must be designed in such a way that the GIS platform of the Department of Water Affairs and Forestry can be used as one of the principle mechanisms by which information can be reported and used.

7.5.1 Prototype biomonitoring report

Development of the format whereby information on the general health status of aquatic ecosystems could be reported on national, regional and catchment scales in South Africa, will be done by means of "prototype reports". This reporting format must be developed on an on-going basis, and revised at key points in the project in order to provide a verified and documented link between management needs and expectations, and the capability of the monitoring programme to meet those needs.

7.6 Design team composition

The technical design team for the project will be composed of managers, scientists and researchers from a number of organisations, including universities, consultancies, national and provincial departments, and various others. This multi-disciplinary team will be managed by the CSIR, who are responsible to the DWAF for the overall project.