

**South African
National Water Quality
Monitoring Programme Series**

**National
Microbial
Monitoring
Programme**
for
Surface Water

Implementation Manual



**Department of
Water Affairs and Forestry**



Water Research Commission

**Second Edition
2002**

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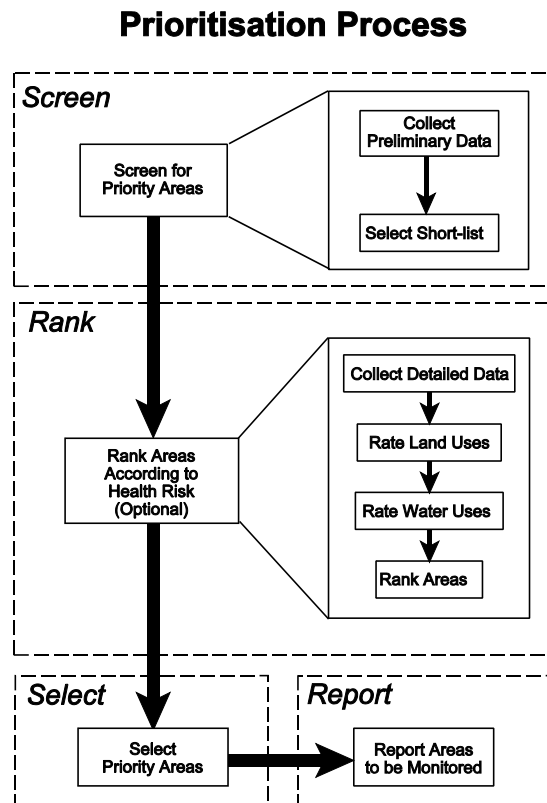
Prioritisation Process

Given (a) the distinct non-conservative behaviour of microbes in water and (b) the essential need to use resources as cost-effectively as possible, a process has been developed that ranks priority areas. This is based on the identification of problematic land uses and water uses sensitive to microbial quality. The process is a desk study only, not involving actual monitoring.

Land uses that can result in significant faecal pollution include settlements that have no sanitation infrastructure or one that is inadequate. Intensive livestock farming without sound waste handling practices is also problematic. Settlements that result in high runoff after rainfall events (and hence contamination of surface waters) are also considered.

There is only a health risk when people are actually exposed to faecally contaminated water. Particularly sensitive water uses include drinking of untreated or partially treated surface waters. Full or partial external contact with water (such as from swimming or washing) also exposes people to significant health risk. The irrigation of crops that are ultimately eaten raw (like lettuce and tomatoes) is likewise a serious problem.

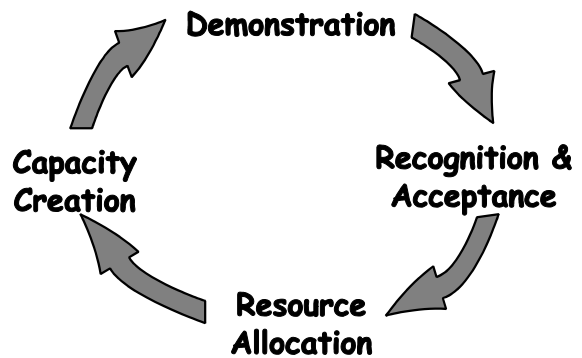
The prioritisation process involves an initial screening phase based on relatively simple criteria. The resulting short-list will often be sufficient for managers to choose from when initialising microbial monitoring. If a more objective (and quantitative) process is necessary then the next ranking and selection phases can be carried out. The overall process will facilitate a phased implementation of the programme. The areas with highest risk are earmarked for individual monitoring programmes.



National Implementation Process

Creating national coordination is important in a nationwide implementation process. A single person, ideally within DWAF, should be assigned this role. This person should facilitate in whatever way possible both national and regional implementation.

The general implementation model is based on the “Demonstration-for-Resource Allocation Spiral” approach used successfully by the River Health Programme (a national biomonitoring programme). This involves choosing a few priority areas and implementing the NMMP full scale in those areas. The results of this exercise can then be presented to other potential concerned parties in order to demonstrate success, create buy-in and hence willing allocation of resources for further implementation.



The “Demonstration-for-Resource Allocation Spiral” model of the River Health Programme [Roux, 1997].

An annual national assessment report will also be produced that summarises the situation in all areas being monitored. This report presents the information in a way that communicates well with the water resource managers, for example by using colour maps. It will indicate the potential health risk of the four most sensitive water uses at all sampling sites. It will also present an overall potential health risk index for the year (which can be compared with equivalent values for previous years).

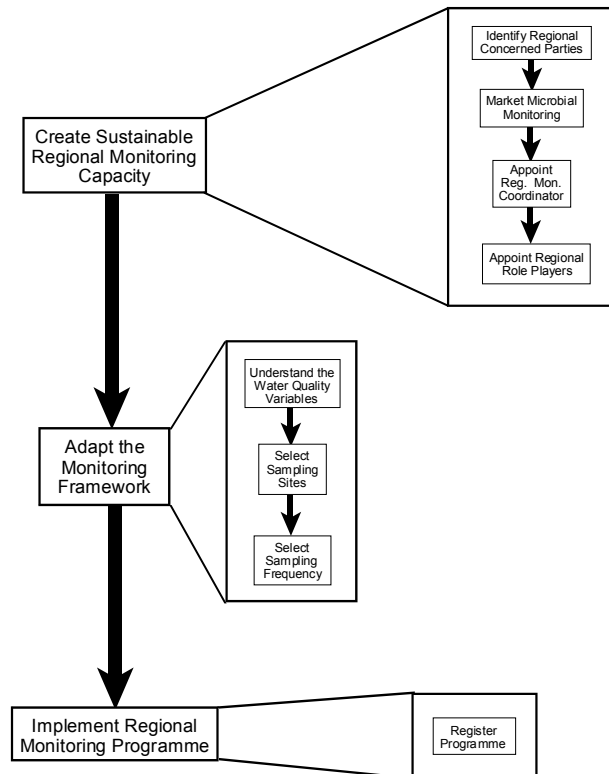
Regional Implementation Process

Once an area is identified as a priority area by the prioritisation process, a regional monitoring programme must be established that meets the national objectives of the NMMP. Although the primary responsibility rests with DWAF, the regional concerned parties that can benefit from a local monitoring programme must be identified and approached. These include, among others, the Department of Health, catchment management agencies, water user associations, major industry and so on. Ideally, their involvement should be a ‘win-win’ situation.

To achieve this, it will be necessary to ‘market’ microbial monitoring. A wide range of tools is presented in this document for doing this. These include various diagrammatic representations of issues, processes and how information flows from sampler to Minister. Tables are presented that summarise information, including resources required.

A regional monitoring coordinator must be appointed. That person must identify and appoint the various other regional role players and decide where sampling should take place. Sampling frequency is proposed to be weekly (based on a statistical analysis of the results of the pilot studies) though this can be changed if justified. Once the regional monitoring programme is formally registered with DWAF, sampling can begin.

Microbial Monitoring Programme
Regional Implementation Process



Monitoring Roles

Monitoring programmes involve the collection of data and converting this to useful information. The overall structure of data and information flow has been carefully considered in this document (and is presented diagrammatically). Individual roles have also been identified and described in detail. This structure will facilitate a clear definition of these roles and buy-in to the process by ensuring each individual role player understands where he or she fits into the overall picture.

The following diagram illustrates the roles and information flow. The following table identifies typical role players for each role.

National Microbial Monitoring Programme Roles and Information Flow

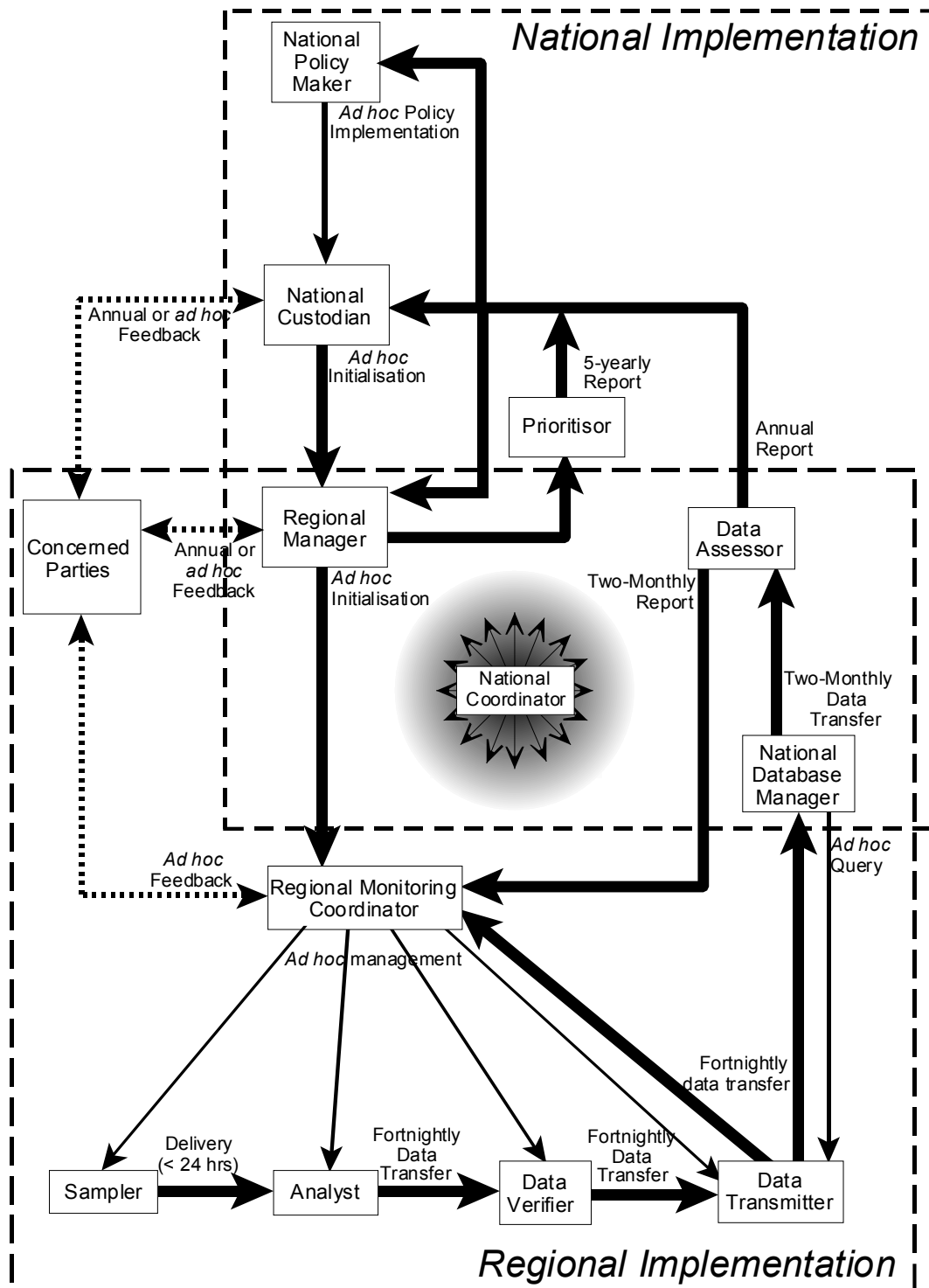


Table 1. Summary of roles and typical role players.

Role	Typical Role Players
National Policy Maker	Minister of Water Affairs and Forestry, Minister of Health.
Concerned Parties	Any person or organisation with an interest in microbial water quality or that might be affected by deteriorating microbial water quality.
National Coordinator	A single person from the Department of Water Affairs and Forestry (DWAF).
Prioritisor	The Department of Water Affairs and Forestry (DWAF) and/or appointee. (Possibly the National Coordinator.)
National Custodian	Department of Water Affairs and Forestry (DWAF) Directors or Chief Directors.
Regional Manager	Water Quality Managers of Department of Water Affairs and Forestry (DWAF) Regional Offices or appointed representative of the relevant catchment management agency. (Possibly the Regional Monitoring Coordinator.)
Regional Monitoring Coordinator	Typically a representative of the relevant catchment management agency or a DWAF Regional Office.
Data Assessor	Microbiologist with experience in the behaviour of faecal coliforms in environmental waters. Typically in the Department of Water Affairs and Forestry (DWAF).
National Database Manager	The Department of Water Affairs and Forestry (DWAF).
Data Transmitter	Laboratory.
Data Verifier	Laboratory microbiologist with experience in the behaviour of faecal coliforms in environmental waters.
Analyst	Laboratory.
Sampler	Laboratory, DOH environmental health officers, water board or local authority.

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