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# Tools Give Resource Managers More Muscle

***A new set of tools, aimed at enhancing the practical application of the resource-directed management of water quality, has been launched by the Department of Water Affairs & Forestry (DWAF). Lani van Vuuren reports.***

Following promulgation of South Africa's groundbreaking water legislation in the late 1990s, water quality management in the country entered a new era, moving from a historic end-of-pipe to a more holistic integrated water resource management approach. The purpose of the National Water Act of 1998 is to ensure that the country's water resources are protected, used, developed, conserved, managed and controlled in an equitable, efficient and sustainable manner.

This necessitates a change in the approach of water quality management to an integrated source, resource and remediation focused management approach. Among others, the Act makes provision for the 'Reserve' – a particular water quality and quantity to be set aside to protect the ecological functions of an aquatic ecosystem before water uses such as the abstraction of water from, or the discharge of water containing waste to a water resource can be authorised.

Yet, practically implementing South Africa's internationally recognised legislation has proved challenging, with limited guidance to water resource managers as to exactly how to go about balancing the use of water to achieve social and economic development while safeguarding the resource for future generations. "Few to no guiding policies were available on the various facets of the resource side of water quality management," explains Pieter Viljoen, DWAF Deputy Director: Water Resource Planning Systems: Water Quality Planning. "To date, determination of the requirements at the resource end and the incorporation of these into source-directed water quality management decision making has generally been performed ad hoc, with little uniformity."

To improve the situation, DWAF launched a project aimed at providing enabling policy, with supporting management instruments in 2003. Led by CSIR's Natural Resources and the Environment Unit, the Resource Directed Management of Water Quality Series specifically addressed the water quality aspects within the integrated water quality management model. The newly-launched management instruments comprise guideline documents and, where applicable, computer-based programs to support streamlined and uniform implementation of the methods and instruments, to facilitate the management of water quality from a water resources perspective.

It is the first time that policy and management tools such as these have been produced by DWAF, according to Director: Water Resource Planning Systems Chris Moseki. "Our present legislation underscores the fact that our natural resources belong not to us but to our children and their children, and we need to ensure sustainable use. These documents go a long way to facilitate the integration of the source and resource-directed management approaches in a uniform and structured manner. Furthermore,

we expect these tools to be dynamic, improving further with time."

The series comprises a number of volumes, the first being a resource-directed management of water quality policy document. This policy relates specifically to management of the use and protection of the water quality component of inland water resources, including surface watercourses, groundwater, estuaries and wetlands. It also addresses how this water quality management should influence the management of anthropogenic activities that modify the water quality in water resources.

In turn, the strategy document provides the implementation plan for the policy. It addresses who should do what by when, explicitly linking the policy to management approaches and management instruments to facilitate its practical and pragmatic implementation. There is also a document focusing on institutional arrangements for resource-directed management for water quality.

A suite of management instruments to assist regional DWAF offices makes up the remainder of the series. This includes guidelines on catchment visioning for resource-directed management of water quality; guidelines for determining resource water quality objectives; the allocatable resource and resource stress.

The latter is influenced by the socio-economic need to utilise the capacity of water resources to assimilate waste, on the one hand and, on the other hand, by the need to protect the said water resource to ensure a healthy functioning aquatic ecosystem that is fit for use by the recognised water user sectors. The determination of resource water quality objectives provides the basis for conducting water quality allocations, benchmarking during water quality foresights, and the determination of water quality stress.

*The project team responsible for compiling the set of tools.*

As part of the guideline, a resource water quality objective model was prepared. This is a computer-based application, which provides users with an approach to consistency when setting resource water quality objectives for water resources. By selecting the water resource and user requirements, the model generates water quality objectives based on a database of provided and entered water quality parameters. Also included in this regard is a guideline for converting resource water quality objectives into end-of-pipe discharge standards.

Another software program developed as part of the project is the Assessment of Consideration for Water Use Applications or ACWUA. ACWUA has been developed to allow multiple criteria decision analysis, using indicators to inform decisions on licence applications.

The program guides the responsible authority by supporting decision-makers despite incomplete, imprecise and/or variable information. The decisions are based on multiple criteria such as socio-economic factors, race and gender considerations and alignment with catchment strategies.

Lastly, guidelines for monitoring and auditing resource-directed management of water quality are also provided.

Following the completion of the technical phase of the project, DWAF, through consultants Nemai Consulting, has embarked on a regional programme of training and capacity building. "These tools are a solid foundation on which to build. We hope these documents will offer practical tools to make integrated water resource management a reality in South Africa," concludes Viljoen.

*Signing the final project deliverables are Hanlie Hattingh of the CSIR Natural Resources and the Environment Unit; DWAF Deputy Director: Water Resource Planning Systems Pieter Viljoen: and Water Quality Planning; and Chris Moseki DWAF Director: Water Resource Planning Systems.*