



Department : Water Affairs  
and Forestry

# Integrated Water Resources Management



**Groundwater Management Strategy**  
Executive Summary



**DEPARTMENT OF WATER AFFAIRS AND FORESTRY**

**INTEGRATED WATER RESOURCES MANAGEMENT**

**GROUNDWATER MANAGEMENT STRATEGY**

**EXECUTIVE SUMMARY**

INTEGRATED WATER RESOURCE MANAGEMENT  
STRATEGIES, GUIDELINES AND PILOT IMPLEMENTATION  
IN THREE WATER MANAGEMENT AREAS, SOUTH AFRICA

**DANIDA**  
FUNDING AGENCY

**Edition 1**

**March 2004**

**TITLE:** GROUNDWATER MANAGEMENT STRATEGY:  
EXECUTIVE SUMMARY

**FUNDING AGENCY:** DANIDA

**CATEGORY:** Strategy

**PURPOSE:** To present a suite of strategies with a wide scope including: management; protection and use; institutional arrangements; human resources and capacity building, for inclusion in the National Water Resource Strategy.

**TARGET GROUP:** DWAF, IWRM Project Consultants and implementers in three Water Management Areas.

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**DOCUMENTS FOR OUTPUT 7: STRATEGIES, TOOLS AND SYSTEMS APPLIED WITHIN THE THREE SELECTED WMAS TO ACHIEVE SUSTAINABLE GROUNDWATER DEVELOPMENT AS AN INTEGRAL PART OF IWRM:**

1. a. Groundwater Management Strategy for National Water Resource Strategy, DWAF/DANCED, 2001
- b. Groundwater Management Strategy: Summary, DWAF/DANCED, 2002
- c. Groundwater Management Strategy: Executive Summary, DWAF/DANCED, 2002**
  
2. a. Guidelines for Groundwater Management in Water Management Areas, South Africa, Carl Bro a/s, IZNA Consortium, February 2002
- b. Guidelines for Groundwater Management in Water Management Areas: Summary, South Africa, Carl Bro a/s, IZNA Consortium, February 2002
- c. Guidelines for Groundwater Management in Water Management Areas: Executive Summary, South Africa, Carl Bro a/s, IZNA Consortium, February 2002

**RELATED DOCUMENTS:**

First Edition National Water Resource Strategy, DWAF 2002

Integrated Water Resources Management Communication Strategy, DWAF

Generic Communication Strategy for IWRM, DWAF/DANCED, December 2001.

Institutional Roles and Linkages: Phase 1 Report, Carl Bro a/s, IZNA Consortium, February 2002.

Guidelines for Stakeholder Participation in Integrated Water Resources Management in Water Management Areas in South Africa, Carl Bro a/s, March 2001.

Evaluation of the involvement of Previously Disadvantaged Individuals in the Catchment Management Agency establishment process the three Water Management Areas, date.

Capacity Building Overview Assessment Vol.1, Carl Bro a/s, IZNA Consortium, October 2001.

Capacity Building Overview Assessment Vol.2, Specific Capacity Building Requirements of Role-Players, Carl Bro a/s, IZNA Consortium, October 2001.

Capacity Building Implementation Plan, Carl Bro a/s, IZNA Consortium, April 2002

Guideline on the Viability Study for the Establishment of a Catchment Management Agency, Carl Bro a/s, Pegasus Strategic Management, February 2002.

## INTRODUCTION

The National Water Act (Act 36 of 1998) clearly includes groundwater in the definition of a water resource. However, the characteristics of groundwater sometimes require it be considered or managed differently to other water resources. The aim of this document is to provide a summary of the groundwater management strategy for the country, which has been based on the characteristics of the resource, the requirements for integrated water resource management (IWRM) and the guiding principles of sustainability, equity and efficiency as recognised in the National Water Act.

Groundwater is a major source of water in South Africa and a powerful tool for creating a better life for many people in the country. Groundwater is found throughout South Africa in secondary fractured, hard rock aquifer systems that are difficult to manage and protect. Major groundwater resources are restricted to coastal sand deposits along the west and south coast of the Cape and along the KwaZulu Natal coast.

It is estimated that groundwater accounts for approximately 13% of all water used in South Africa. Recent surveys show that almost 60% of rural communities are groundwater dependent and about 320 towns and villages are dependant on groundwater to some degree. It is estimated that less than 20% of South Africa's available groundwater resources are currently used.

Groundwater is the only viable means of supplying basic human water needs to millions of rural South Africans. Presently approximately 15 million of rural people draw their drinking water from the ground. Thus groundwater plays an important role in the national government's initiative to supply potable water to the people and contribute to eradication of poverty.

At present, groundwater management is driven at a national level. Most groundwater management issues need to be dealt with locally, including: resource assessment; reserve determinations; setting resource quality objectives; development of catchment management plans; licensing and allocation; management and monitoring of groundwater abstraction schemes, and management and monitoring of groundwater contamination problems.

### VISION

GROUNDWATER IS ACKNOWLEDGED BY ALL WATER MANAGERS AS AN IMPORTANT AND INTEGRAL PART OF SOUTH AFRICA'S WATER RESOURCES, AND IS MANAGED AS SUCH.

INSTITUTIONS INVOLVED IN WATER RESOURCE MANAGEMENT WILL ABIDE BY IWRM PRINCIPLES, AND GIVE ADEQUATE ATTENTION TO THE ROLE OF GROUNDWATER IN THE ENVIRONMENT AND AS A STRATEGIC SOURCE FOR WATER SUPPLY.

### **CORE GROUNDWATER MANAGEMENT STRATEGIES**

The Groundwater Strategy recognises the need for a paradigm shift so that groundwater is given recognition as a vital, strategic resource, which should form an integral part of water resource management. Twenty-nine strategies have been developed to ensure the optimal development and management of groundwater resources in South Africa. However, five core strategies are identified as the most important with regard to initiating the required change:

- **INTEGRATION:** Integrate groundwater into the management of water resources for the benefit of all of South Africa's peoples;
- **AWARENESS:** Promote groundwater so that water resource managers, water users and the public are more aware of the role, occurrence and value of groundwater;
- **HUMAN RESOURCES – LINKING:** Encourage and enable hydrogeologists to work outside their line function, and be integrated into the broader water resource planning and management functions;
- **SKILL BASE:** Develop a larger, skilled and experienced specialist hydrogeological workforce, and a hydrogeological information system to assist in the provision of data to those who need it.

A suite of twenty-nine practical, feasible and affordable strategies, many of which are interlinked, were identified to support the core strategies and ensure that groundwater is ultimately effectively managed through integrated water resource management. The strategies included:

#### **Groundwater Management**

- Base all water resource management at national, catchment and local levels on the principles of IWRM.
- Recognise groundwater as an integral part of a catchment's water resources, and manage it properly according to sound scientific assessments and participative planning.
- Require each catchment management agency (CMA) to include a groundwater management plan as part of the catchment management framework.
- Require each CMA to have sufficient groundwater specialists available to oversee sustainable development, monitoring and management of groundwater resources. Such specialists can be either employed by the CMA or outsourced when required.

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## **Groundwater Protection**

- Improve public awareness and involvement as a guard against degradation of groundwater resources. Empower the public to understand groundwater issues and appreciate the value of the resource.
- Protect water resources using instruments such as land-use zoning, classification of aquifers, environmental management plans and environmental impact assessments.
- Involve groundwater institutions and specialists in the debate and decision-making processes regarding South Africa's resources and environment.

## **Monitoring**

- Implement an ambient hydrogeological monitoring network at a catchment level, with data storage and management facilitated by the central authority.
- Drive the monitoring of aquifer response to abstraction and potential pollution by means of licensing and permitting, with the CMA responsible for implementation.
- Provide central authority guidance regarding monitoring protocols and requirements, and audit monitoring undertaken at a local scale.

## **Data and Information Management**

- Develop and implement a national hydrogeological information system urgently.
- Foster widespread promotion and use of the information system amongst the hydrogeological community, so that hydrogeological data and information exchange can be readily achieved.

## **Priority Use of Groundwater**

- Use groundwater in instances where comparison to surface water resources shows it to be economically and environmentally superior.
- Promote conjunctive use as a part of IWRM.

## **Institutional Arrangements**

- Integrate groundwater management with other activities of CMAs.
- Establish Groundwater Advisory Groups to provide assistance and guidance to CMAs or groups of CMAs.
- Deploy groundwater expertise within the appropriate line functions of the central authority.

## **Human Resources**

- Ensure active participation of experienced hydrogeologists in the planning and management hierarchies of both DWAF and CMAs.
- Integrate at least three hydrogeologists into each CMA (senior professional, junior professional, senior technician), although these resources can be outsourced when required.

### **Education and Training**

- Develop and promote specialist groundwater education and training programmes, which include an IWRM component.
- Include principles of IWRM in all water related education and training curricula.

### **Capacity Building**

- Enhance the capacity of non-specialists with respect to groundwater management as an integral part of IWRM.
- Enable institutions, including historically disadvantaged institutions, to sustain development of well-qualified water managers.

### **Promotion of Groundwater**

- Initiate a multi-level information campaign to promote knowledge and awareness of groundwater. Popularise groundwater among the upper DWAF hierarchy.
- Establish a South African Groundwater Trust to develop and lead a multilevel awareness and education campaign, both inside and outside the public sectors.
- Disseminate information about successful groundwater schemes, while offering reasons for the failure of less successful projects.
- Encourage the hydrogeological fraternity to regularly present lectures and talks to schools, business organisations, learned societies, environmental societies etc.

### **Research Needs**

- Promote relevant and applied groundwater-related research, so that practicing hydrogeologists have both knowledge and the appropriate tools to manage South Africa's groundwater resources in an integrated manner.
- Use research as a vehicle to accelerate education, capacity building, transformation and implementation of integrated water resource management.

## IMPLEMENTATION

- It is clear that groundwater can only be properly incorporated into national- or catchment-scale water resource management when most, if not all, of these strategies have been addressed. Implementation of the National Water Act (Act 36 of 1998) and establishment of CMAs provide a unique opportunity to instigate the paradigm-shift necessary to optimally develop and manage water resources in South Africa.

By focusing on the core strategies, groundwater can be included in IWRM in South Africa. The fact that groundwater is used as a source of water for more than 15-million South Africans clearly demonstrates the importance of the resource. Bold initiatives are required to ensure that groundwater is utilised to its full potential throughout South Africa. Implementation of the strategies presented above, and particularly the five core strategies will be important elements in this.