

WATER QUALITY MANAGEMENT POLICIES AND STRATEGIES FOR SOUTH AFRICA

A REVIEW OF WATER QUALITY MANAGEMENT INSTRUMENTS IN SOUTH AFRICA

Report Number 1.2.3

February 2016

INAUGURAL REPORT



water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

Water Resource Planning Systems Series

Water Quality Planning

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*This Inaugural Report serves as an initial report, used for discussion purposes, and will be updated during the Project, with the final, Edition 1 Report produced at the end of the Project.


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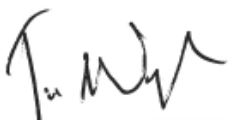


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EXECUTIVE SUMMARY

South Africa is often lauded with having one of the most progressive Constitutions and Water Acts. However, this great framework alone cannot guarantee the sustainable and equitable use of the country's most precious resource. Rapid urbanisation, expansion of the mining industry, increasing use of chemicals in agriculture and destruction of our natural/green infrastructure has undermined the quality of the country's water resources. Poor water quality impacts negatively on human health, threatens downstream irrigation areas and food security, increases industrial costs and raw water treatment costs arising from removing pollutants, reduces income generated from recreation and ecotourism, destroys ecosystems and affects biodiversity. The deterioration of water quality is therefore an issue that can affect many national priorities and strategies including strategies for economic development, health management and biodiversity conservation. Sustainable development in South Africa is critically dependent on assurances of good quality of the country's limited resources. Development must be balanced by an increased supply of water of an appropriate quality to satisfy the human needs. Water quality management has to be conducted within the realities as outlined above. Part of the projects looks at reviewing the current WQM Policies and Strategies, the WQM Institutional Arrangements and the WQM Instruments. This report, the third of the series, aims to provide a baseline understanding of the instruments that govern and manage WQM in South Africa.

The management of water quality in the country falls under the broader umbrella of water resources management and can be categorised under legal instruments and regulatory instruments. South African's most powerful legal instrument is that of the South African Constitution. Chapter Two of the Constitution of South Africa contains the Bill of Rights which is the human rights charter that protects the civil, political and socio-economic rights of all people residing in South Africa. Importantly, the Bill of rights apply to all law and bind all branches of the government, including the national executive, Parliament, the judiciary, provincial governments and municipal councils. Stemming out from this are the guiding policies on water and sanitation, which provide the framework on which the three Acts, viz. the Water Services Act, the National Water Act and the National Environmental Act are based. These Acts, together with the National Water Resources Strategy and the Strategic Framework for Water Services are legally binding documents in South Africa to aid in the management of the country's water resources, and by default water quality.

The regulatory instruments are subdivided into four categories:

❖ **Command and Control**

Under the command and control approach to regulation, government prescribes specific guidelines or standards that regulated parties must comply with. There are various forms that such guidelines or standards can take, such as prohibitions on certain activities, licensing of regulated activities, setting of product or technical production standards, or setting of performance standards.

❖ Economic Mechanisms

While there are variations in the definition of economic instruments in the literature, UNEP (undated) offers the following definition: ***“a policy, tool or action which has the purpose of affecting the behaviour of economic agents by changing their financial incentives in order to improve the cost-effectiveness of environmental and natural resource management.”***

Since the inception of environmental policy in most industrial countries, governments have tended to use these instruments as their main strategy for controlling pollution. Many countries, however, are becoming aware that regulatory instruments are inefficient for achieving most pollution control objectives, and that the level of expenditure required to comply with increasingly stringent environmental laws and regulation is becoming a major cost of production (WHO, 1997). Economic instruments have been described as promising tools for advancing sustainable development and therefore, WQM. One such instrument is the Waste Discharge Charge System.

❖ Voluntary Agreements

Voluntary regulation is an important addition to the suite of instruments that can be used to achieve regulatory objectives. While voluntary regulation is used in both developed and developing countries, there is disagreement on how effective it has been in developing countries. Examples of voluntary agreements include cooperative governance; multi-sector partnerships; self-regulation; environmental agreements negotiated between regulators and industry; public programs that individual firms are invited to join; public disclosure initiatives that collect and disseminate information on participants' environmental performance; and unilateral commitments made by firms.

❖ Information

While adequate information is a prerequisite for all forms of regulation, and the exercise of all regulatory instruments, it can also be used as a regulatory tool in its own right. Requiring water users to disclose information can provide a useful way for authorities to collect information. Equally, if the information is made public, such disclosure can also give the public access to the information and provide for monitoring and control both by the authorities and by public pressure. The collection of information also signals to water users that the authorities are taking their regulatory role seriously.

Therefore, this report has highlighted a number of instruments that the Department has at its disposal and discusses its approach to water quality management. While the list is not exhaustive, it provides a good framework for WQM in South Africa. As with the review of WQM Policies and Strategies, the crux is trying to determine the gaps and challenges with the WQM Instruments. Armed with this baseline knowledge, the team is able to probe further, specifically at those tasked to implement these instruments to understanding what is and is not working, what is missing and well as what needs to improve.

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LIST OF ACRONYMS

Abbreviation	Meaning
CMA	Catchment Management Agency
CMF	Catchment Management Forum
CMS	Catchment Management Strategy
COGTA	Department of Cooperative Governance and Traditional Affairs
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DMR	Department of Mineral Resources
DWA	Department of Water Affairs
DWS	Department of Water and Sanitation
e-WULAAS	Electronic Water User Licences and Authorisations System
IWQM	Integrated Water Quality Management
IWRM	Integrated Water Resource Management
IWUL	Integrated Water User Licence
M&E	Monitoring and Evaluation
NGO	Non-Government Organisation
NPS	Non-point Source
NWA	National Water Act (Act 36 of 1998)
NWRS	National Water Resource Strategy
RDM	Resource Directed Management
RSA	Republic of South Africa
SALGA	South African local Government Association
SWPN	Strategic Water Partners Network
TDS	Total Dissolved Solids
UNEP	United Nations Environment Programme
WARMS	Water Authorisation and Registration Management System
WCAP	Water Sector Capacity Building and Advisory Services Project
WDCS	Waste Discharge Charge System
WFD	Water Framework Directive
WQ	Water Quality
WQM	Water Quality Management
WRM	Water Resource Management
WRUAs	Water Resource Users' Associations
WSA	Water Services Act (Act 108 of 1997)
WUA	Water User Association
WWTW	Waste Water Treatment Works

1. INTRODUCTION

1.1 Background to the Project

South Africa is often lauded with having one of the most progressive Constitutions and Water Acts. However, this great framework alone cannot guarantee the sustainable and equitable use of the country's most precious resource. Rapid urbanisation, expansion of the mining industry, increasing use of chemicals in agriculture and destruction of our natural/green infrastructure has undermined the quality of the country's water resources. Poor water quality impacts negatively on human health, threatens downstream irrigation areas and food security, increases industrial costs and raw water treatment costs arising from removing pollutants, reduces income generated from recreation and ecotourism, destroys ecosystems and affects biodiversity. The deterioration of water quality is therefore an issue that can affect many national priorities and strategies including strategies for economic development, health management and biodiversity conservation (DWS, 2015).

Sustainable development in South Africa is critically dependent on assurances of good quality of the country's limited resources. Development must be balanced by an increased supply of water of an appropriate quality to satisfy the human needs. Demand for water will continue to grow as the country's population increases as well as social and economic conditions improve in South Africa. Consequently, placing increasing pressure on the country's scarce water resources and concurrently, increasing potential threats to water quality (DWAF, 2003).

Water quality management has to be conducted within the realities as outlined above. The challenge has always been to clearly articulate water user requirements for specific circumstances and matching them with appropriate measures to ensure on-going beneficial water use. It is recognised that the existing Water Quality Management (WQM) policy is dated (Water Quality Management Policies and Strategies in the RSA in 1991 and the Resource Directed Management of Water Quality in 2006) and whilst innovative at the time of publication, is now in need of revision in order to align with current overarching policy and legislative frameworks. Key amongst these issues is fundamental changes in governance and institutional frameworks and the need to consider more carefully the role of various public and private actors. It is also recognised that there is a range of supporting operational policies, strategies, management instruments and methodologies that have been developed and implemented in recent years. These provide a significant platform for the development of new strategies and policies, based upon the pragmatic experience of implementing these instruments. It should be noted that the integration of the WQM Policy and IWQM Strategy with wider national policies provides the opportunity to align the approaches toward managing water quality with other activities the Department, and in Government as a whole. This will help entrench this project and secure its sustainability going forward.

1.2 Context of the Report

This literature review, together with the glossary and water quality and management challenges contribute to the assessment phase, as outlined in the project programme below (**Figure 1**).

In the assessment phase of the project, Component 2 consists of two tasks that feed into the overall situation assessment and gaps analysis for water quality and water quality management challenges for South Africa. The first task is a high-level situation assessment to understand the impacts, topography and root causes of the water quality challenges facing the country. In order to meet the South Africa's development objectives, an approach to WQM should consider the importance of proactively planning in order to be prepared for the range of socio-economic and developmental requirements of the country. This requires a more informed understanding of the range of impacts, and provides the opportunity to fully understand the management regimes required (DWS, 2015). Similarly, an understanding of the water quality challenges in the country provides a good starting point for research, planning and management interventions. These water quality challenges affect the country in different ways, and therefore have different characteristics such as:

- the geographical extent of their impacts;
- the integrated severity of their impacts on the fitness-for-use of the resource, on water users' health, on the local and regional economy, and on local and downstream ecosystems;
- the extent to which they have been / are being monitored; and
- levels of knowledge and understanding of the above impacts, their temporal patterns and geographic prevalence.

In addition, an assessment of future trends as it relates to the expansion or contraction of dense settlements, the coal mining roadmap and its direction and shifts towards urbanisation, amongst others, will be used to further inform potential future water quality threats to SA's water resources. A SWOT analysis will also form part of the report to identify in particular areas for improvement

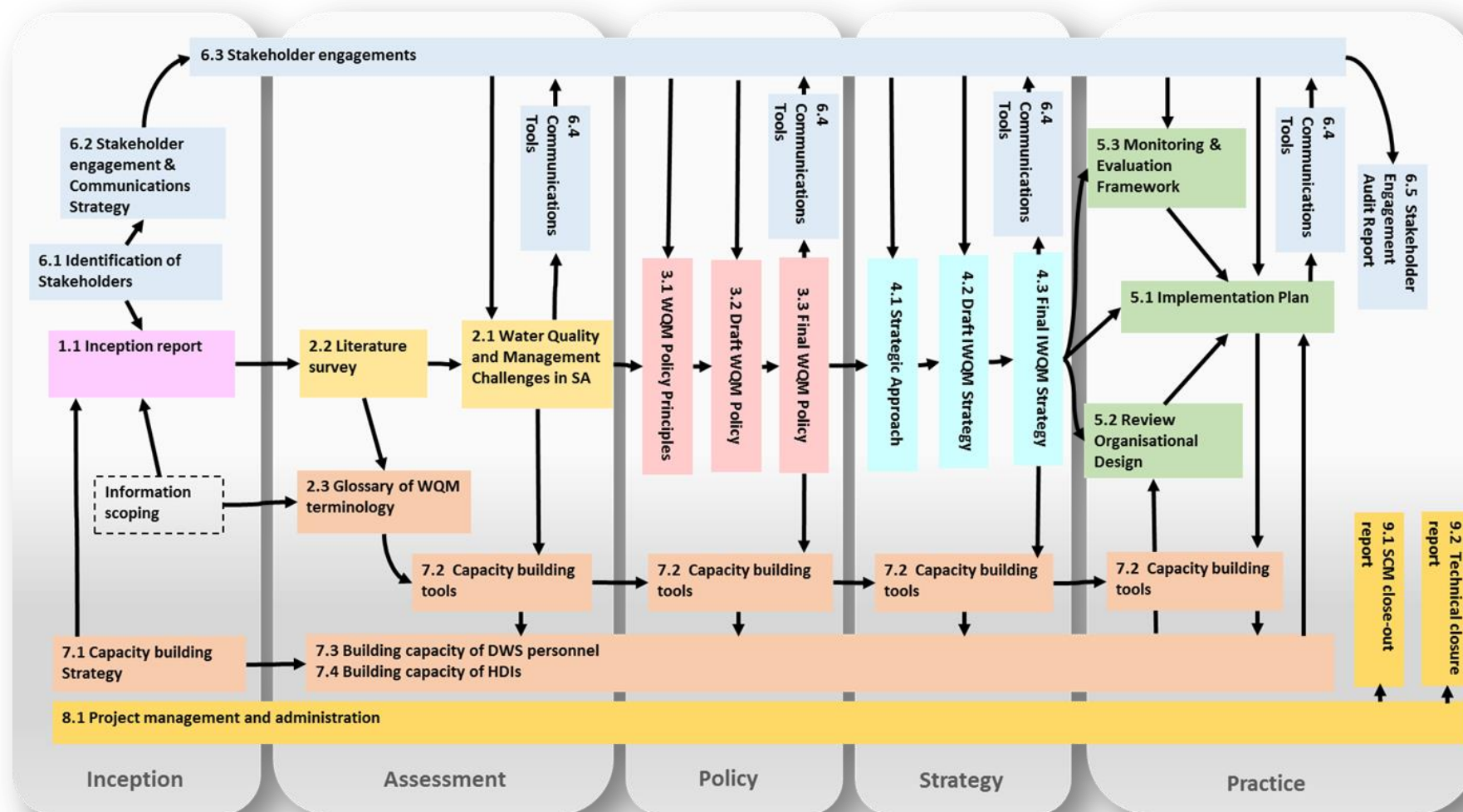


Figure 1: Project Phases

Some of the salient results from the first task are presented here. **Figure 2** depicts a graphical representation of the various water quality challenges in South Africa. These water quality ‘impacts’ of each of these challenges is mapped against the ‘knowledge and understanding’ of the challenge. It can be seen that five water quality issues occupy the High Impacts/High Knowledge area on the diagram, namely Eutrophication, Salinisation, Sedimentation, Acidification and Urban Pollution. This signifies that they should receive high priority management attention (DWS, 2016).

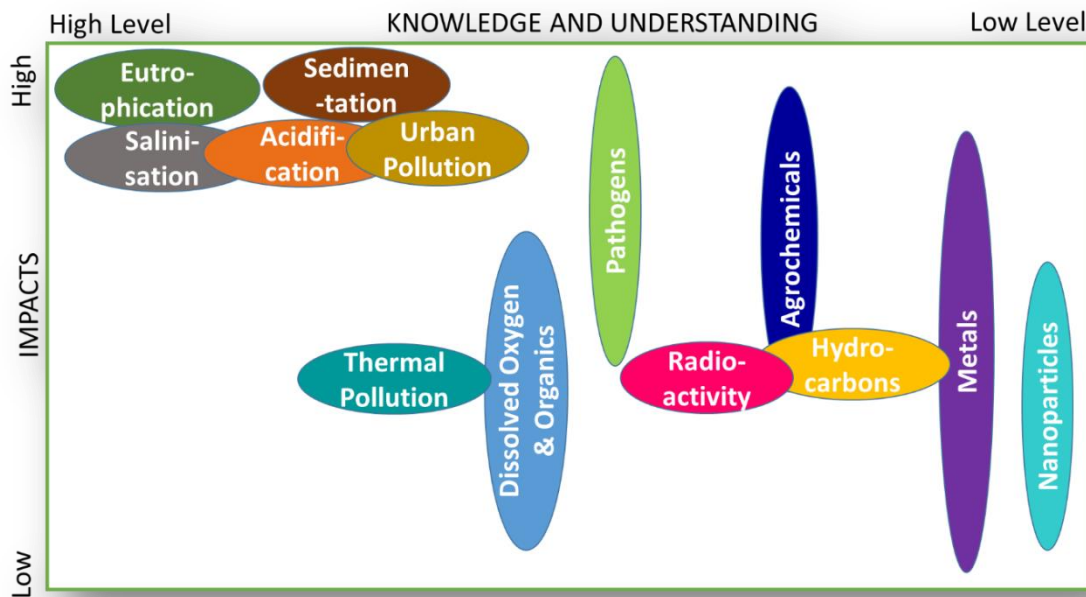


Figure 2: Mapping of water quality issues against Impacts and Knowledge/Understanding
(Source: DWS, 2016)

Understanding the root causes of these water quality challenges enables the implementation of effective WQM strategies and interventions. These challenges are exacerbated by climate change, incorporating a climate change lens enables the development of robust water quality management policy, strategy and implementation plans, which are adaptable and effective under changing environments. This, however, does not come easy, as the development of new ideas and thinking requires considerable political and strategic support in order to see these ideas becoming part of policy and strategy (DWS, 2015).

Although South Africa’s existing policies and strategies have an array of strengths and weaknesses, these need to be further explored in both the current and future context (particularly the climate, development, socio-economic context). Here-in lies the opportunities offered by innovative WQM interventions, as enables countries to not only address water quality challenges, but to also meet other country objectives. Such opportunities can be described as:

- Aiming for **sustainable development** and promoting the **green economy**.

- Forming **stewardships efforts and partnerships** that promote collaboration to manage shared risks.
- Alternative and innovative **financing mechanisms** that provide opportunities to support improved WQM (DWS, 2015).
- The **restoration and rehabilitation** of natural systems (including water resources) to their natural state and thus ensuring equitable access to water resources for all water users (which include the ecosystems).

There is, therefore, an opportunity for South Africa to review, revise and refine WQM policies and strategies to address the above-listed opportunities offered by innovative solutions. This necessitates an evaluation of the current states of WQM in South Africa, and most importantly the challenges and gaps in the country's current WQM approach. This will enable the country to implement solutions that will resolve current water quality challenges by resolving the barriers to progress. This forms the basis of the second part of Component 2: the Literature Review.

1.3 Purpose of the Report

The Literature Review consists of three parts: WQM Policies and Strategies, WQM Institutional Arrangements and WQM instruments for South Africa (**Figure 3**).

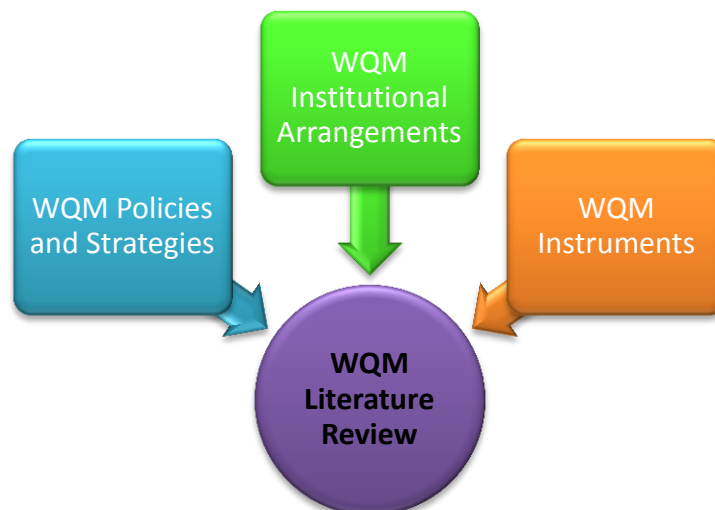


Figure 3: Components of the WQM Literature Review

This report, the third of the series, aims to provide a baseline understanding of the instruments that govern and manage WQM in South Africa. This is not an exhaustive list, but is an on-going deliverable and will be updated throughout the project as more information and analysis comes to light.

2. INSTRUMENTS FOR WATER QUALITY MANAGEMENT

The management of water quality in the country falls under the broader umbrella of water resources management and can be categorised under legal instruments and regulatory instruments. This Chapter explores both the legal and regulatory instruments responsible for the management of water quality in the country. These are expanded on below.

2.1 Legal Instruments

South African's most powerful legal instrument is that of the South African Constitution. Chapter Two of the Constitution of South Africa contains the Bill of Rights which is the human rights charter that protects the civil, political and socio-economic rights of all people residing in South Africa. Importantly, the Bill of rights apply to all law and bind all branches of the government, including the national executive, Parliament, the judiciary, provincial governments and municipal councils. Stemming out from this are the guiding policies on water and sanitation, which provide the framework on which the three Acts, viz. the Water Services Act, the National Water Act and the National Environmental Act are based. These Acts, together with the National Water Resources Strategy and the Strategic Framework for Water Services (**Figure 4**), are legally binding documents in South Africa to aid in the management of the country's water resources, and by default water quality.

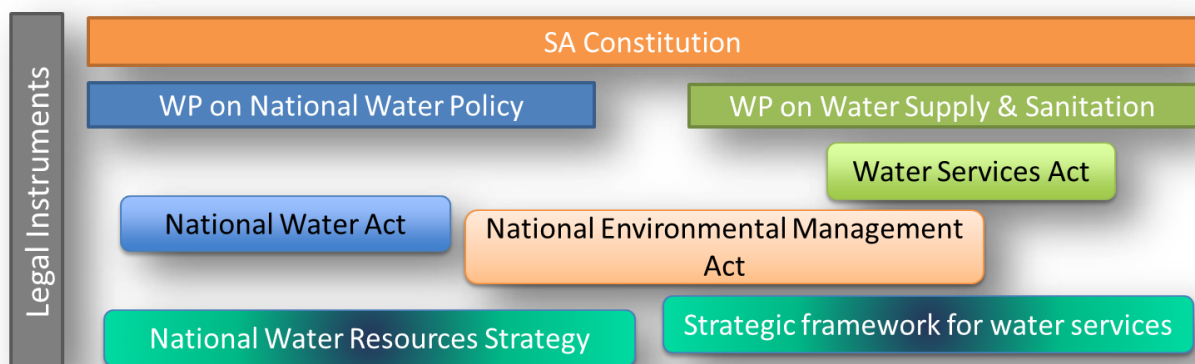


Figure 4: Legal Instruments for WQM in South Africa

2.1.1 Constitution of the Republic of South Africa, 1996

The Constitution caused a paradigm shift in South African environmental policy by providing a right to “***an environment that is not harmful to human health or well-being***”, and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures. These measures relate to the prevention of pollution and ecological degradation, the promotion of conservation, securing ecologically sustainable development and the utilisation of natural resources while promoting justifiable economic and social development. The constitution also calls for effective, transparent,

accountable and coherent government in a manner that does not encroach on the geographic, functional and institutional integrity of other spheres of government.

2.1.2 The Water Services Act, 1997

The Water Services Act, 1997 was promulgated to provide the legislative framework for the effective provision of water services, including for basic human needs. The Act is infused with the spirit of co-operative governance with the emphasis on building capacity at all levels of government. The Act places the responsibility on the different local authorities for service provision. The local authorities may make use of water services providers to ensure that the responsibility is fulfilled. The Act also regulates the use of water for industrial use in that water for industrial use may only be obtained from a source or the distribution system of a water services provider approved by the relevant local authority. The effluent produced by industrial use must also be disposed of as approved by the local authority.

If a local authority exercises any of the powers conferred on it in such a manner that it could result in the quality of the water in the water resources not being maintained fit for use, then the Constitution, National Water Act, 1998 and the Water Services Act, 1997 allow the Minister of the DWS to intervene by prescribing measures to be taken by the local authorities or water services providers or by taking measures themselves to ensure that the services are provided in such a way that the quality of the water remains fit for use. The intervention is not related to measures on the water service provision, but to ensure that the quality of the water stays fit for use.

2.1.3 The National Water Act, 1998

The National Water Act, 1998, is the primary statute, providing the legal basis for realising South Africa's water quality management policy. The Act stipulates that the water resource of the country is a national asset for which the National Government must act as public trustee. The water resource must be managed to achieve sustainable water use for the benefit of all users. The use of the water resource in a manner that meets basic human needs and provides for ecologically sustainable development, is enshrined in the Reserve, which enjoys priority by right.

The Act also requires protection of the quality of the water resource as well as integrated management of all aspects of the water resource. Participation of everyone in the management of the water resource must be promoted by the delegation of management functions to regional and catchment levels. In the management of the water resource, cognisance must be taken of international requirements.

The Act also states specific considerations with the issue of licences. These include the need to redress the results of past racial and gender discrimination, efficient and beneficial use of water in the public interest as well as the socio-economic impact of water use.

The National Water Act, 1998 also contains wide provisions particularly related to responsibility for the integrity of water resources. The basis of water management at mines is

therefore the mine water management hierarchy. This hierarchy is based on a precautionary approach and sets the following order of priority for mine water management Actions (Swart, 2003):

- Pollution prevention;
- Water re-use or reclamation;
- Water treatment; and
- Discharge.

2.1.4 The National Environmental Management Act, 1998

The National Environmental Management Act, 1998, gives legal effect to the internationally agreed principle of sustainable development. This aspect must be taken into consideration in all decisions that may affect the environment. In addition, the Act also provides for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote environmental governance and procedures for co-ordinating environmental management functions.

The Act also stipulates a number of principles providing the framework for environmental management. The principles of specific relevance to this framework policy can be summarised as follows:

- Environmental management must place people and their needs at the forefront of its concern
- Development must be socially, environmentally and economically sustainable
- Access to environmental resources, benefits and services to meet basic human needs and to ensure human well-being must be pursued
- Community well-being and empowerment must be promoted through environmental education and awareness
- Beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage.

The Act promotes sustainable development and sets national norms and standards for integrated environmental management (section 24) where all spheres of Government and all organs of State must co-operate, consult and support one another. Section 28 of the act also imposes a duty of care and remediation of environmental damage on any person who causes, has caused or may cause significant pollution or degradation of the environment. Furthermore, sections 32 and 33 of the act provide for legal standing to enforce environmental laws and private prosecution respectively (Swart, 2003).

2.1.5 The National Water Resources Strategy, 2004

The National Water Resources Strategy (2004) sets out the policies, strategies, guidelines and procedures for the management of water in the country, as required by the National Water Act, 1998 (No. 36 of 1998). The updated strategy, the National Water Resource Strategy 2 (NWRS-2), released in 2013, aims to “ensure that national water resources are managed towards achieving South Africa's growth, development and socio-economic priorities in an equitable and sustainable manner over the next five to 10 years.”

The strategy also responds to the priorities set by government in the National Development Plan (NDP) and National Water Act imperatives that support sustainable development. In terms of the NWA, the purpose of the National Water Resource Strategy is to:

- facilitate the proper management of the nation's water resources
- provide a framework for the protection, use, development, conservation, management and control of water resources for the country as a whole
- provide a framework within which water will be managed at regional or catchment level, in defined water management areas
- provide information about all aspects of water resource management
- identify water-related development opportunities and constraints

Under the NWRS-2 are a number of national thematic plans, including the National Climate Change Strategy for Water Resources (WCCS). The NWRS-2 has been described by the National Climate Change Response White Paper as setting out the short-term response to climate change, with the Water for Growth and Development Framework 2030 seen as the medium to long-term responses. It recognises that climate change will increase the pressure on already stressed water resources, and there is thus a crucial requirement for the effective management, use, allocation and re-allocation of available water resources.

2.1.6 The Strategic Framework for Water Services, 2003

This framework provides the approach for the provisioning of water services in South Africa, which ranges from compliance with water authorities to ensure appropriate drinking standards for potable water. All water services providers must develop a water services provider business plan. This plan is an annual operational plan which shows how the activities of the water services provider will support the achievement of the desired outcomes of the water services development plan by planning for water quality.

It should be noted that at the time of compiling this document, The Department has undertaken to amalgamate the NWA and the WSA. Furthermore, the NEMA and MPRDA have been amended to include mine water management.

and processes, some falling within the formal regulatory process, i.e. regulation as practiced by the state, and some falling within a more informal regulatory process, for example through the media, community pressure groups, consumer behaviour and so on.

Water resources regulation is a form of social regulation, aimed at the protection and equitable use of a common pool resource - water. Within water resources regulation, however, there three different types of regulation (Schreiner, 2011):

- ❖ **Technical regulation** - such as water quality or abstraction control, is related to, but distinct from the governance or economic regulation of water management and water services institutions. Technical water resources regulation refers to the control of activities that impact on a water resource.
- ❖ **Governance regulation** - has been coined in this study to refer to the regulation of the governance of subsidiary water institutions, such as catchment management agencies and water user associations. This includes regulation of such matters as whether Governing Boards are operating according to statutory and best practice requirements, whether adequate financial management systems and controls are in place, and that statutory requirements relating to business plans, audited financial statements, and annual reports are met.
- ❖ **Economic regulation** - refers to interventions in what are considered to be market decisions, such as pricing, competition, the entry to or exit from the market, and promoting economic efficiency.

The four categories of regulatory instruments for WQM are shown in **Figure 6** and are further described below.

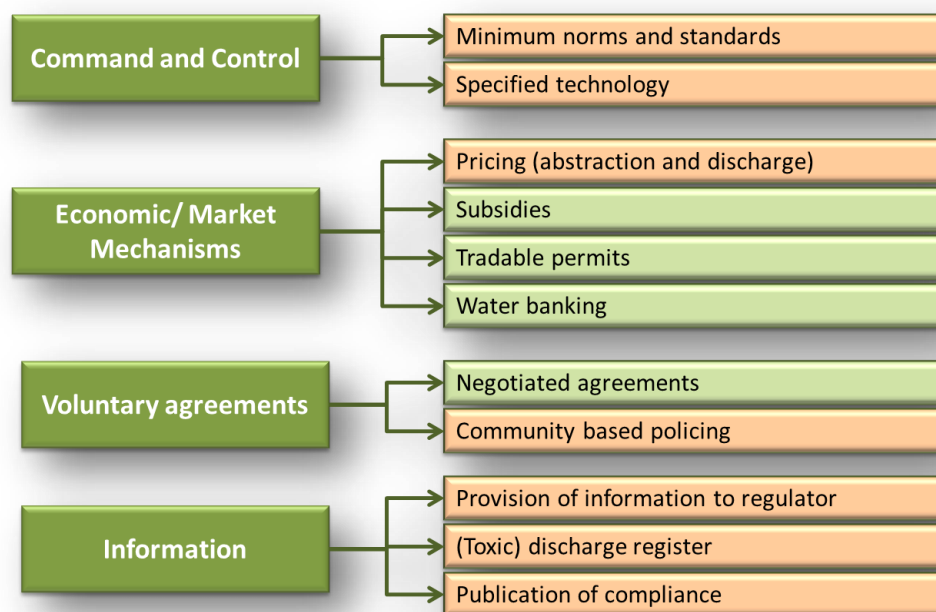


Figure 6: Categories of Regulatory Instruments (Schreiner, 2011)

2.2.1 Command and Control

The other main approach to WQM is regulatory, often referred to as "Command and Control" (CAC). Under the command and control approach to regulation, government prescribes specific guidelines or standards that regulated parties must comply with. There are various forms that such guidelines or standards can take, such as prohibitions on certain activities, licensing of regulated activities, setting of product or technical production standards (This may also include ISO 14 000 and NOSA), setting of performance standards and water use authorisations (General Authorisations and Licences). The Department also provides a Record of Recommendation to Department of Environmental Affairs related to Waste Management sites. Thus command and control regulation generally requires government to formulate standards, schedules for meeting the standards, permitting and enforcement procedures, and the development of penalties for non-compliance. It has the benefit of being fairly predictable in terms of the results that can be expected².

However, criticisms of controls which take the form of standards and guidelines are that they can be inflexible and stifle innovation, are vulnerable to evasion, costly to implement and result in enforcement difficulties (Schreiner, 2011).

2.2.2 Economic Mechanisms

While there are variations in the definition of economic instruments in the literature, UNEP (undated) offers the following definition: ***"a policy, tool or action which has the purpose of affecting the behaviour of economic agents by changing their financial incentives in order to improve the cost-effectiveness of environmental and natural resource management."***

Since the inception of environmental policy in most industrial countries, governments have tended to use these instruments as their main strategy for controlling pollution. Many countries, however, are becoming aware that regulatory instruments are inefficient for achieving most pollution control objectives, and that the level of expenditure required to comply with increasingly stringent environmental laws and regulation is becoming a major cost of production (WHO, 1997). Economic instruments have been described as promising tools for advancing sustainable development and therefore, WQM.

In the area of water quality, economic instruments hold potential to speed adjustment towards optimal outcomes and stretch available resources. But there is devil in the detail. To be effective they must be well designed and, in particular, there must be adequate investment in science and in the administrative arrangements necessary to make them work.

Often these instruments need also to be supported by the development of standards, regulation and other instruments. Economic instruments are rarely a substitute for regulatory

² UNEP undated

and other approaches. They just make it possible to achieve desired environmental outcomes at less cost.

The Waste Discharge Charge System (WDCS) that was developed by the Department to promote waste reduction and water conservation was one such economic instrument. It forms part of the Pricing Strategy, which is being established under the National Water Act (Act 36 of 1998). The WDCS is based on the polluter-pays principle and aims to:

- promote the sustainable development and efficient use of water resources;
- promote the internalisation of environmental costs by impactors; and
- create financial incentives for dischargers to reduce waste and use water resources in a more optimal way.

The WDCS was premised on resource quality objectives (RQOs) as the measure of acceptable risk, and seeks to achieve RQOs at lowest total cost to the catchment. Where RQOs are exceeded or are threatened, impact on the resource is unacceptable and the WDCS may be deployed to achieve RQOs. The system will be applied at a catchment scale where the catchment is defined as those areas that have a significant impact on water quality, or are impacted by the specific water quality problem.

One key finding was that the difficulty in measuring actual outcomes of interest for diffuse source water quality issues has made application of economic instruments particularly challenging.

2.2.3 Voluntary Agreements

Voluntary regulation is an important addition to the suite of instruments that can be used to achieve regulatory objectives. There are four main types of voluntary regulation:

- i) environmental agreements negotiated between regulators and industry;
- ii) public programs (administered by regulators or third parties) that individual firms are invited to join;
- iii) public disclosure initiatives that collect and disseminate information on participants' environmental performance; and
- iv) unilateral commitments made by firms³.

While voluntary regulation is used in both developed and developing countries, there is disagreement on how effective it has been in developing countries. One view is that voluntary regulation sidesteps the challenges of weak institutions, weak legal frameworks and limited political will and relies partly on the pressure placed on polluters by consumers, markets, non-governmental organisations, and community groups and the potential for an improved profile as a result of environmental improvements (Schreiner, 2011). However, a second school of thought is less convinced that voluntary regulation is effective in developing

³ Khanna 2001 in Blackman 2008

countries, partly because of weak regulatory and non-regulatory pressure on companies. Research suggests that the threat of mandatory regulation often pushes firms to take part in voluntary regulatory initiatives⁴, so that the incentive to take part is lower with weaker mandatory regulation.

Whatever the case may be, it is clear that without a culture of self-regulation for water quality management in South Africa, the onus simply lies at the door of the Department, instead of being a shared responsibility with multi-sectoral participation. Most of the large water users, be they mines, industry or water treatment works, have sets of standards that they have to comply with in their processes, as well as their discharge standards (DWAf, 2011).

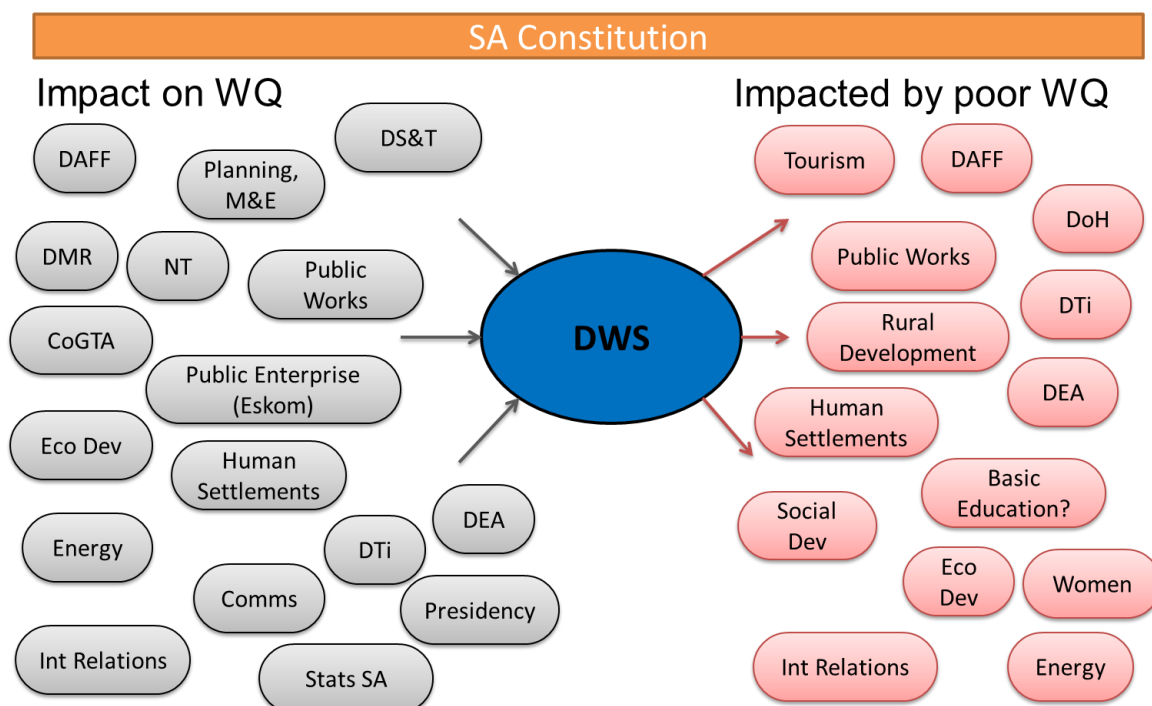


Figure 7: Diagram showing Departments which are impacted by, and impact on, water quality

The shared responsibility of the water resources also extends to other governmental departments, specifically because water quality management in South Africa is so diverse and complex. It requires strong institutional capacity (well-trained resources, active, effective systems and appropriate finances) at a national and regional level as well as cooperative governance with the various Departments that both impact on and are impacted by water Quality (**Figure 7**).

⁴ Khanna, 2001

2.2.4 Information

While adequate information is a prerequisite for all forms of regulation, and the exercise of all regulatory instruments, it can also be used as a regulatory tool in its own right⁵. Requiring water users to disclose information can provide a useful way for authorities to collect information. Equally, if the information is made public, such disclosure can also give the public access to the information and provide for monitoring and control both by the authorities and by public pressure. The collection of information also signals to water users that the authorities are taking their regulatory role seriously.

Information disclosure can take several forms such as certification of products, firms, processes, or management procedures, usually by independent agencies; self-certification, without independent review; or the provision of raw data to the authorities⁶. In the South African context, the Blue Drop/Green Drop certification system for municipalities has proved the regulatory value of the reporting and disclosure of information, with specific regards to water quality monitoring.

❖ NIWIS

The National Integrated Water Information System (NIWIS) is a recent development at the Department which gives real time status updates of various aspects related to water resource management. Importantly, the NIWIS website also provides key information related to Water supply, Water quality monitoring network, drought status amongst others.

The NIWIS System consists of a set of dashboards to enable managers to make a quick assessment of the water situation in South Africa. The NIWIS Dashboards represent the data in an interactive manner that is user friendly and easy to navigate and understand⁷.

NIWIS aims to serve water information through a number of easy to understand dashboards, without getting into too many technical details.

The dashboards are designed to give an overview at National level, Provincial or WMA level, and where possible at the level of individual items (e.g. dams, weirs etc.). NIWIS will be a living system, not only is it plausible, but also encourages that new ideas emerge to improve the dashboards over time. The system is a living system, and will undoubtedly improve as more information, monitoring networks and links to other existing DWS platforms become available.

In terms of water quality, the system aims to answer the following questions:

- What problematic water quality constituents pose the greatest risk to human health in areas
- Where they are routinely measured?

⁵ Lopez et al 2004

⁶ Ibid

⁷ http://niwis.dwa.gov.za//UserFiles/niwis/html/Public_P3C2_IMP2_NIWIS_User_Manual.pdf

- Where do we know that drinking untreated water may be risky? (The dashboard includes a map of communities to give an idea of where people are likely to be exposed to risk.)
- What are the trends of the problem constituents at sites where routine measurements are available?

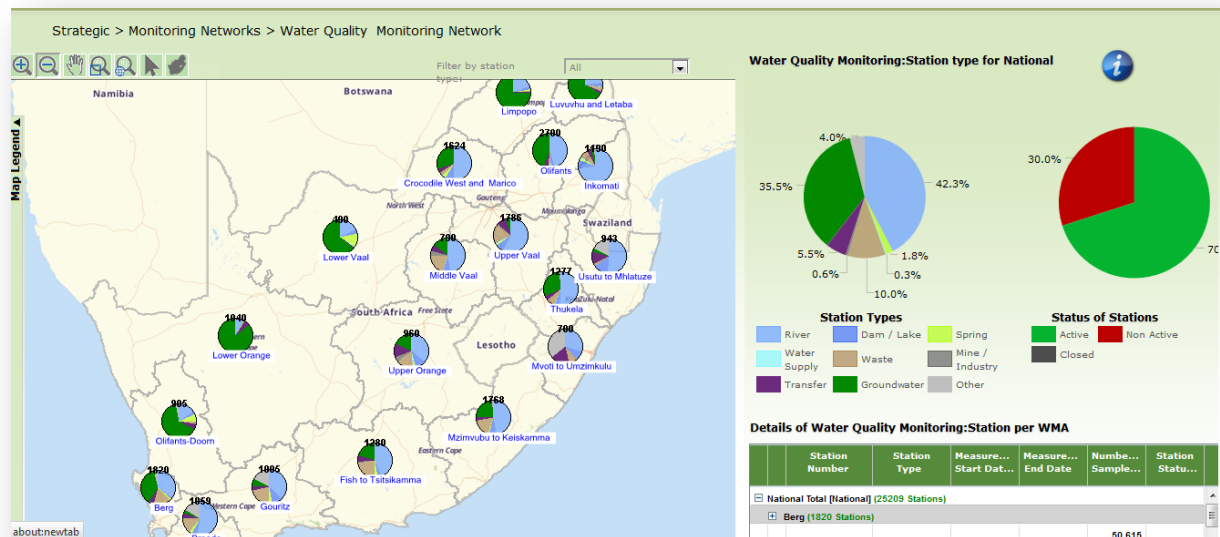


Figure 8: National Water Quality Monitoring Network⁸

3. THE DEPARTMENT OF WATER AND SANITATION'S MANAGEMENT APPROACH TO WATER QUALITY

“Water resources management has often focused on satisfying increasing demands for water without adequately accounting for the need to protect water quality and preserve ecosystems and biodiversity.” (DWS, 2015)

Water in South Africa is a limited and a vulnerable resource. Its vulnerability stems from several factors such as extreme climate variability, increasing degradation of the water resource due to over-utilisation and associated water resource-adverse land-use practices, mainly attributable to an increase in population. The situation is further compounded by the loss or degradation of wetlands and related areas, which are key in sustaining and rejuvenating the water resource

3.1 The Approach

Currently, the Department's approach to the protection of the resources is two-pronged: Resource Directed Measures (RDM) and Source Directed Measures (SDM). Resource directed measures set the goals for resource protection and are informed by the Water Resource Classification system, which allows for different levels of protection for different water resources. The RDMs also make provision for the “Reserve”, defined as the quantity and quality of water required to maintain a healthy aquatic ecosystems, whilst meeting the basic human requirements. Sensitive receiving environments, like dolomitic groundwater resources, and rivers with a high conservation value will receive greater management attention, and pollution sources in these areas may be required to implement more stringent management.

In addition, the National Water Act specifies that Resource Quality Objectives (RQOs) will be established for different water resources; this process is currently underway for the Upper Vaal and Olifants basin. These are aimed at specifying appropriate numeric and narrative objectives for different water resources, and can include indicators of water quality, as well as the biological and physical characteristics of the resource (DWAF, 2002).

The National Water Act dictates that water resources management practices and strategies must give effect to the Reserve, the RQOs, and to the Water Resource Classification system. In the absence of the RQO's, certain catchments have implemented the agreed Resource Water Quality Objectives (RWQO's).

The key components to effective water quality management include the effective co-ordination between the various planning, information management, monitoring and source directed control activities (such as water use licensing and compliance monitoring and enforcement) and well as engagement with stakeholders (DWS, 2015). Given that water quality management considers the collective impact of land use and water use processes, coordinated planning and action is required not only within the Department but at all levels, from national government through provincial and local authorities to individual landowners

and affected stakeholders, such as civil society. The provision and implementation of clear policies, strategies and plans, which provide the necessary direction to the Department as well as the larger water sector, for the effective, equitable, sustainable and integrated management of South Africa's surface and ground water quality is paramount for the management of the resources.

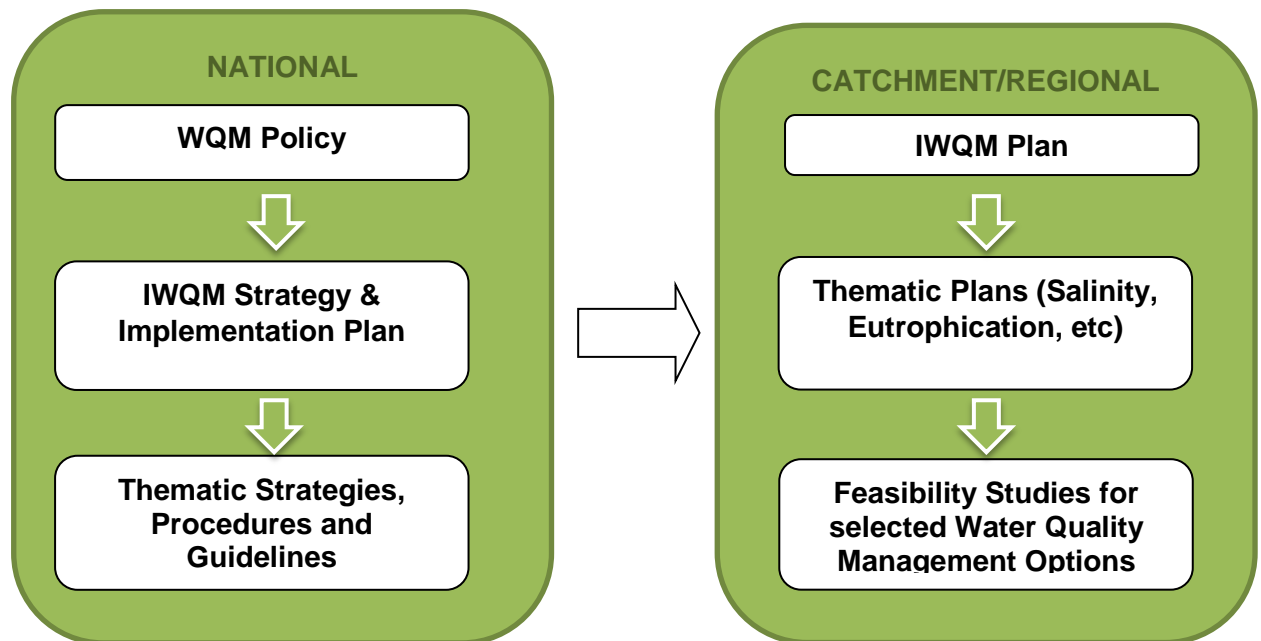


Figure 9: Hierarchy of WQM Instruments at National and Catchment/Sub-Catchment Scales

Currently, water quality is currently managed and controlled by the Department through the application of a number of management instruments. These are inter alia the Water Quality Management Policy and Strategy for the RSA (DWAF, 1991), the Resource Directed Management of Water Quality Policy and Strategy (DWAF, 2006), the Policy and Strategy for Ground Water Quality Management (DWAF, 2000), the National Water Resource Monitoring Strategy (DWAF, 2004), Regulation 810, which developed a system for the classification of water resources (DWA, 2010), Best Practice Guidelines for Water Resource Protection in the South African Mining Industry (DWAF, 2006) and the Blue and Green Drop Initiative and Reports (DWA 2009 and DWA 2010). How these instruments fit into the management approach is illustrated in **Figure 9** (DWS, 2015).

3.2 Integrated Water Resource Planning

The Department's Integrated Water Resource Planning (IWRP) component provides the required Resource Planning and Management cohesion that links Resource Objectives with Water Use Management (**Figure 10**). Within the Department's IWRP function WQP is focused on "connecting" Resource Water Quality Objectives with water quality Water Use Management, and hence, it functionally fulfils the coordination role from a water quality perspective.

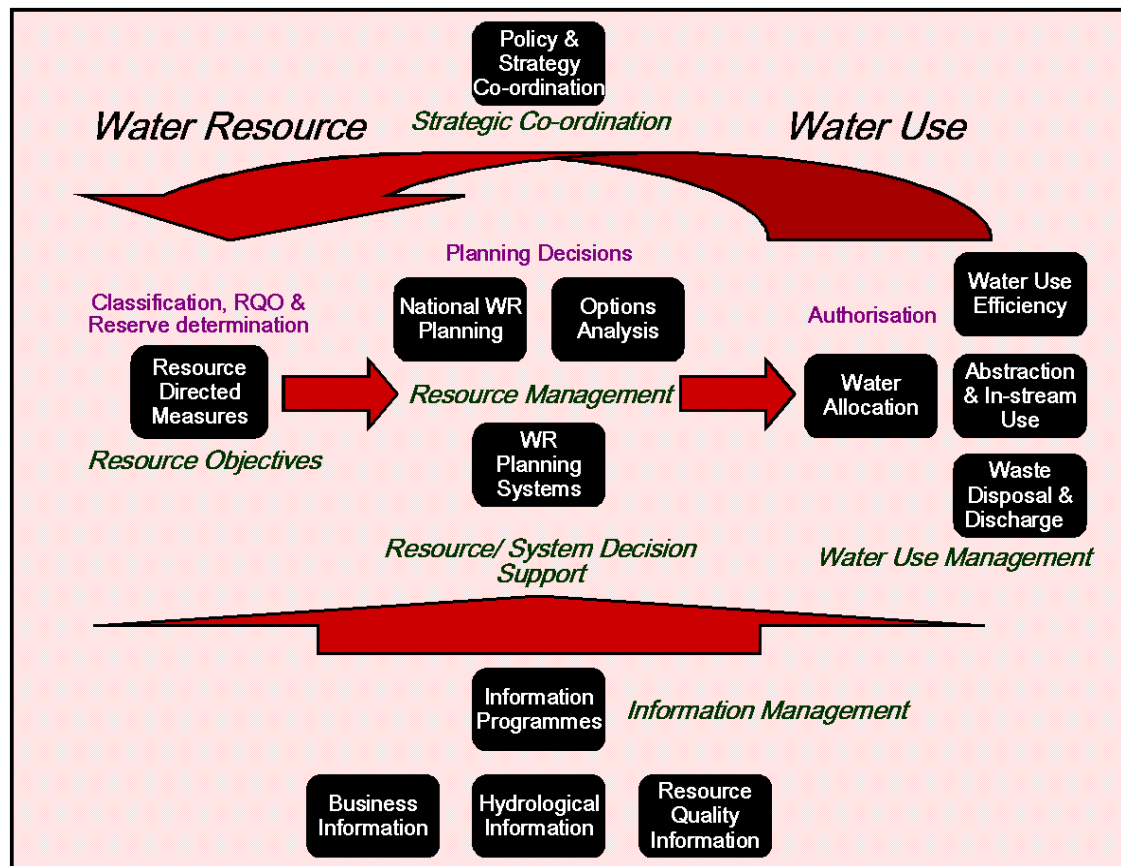


Figure 10: Water Quality Planning in DWS

3.3 National Water Resource Classification System

Resource Directed Measures, together with Source Directed Controls are the key strategic approaches designed under the National Water Act (NWA) (Act 36 of 1998) to achieve equity, sustainability and efficiency in Integrated Water Resources Management in South Africa. These measures comprise the classification system, the Reserve and Resource Quality Objectives. Together they are intended to ensure comprehensive protection of all water resources.

The Water Resource Classification System (WRCS), which is required by the NWA, is a set of guidelines and procedures for determining the desired characteristics of a water resource, and is represented by a Management Class (MC). The Management Class outlines those attributes that the custodian (DWS) and society require of different water resources. The WRCS is a consultative process to classify water resources (Classification Process) to help facilitate a balance between protection and use of the nation's water resources. The outcome of the Classification Process will be the Minister or her delegated authority setting the MC and Resource Quality Objectives (RQOs) for every significant water resource (river, estuary, wetland and aquifer) which will be binding on all authorities or institutions when exercising any power or performing any duty under the NWA.

Only three management classes are acceptable, Class I: Minimally Used, or Class II: Moderately Used, or Class III: Heavily Used.

The management classes essentially describe the desired condition of the resource, and conversely, the degree to which it can be utilised. In other words, the MC of a resource sets the boundaries for the volume, distribution and quality of the Reserve and RQOs, and thus the potential allocable portion of a water resource for off-stream use. The Classification Process is not carried out in isolation, but is integrated within the overall planning for water resource protection, development and use. A key component of classification is therefore the on-going process of evaluating options with stakeholders in which the economic, social and ecological trade-offs will be clarified and decided upon (DWAF 2011). To date a suite of instruments have been developed to support this. The challenge that is now to be faced is the implementation of these instruments.

3.4 W.A.R.M.S.

With the limited water resources in the country, it becomes crucial to understand how much water is used, by whom, and where. The NWA gives the Department of Water and Sanitation the tools to gather the information that we need for the optimal management of our water resources⁹. The registration of water use is one of these tools and the Department utilises the Water Authorisation and Registration Management System (WARMS) for such purposes. The registration aids the Department:

- To manage water resources;
- To ensure fair share allocation;
- To protect the environment; and
- To enable the Department to charge for water.

Registration of water use is compulsory to all the authorization types, viz. general authorizations, licenses, and existing lawful water use.

3.5 e- WULAAS

All water users, who do not receive their water from a service provider, local authority, water board, irrigation board, government water scheme or other bulk supplier and who are using water for irrigation, mining purposes, industrial use, feedlots, or in terms of a General Authorisation, e.g. Individuals (i.e. farmers, small-holders, land-owners or lessees); Communities (i.e. communal enterprises, traditional farmers groups); National or Provincial Government; Companies and businesses (i.e. including partnerships, public, privates, companies not for gain, foreign companies, closed corporations etc.); Water User Associations and Water Services Providers, including Water Boards and Local Government (DWAF. 2007). The water use **registration** process is different from the water use

⁹ <https://www.dwa.gov.za/Projects/WARMS/>

authorisation process. Registration is the process of officially notifying the Department of a water use. One registers existing water use, General Authorisation (GA), and/or a licensed water use.

Unauthorised water use is illegal and constitutes an offence in terms of section 151(1) of the NWA. A person may be authorised to use water:

- If the water use is permissible in terms of Schedule 1 of the NWA, or
- As a continuation of an existing lawful use, or
- If authorised by a GA, or
- If licensed to do so in terms of the NWA.

The following are approached as waste-discharge type water uses:

- Section 21(e) Engaging in a controlled activity: irrigation of any land with waste or water containing waste generated through any industrial activity or by a waterwork.
- Section 21(f) Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit.
- Section 21(g) Disposing of waste in a manner which may detrimentally impact on a water resource.
- Section 21(h) Disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation.

There are generally 6 steps to processing any licence. These steps aim to test the application against the principle of "beneficial use in the public interest", and specifically against Section 27 of the NWA. These steps are:

❖ **Step 1 - Pre-Application process**

This is done when your licence application is received, and is used to check if everything needed to process the licence is available. You will be asked to provide missing information, and may get initial feedback before you pay your application fee - so you can decide whether to continue.

❖ **Step 2 - Initial assessment and grouping.**

This includes a quick assessment of the possible impacts and benefits of the proposed water use. In some cases a simple set of questions will be used to help make this assessment.

❖ **Step 3 - Regional Assessment.**

This step is done in the regional office where you made your application. The regional office gathers all the information required to make a decision on whether to approve the application, and makes a recommendation to the national office.

❖ **Step 4 - Evaluation by the National Office.**

Your application is then evaluated by specialist groups. These groups also make recommendations on the application. The application is then submitted to the Delegated Authority for a decision.

❖ **Step 5 - Decision by the Delegated Authority**

After considering all the relevant information, the Chief Director: Water Use will make a decision on whether to approve the application.

❖ **Step 6 – Implementation**

Once a decision has been made, the Regional Office will be informed, and they can start with implementing the licence. They will then inform you of the outcome of the application, and if approved will issue you the licence as well as highlighting any conditions that might be attached to your water use.

A licence for the authorisation of water use(s) can take anything from 3 to 12 months to process, depending on the complexity of the licence, its benefits to the nation, and its possible impacts. Generally, low impact, high value licences will be processed quicker.

The Electronic Water Use Licence Application and Authorisation System (e-WULAAS) is aimed at streamlining this process.

3.6 Integrated Water User Licence

The responsibility for environmental protection currently lies with both the Department of Water and Sanitation and the Department of Environmental Affairs, with both the National Water Act of 1998 and the National Environmental Management Act of 1998 being used to protect resources. Thus, the NWA and the NEMA set out the parameters for regulation, including the institutional arrangements and regulatory instruments. The primary instrument to ensure that resources are taken into account as far as new projects in South Africa are concerned is the Environmental Impact Assessment (EIA) (Brownlie, Coetzee, Morris, 2013^[1]).

Although project-level EIA does contribute to some extent to providing assurance of sustainable development, there are a number of challenges: i) there is a low level of coordination and collaboration by key authorities regarding environmental management at a strategic level; ii) many projects are authorised although they do not ensure sustainable development, that is, EIA practice is largely dictated by procedural and reporting requirements in the NEMA EIA Regulations and does not really engage with key sustainability issues; iii) integrated decision-making and cooperative governance is not occurring; iv) there was discussion of moving environmental regulation from DEA to the key

^[1] <http://pmg-assets.s3-website-eu-west-1.amazonaws.com/130731ladies.pdf>

impacting sectors, and if this occurs there will be conflict of interest (Brownlie, Coetzee, Morris, 2013^[2]). The mining sector, in particular, has been problematic.

There is a need to align the processes, for example, for requiring a mining licence, and there has been participation in the Interdepartmental Project Implementation Committee (IPIC) on integrating licencing. To ensure that the authorisation processes associated with mining are aligned, all four acts (NWA, NEMA/NEMWA and MPRDA) need to be amended and aligned.

The real opportunity exists to look at improved cooperative governance arrangements between sectors that could strengthen regulatory powers across the sectors.

Action:

- i) *Sustainable development and cooperation between government departments in order to assure sustainable development needs to be given more importance;***
- ii) *In revising the National Water Act of 1998 and National Environmental Management Act of 1998, the processes for requiring licences need to be aligned between DWS, DEA, DMR and DAFF, where necessary. (IWUL)***

^[2] <http://pmg-assets.s3-website-eu-west-1.amazonaws.com/130731ladies.pdf>

4. CONCLUSION

This report has highlighted a number of instruments that the Department has at its disposal and discusses its approach to water quality management. While the list is not exhaustive, it provides a good framework for WQM in South Africa. As with the review of WQM Policies and Strategies, the crux is trying to determine the gaps and challenges with the WQM Instruments. Armed with this baseline knowledge, the team is able to probe further, specifically at those tasked to implement these instruments to understand what is and is not working, what is missing and well as what needs to improve.

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