Integrated Water Quality Management POLICIES AND STRATEGIES FOR SOUTH AFRICA

1.2.2 A REVIEW OF THE WATER QUALITY MANAGEMENT INSTITUTIONAL ARRANGEMENTS FOR SOUTH AFRICA



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Department: Water and Sanitation REPUBLIC OF SOUTH AFRICA



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Water Resource Planning Systems Water Quality Planning

WATER QUALITY MANAGEMENT POLICIES AND STRATEGIES FOR SOUTH AFRICA

A REVIEW OF WATER QUALITY MANAGEMENT INSTITUTIONAL ARRANGEMENTS FOR SOUTH AFRICA

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PREFACE

Background

South Africa is facing a multi-faceted water challenge, which, if not addressed effectively, has the potential to significantly limit the economic growth potential of the country, especially considering the levels of water scarcity, with frequent droughts, increasing water demands, and deteriorating resource water quality.

The deterioration in water quality is a factor of growing concern. Importantly, **deteriorating water quality is an economic and developmental issue**, and should be addressed as such. Without a change in how water resources are managed, worsening resource water quality will continue to erode the socio-economic benefits from, and increase the costs associated with, the use of the country's water resources.

In light of the above, the Department of Water and Sanitation (DWS) embarked on a journey to revise, update and consolidate its policies and strategies for managing the quality of the water in the Country's water resources and to develop a pragmatic plan for the conversion of the Integrated Water Quality Management (IWQM) Policy and Strategy into practice.

Integrated Water Quality Management Policy and Strategy

Since the inception of this initiative, several supporting documents were developed that aimed to establish the status quo with respect to water quality, its management practices and instruments, the challenges in South Africa and the institutional arrangements. A review of existing policies, strategies, and other relevant documents, both locally and internationally was used to i) analyse the root cause of the water quality issues; ii) determine the gaps in the IWQM approaches that have been used; iii) understand impacts that emerging trends may have on water quality (e.g. climate change, unconventional gas exploration, amongst others) and iv) look for innovative practices for IWQM.

Based on these learning's, the **IWQM Policy** sought to amalgamate and describe an integrated, inclusive and adaptive approach to IWQM, that built on the tenets of sustainable development coupled with addressing the identified gaps in the policy framework. The IWQM Policy sets out the vision, goal, values, underlying principles and policy responses for managing the quality of our water in our surface and underground water resources.

The **IWQM Strategy** sets out those strategic actions which are required to be undertaken in order to realise the vision and goals for water quality in South Africa. It articulates the broader process of Integrated Water Quality Management and provides the prioritised strategic actions that need to take place over a short to medium term.

The Implementation Plan outlines the pragmatic approach to strategic implementation and clearly articulates roles and responsibilities, resource (financial and human capacity) requirements and linkages and dependencies between key activities.

The Monitoring and Evaluation Framework articulates the indicators to be monitored to determine the progress of the actions to be implemented and provide the foundation required

to manage water quality adaptively. It also outlines the reporting structures and processes to be followed.





The Literature Reviews inform all three phases represented above.

Stakeholder Engagement

Given that the management of water quality constitutes an effort that is serviced and maintained by various role-players, a key element of the development of the IWQM Policy, Strategy and Implementation Plan is the involvement of relevant role-players, at a level where they may provide strategic and operational direction in the conceptualisation and finalisation of key areas and outputs. Consequently, a Stakeholder Consultation and Communication Strategy was developed to inform, consult, involve, collaborate and where possible empower the relevant key players by providing a strategic framework to: -

- Engage in policy and strategy development processes of the key issues, priorities, guiding principles, and approaches regarding the IWQM Policy and Strategy.
- Enhance the product through inputs from stakeholders;

- **Establish Ownership and buy-in** of both the process and outcomes to ensure that stakeholders can relate and identify with the IWQM Policy and Strategy;
- **Facilitate Implementation:** a key result under this objective is the implementation of the Policy and Strategy. This will involve iterative process of learning-by-doing approach so that the implementation of the Policy and Strategy can serve as both a refining process and a learning curve;
- Provide capacity development and support through strategic collaborative efforts. This
 ensures that the necessary skills and capacities are shared between and among
 stakeholders;
- Create awareness and enhance the level of understanding on issues about the IWQM Policy and Strategy, in order to improve and strengthen active stakeholders' participation in WQM;
- **Consider appropriate mechanisms** for communication and publicising of the IWQM Policy and Strategy.

Based on the fact that IWQM has environmental and social impacts, among others, it was imperative that consultation not be a single conversation but a series of opportunities to create an understanding about WQM amongst those it will likely affect or interest, and to learn how these internal and external parties view the initiative and its associated risks, impacts, opportunities, and mitigation measures. Listening to and incorporating stakeholder concerns and feedback is highly considered as a valuable source of information that can improve the design and outcomes of policy and strategy and help identify and control external risks. It is envisaged that the consultations done during this initiative form the basis for future collaboration and partnerships.

The Stakeholder Consultation and Communication Strategy focussed internally to relevant Government Departments and externally to targeted stakeholders.

- Internal to Government The purpose of targeting members within the Government Departments and its institutions (CMAs, Water Boards and other water management institutions) was to ensure that there was holistic preparation of staff at all levels. These staff have a range of interests that function at differing strategic levels within the Government and as such have different capacity building requirements.
- External to Government There are a range of stakeholders that are interested and affected by the IWQM Policy, Strategy and Implementation Plan. These include the private sector, research and academia, civil society including Non-Governmental Organisations, umbrella organisations such as the South African Local Government Association (SALGA), the South African Cities Network (SACN), the Chemical and Allied Industries Association (CAIA), Business Unity South Africa (BUSA), AgriSA, the Chamber of Mines, amongst others. The purpose of targeting these stakeholders was to solicit their input, create awareness and guide external stakeholders on water quality management issues, strengthen the understanding of the policy, and strategy and their implications, and strengthen collaborative systems. Moreover, it is important for the successful

implementation of the policy and strategy that external stakeholders become more engaged in both developing the policy and strategy as well as through the implementation of the policy and strategy.

Way Forward

As sector lead, the Department understands that the management of water resources requires a sector-wide approach and this is a central theme to the implementation of the National Water Resources Strategy. Similarly, the management of water quality requires that a broader engagement that moves roles and relationships beyond that of user, stakeholder, Policy-maker and regulator, but towards one of cooperation, partnership and stewardship. This necessitates the development of robust and pragmatic management instruments, supported by effective communication and capacity building, both internally to the Department and externally to the larger sector.

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Reports developed as part of this project:

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1.2.1	A Review of the Water Quality Management Policies and Strategies for South Africa and International Experience	P RSA 000/00/21715/2
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4.2	Implementation Plan - Edition 2	P RSA 000/00/21715/19
4.3	Monitoring and Evaluation Framework - Edition 2	P RSA 000/00/21715/20
4.4	Water Quality Management in the Department of Water and Sanitation: Organisational Design	P RSA 000/00/21715/21

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Afred Nzo District Municipality Afri Forum African Rainbow Minerals Agri Eastern Cape Agri Kwa-Zulu Natal (Kwanalu Initiative) Agri Northern Kaap Agri SA Agri Western Cape Agricultural Research Council Alliance for Water Stewardship Amatola Water Anglo American AquaEco ASA Metals Association of Cementitious Material Producers Award Bloem Water **Bosch Capital** Breede-Gouritz Catchment Management Agency Buffalo City Metropolitan Municipality Centre for Environmental Rights Chamber of Mines Chemical and Allied Industries' Association Chris Hani District Municipality City of Cape Town Metropolitan Municipality City of Johannesburg Metropolitan Municipality City of uMhlathuze Clean Stream Environmental Consulting Council for Geoscience (CGS) Council of Scientific and Industrial Research Crocodile River Irrigation Board De Beers Department of Energy Department of Environmental Affairs Department of Health Department of Higher Education and Training Department of Human Settlement Department of International Relations and Cooperation Department of Mineral Resources

Department of National Treasury Department of Planning, Monitoring and Evaluation Department of Public Enterprises Department of Rural Development and Land Reform Department of Science and Technology Department of Tourism Department of Trade and Industry Department of Water and Sanitation DH Environmental Consulting (Pty) Ltd **Digby Wells** East Rand Water Care Company Eco Monitor Eco- Owl Consulting Emifula Riverine Consultants Endangered Wildlife Trust EOH Coastal and Environmental Services Fskom Ethekwini Metropolitan Municipality Exova BM TRADA Exxaro Federation for a Sustainable Environment Federation of Southern African Gem and Mineralogical Societies. Fezile Dabi District Municipality Frances Baard District Municipality Free State Department of Agriculture and Rural Development Free State Department of Health Fresh Produce Exporters Forum Freshwater Consulting cc Galago Environmental Gamtoos Irrigation Board Gauteng Deptartment of Health Geo Arc Glencore Goadex Engineering and Water Science Consultants **Golder Associates** Goldfields Govan Mbeki Municipality Green Cape Sector Development Agency Manten Marina

Harmony Mines	Marico River Conservation Association
Limpopo Department of Agriculture and Rural Development	Masilonyana Municipality
Ikamva	MBB Consulting Services
Iliso Consulting	Merafong City Local Municipality
Impala Platinum	Midvaal Water Company
Inkomati Usuthu Catchment Management Agency	Modikwa Platinum Mine
International Water Management Institute	Mogalakwena Local Municipality
iSAT	Mogalakwena Mine
Isiqalo Cooperative	Moses Kotane Local Municipality
Jaco Consulting	Mpumalanga Water Caucas
Jantech	Municipal Infrastructure Support Agent
JCP Steel	Mzimvubu -Tsitsikamma proto CMA
JG Afrika	Nala local municipality
Joe Gqabi District Municipality	Naledi Local Municipality
Johannesburg Water	Naledzi Environmental Consulting
Joint Water Forum	National African Farmers' Union
Jones & Wagener	National Business Initiative
Kaap River Irrigation Board	Nepad Business Foundation
Kakamas Water User Association	New World Water Sanitation
Komati Basin Water Authority	North West Department of Rural, Environment and Agricultural Development
Komati River Irrigation Board	North West University
Kumkani FM	Northern Cape Department of Agriculture and Land Reform
KwaDukuza Local Municipality	Northern Cape Department of Environment and Nature Conservation
Kwa-Zulu Natal Agricultural Union	Northern Cape Provincial Government
La Brie Estate	Ntuzuma Enviro Cooperative
Land bank	OR Tambo District Municipality
Lebalelo Water User Association	Orange Proto-Catchment Management Agency
Lemogang womens health	Oranje-Riet Water User Association
Lepelle Northern Water	Overstrand Municipality
Lephalale Local Municipality	Palabora Copper
Letaba Water User Association	Petra Diamonds
Letsemeng Local Municipality	Phumelela Local Municipality
Liberty NPO	Pilanesberg Platinum Mines
LIM 368 (Mookgophong LM and Modimolle LM)	Pioneer Foods
Limpopo Department of Economic Development, Environment and Tourism	Platmines SA
Limpopo Proto-Catchment Management Agency	Polokwane Local Municipality
Living Lands	Pongolo-Umzimkhulu Proto-Catchment Management Agency
Lonmin	PPC Cement
Madibeng Local Municipality	Prime Africa
Magalies Water	Prop 5 Corporation
Makane Local Municipality	Randwater
Maluti Water	RE-Solve
Mangaung Metropolitan Municipality	Rhodes University (Institute for Water Research)
Rhovan Operations	University of the Free State
Rockwell Diamonds	University of Venda

Rowing SA Royal Bofokeng Platinum Royal Haskin Samancor Chrome Limited SANParks Sasol Save the Vaal Scherman Colloty & Associates Sedibeng Water SeeSaw SEMBCORP Silulumanzi Sephaka Cement Sibanye Gold Sidebelo Platinum Mines Softchem Source Point South African Logal Government Association South African National Biodiversity Institute South African Sugar Association SRK Consulting Stellenbosch Municipality Stellenbosch University Stellvine Strategic Water Partners Network Swartland Municipality T Squared Corporate Solutions **Tlokwe Local Municipality Tlou Consulting ToxSolutions** Trans Caledon Tunnel Authority Transnet Tshegofents Facilities and Engineering **Tsogang Local Municipality Tswane Local Municipality** TTM Water Quality Engineering Umfula Wempilo Consulting Umgeni water board Umzinyathi District Municipality University of Cape Town University of Fort Hare

- University of Johannesburg
- University of KwaZulu-Natal
- University of Pretoria

University of Witwatersrand Usapho Consulting Vaal Catchment Management Agency Vele Colliery Vhembe Water User Associations Vin Pro Vunene Mining Water Institute of South Africa Water Research Commission Western Cape Department of Agriculture Western Cape Department of Environmental Affairs and **Development Planning** Western Cape Government White River Valley Conservation Board Wildlands Wildlife and Environment Society of South Africa WineTech World Wildlife Fund

Xylem Water Solutions

EXECUTIVE SUMMARY

For many years there has been a considerable amount of effort placed upon developing our understanding of the science behind Water Quality Management (WQM), and this has been critically important in developing the various instruments that are used to manage water resources on a day-to-day basis. This has then guided the shift from only managing via end-of-pipe standards towards a receiving water quality approach. This has in turn guided the development of the various management instruments that are enabled through the National Water Act,1998 (Act 36 of 1998) (NWA) and which frame the current approach to WQM.

As with the development of the science behind water quality management, there has been an evolutionary development of our understanding of governance. The importance of Integrated Water Resource Management (IWRM) in policy and legislation has emphasised the importance of governance as a central theme without which implementation may not be effectively realised. Equally important has been the recent recognition that IWRM does need to underpin water resource development in order to strategically support the economy and social development. Noting the importance of sustainability, IWRM is complex in nature and requires a more multi-disciplinary approach.

As a key subset of IWRM, Integrated Water Quality Management (IWQM) does require an integrated management approach with that of water quantity (surface and ground water) and should not be treated as being separate dimensions of IWRM. The legal and policy imperatives that give effect to IWRM, this requires of us that we engage with institutions (governmental and public entities etc.) towards cooperative governance and with a range of stakeholders and interested and affected partners that provide a supportive base for more collective initiatives.

Over the years the Department has played multiple roles and the national water policy specifically introduced a range of institutional arrangements to shift the Department away from a mode of centralised control towards decentralised management. This enables the Department to move away from a more operational focus towards that of sector leader that provides the policy and oversight.

The National Water Resource Strategy (Edition 2) outlines the approach towards the establishment of 9 Catchment Management Agencies (CMAs) and to see the DWS transform into a Department that develops policy and regulates performance. Whilst there is a way to go in this process a number of key steps have been achieved to date and the establishment of the remaining CMAs is being progressed.

The challenges of water quality management do not only fall with the water sector alone and key socio-economic development sectors also have role to play. The IWQM Strategy outlines key actions to be taken to support this.

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LIST OF ACRONYMS

Abbreviation	Meaning
СМА	Catchment Management Agency
CMS	Catchment Management Strategy
DWA	Department of Water Affairs
DWAF	Department of Water Affairs and Forestry
DWS	Department of Water and Sanitation
GTT	Government Task Team
IRR	Institutional Reforms and Realignment
IWQM	Integrated Water Quality Management
IWRM	Integrated Water Resource Management
LIMCOM	Limpopo Commission
NWA	National Water Act, 1998 (Act 36 of 1998)
NWRS	National Water Resource Strategy
ORASECOM	Orange-Senqu Commission
PICC	Presidential Infrastructure Coordinating Commission
RQO	Resource Quality Objective
RWU	Regional Water Utilities
SANBI	South African National Biodiversity Institute
SIP	Strategic Integrated Projects
SWPN	Strategic Water Partners Network
UEIP	uMngeni Ecological Infrastructure Partnership
WARMS	Water Authorisation and Regulation Management System
WMA	Water Management Area
WQM	Water Quality Management
WRM	Water Resource Management
WSA	Water Services Act, 1997 (Act No. 108 of 1997)
WUA	Water User Association

1. INTRODUCTION

1.1 Background

All too often when undertaking studies that involve highly technical dimensions of water resource management (WRM) the focus tends to fall to those central technical aspects. For many years there has been a considerable amount of effort placed upon developing our understanding of the science behind water quality management, and this has been critically important in creating the frameworks for how we should think about the governance of the resource. This then guided the shift from only managing via end-of-pipe standards towards a receiving water quality approach, for example. This has in turn guided the development of the various management instruments that are enabled through the National Water Act,1998 (Act 36 of 1998) (NWA) and are required to support Integrated Water Resource Management (IWRM). which in turn has started to influence and shape the various institutional roles and responsibilities. Hence, the realisation of the importance in functional and organisational splits between those responsible for policy development, operations, authorisation and compliance monitoring and enforcement.

Organisational structure, therefore, becomes a vehicle through which managers can plan, organise, direct and control the activities in the organisation. However, it is important to note that organisations do not exist in isolation, but do need to interact with an external environment. In this regard, Daft (2007) notes that 'an organisation cannot exist without interacting with customers, suppliers, competitors, and other elements of the external environment'

As a result, a more holistic picture of the entire governance framework is starting to emerge. This is not to say that we have all the answers and that there is no room for improvement. In fact, it is the opposite that holds true and is a critically important part of the adaptive management regime that South Africa utilises. Hence, we need to implement in order to try, test and learn, and by so doing to improve what we do in future.

As with the development of the science behind water quality management, there has been a period of development with regards to the concepts of governance. The importance of IWRM in policy and legislation has surfaced the importance of governance as a central theme without which implementation may not be effectively realised. Equally important has been a strengthening in our understanding that WRM and development needs to strategically consider how water supports social and economic development, whilst ensuring that this is done sustainably. This requires a more multi-disciplinary approach and is complex in nature.

1.2 Context for the Report

As a water scarce country, with considerable variability in both the quantity and quality of resources there is significant pressure to manage water resources in a sustainable manner. The vagaries of climate change together with the important need to develop our economy places added emphasis on our governance regime.

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Since, the promulgation of the NWA there has been a slow, but progressive shift in the governance arrangements. This shift has largely been focused around the establishment of Catchment Management Agencies (CMAs) and Water User Associations (WUAs). Importantly, as these institutions are established, there has been a progressive transfer of relevant powers and duties over time and with developed capacity.

As emphasised earlier, much has been learned during the various institutional processes and this has required some changes in approach as time has progressed. Whilst, there has been frustration at the time taken to make institutional and governance adjustments, initiatives that have such a sector-wide governance impact normally take time and several iterations before stabilising. This means that such institutional processes are inherently fuzzy, and somewhat messy during certain stages, but this is normal and can ultimately result in better outcomes due to the richness of the discovery period. The stages of uncertainty can have impacts upon staff, and staff morale, as well create some confusion as to roles and responsibilities. Hence, during these intensive institutional restructuring periods there can be accusations of institutions not performing adequately, or even failing to perform.

A key consideration, during the discussion on roles and responsibilities is the growing recognition that the Department of Water and Sanitation (DWS) and its various public entities cannot undertake all that is required to ensure that we manage resources sustainably. Institutional separation of regulatory and implementation functions is required constitutionally for water services (between spheres of government) and is implied by the NWA (between DWS and WMIs – particularly CMAs), with DWS as the regulator and other institutions as the implementers. For those implementation functions that may be performed by DWS (such as infrastructure development and operation), this separation may be achieved at a Branch level. The creation of the Policy and Regulation Branch and a Regional Operations Branch will facilitate this.

However, WRM has both a water environmental management function and a water use authorisation function. The Committee for Environmental Coordination has indicated that where environmental management and authorisation of development is performed by the same department, these should be separated managerially. This implies that DWS's water environmental management functions (namely the Reserve determination and classification system) must be located in a separate unit from the other WRM functions.

1.3 Purpose of the Report

This part of the Literature Review feeds into the broader Component 2 of the project that provides an assessment of the current situation and provides insights that guides the development of the policy, strategy and implementation plan. In particular, whilst this report provides inputs into some of the policy considerations (to ensure policy is pragmatic), it most importantly provides input into the strategy and implementation plan as vehicles towards delivery of the policy.

1.4 Outline of the Report

This report briefly looks at the various governance challenges that exist within the WRM context and then looks at the institutional arrangements that underpin this governance regime. The report outlines some of the key institutional challenges and opportunities that exist noting that there is still some state of flux with regard to DWS and its various public entities.

2. PERSPECTIVES ON GOVERNANCE

The interpretation of what constitutes governance is still evolving internationally and continues to be a topic of discussion. This is due in part to the fact that circumstances vary considerably as well as the fact that societal norms and standards also vary and influences how we interpret what we mean by the term.

Since the 1990s, with emergence of IWRM, many institutions and organisations have developed their own definitions of governance. When examining these definitions, one sees how differing dimensions are distilled out. So, for example, some definitions focus upon the exercise of power and authority, whilst others focus on processes and decision-making. Others focus upon the rules or laws and institutions, whilst other definitions indicate the understanding that governance and management should be interchangeable. It is also interesting to note that some definitions describe what governance should be, rather than defining what it actually is. **Table 1** provides an overview of the definitions.

The fact of the matter is that there has been much attention given to this because of its relative importance.

Definition	Organisation
Governance refers to the <i>institutional arrangements</i> which shape actors' <i>decisions and behaviour</i> , including the exercise of authority within groups or organizations (such as firms or nations).	Adaptive governance
Governance is the exercise of <i>political, economic and administrative authority</i> in the management of a country's affairs at all levels. It comprises <i>mechanisms, processes, and institutions</i> through which citizens and groups articulate their interests, exercise their legal rights, meet their obligations, and mediate their differences.	United Nations Development Programme (UNDP)
Governance means the process of decision-making and the process by which decisions are implemented , or not implemented.	UNESCAP
Governance means <i>rules, processes and behavior</i> that affect the way in which powers are exercised at the European level, particularly regarding openness, participation, accountability, effectiveness and coherence.	Commission of the European Communities
Governance consists of the <i>traditions and institutions</i> by which authority in a country is exercised. This includes the process by which governments are selected, monitored and replaced; the capacity of the government to effectively formulate and implement sound policies; and the respect of citizens and the state for the institutions that govern economic and social interactions among them.	The World Bank
Governance is about the <i>institutional environment</i> in which citizens interact among themselves and with government agencies/officials.	Asian Development Bank (ADB)
Governance encompasses the <i>values, rules, institutions, and processes</i> through which people and organizations attempt to work towards common objectives, make decisions, generate authority and legitimacy, and exercise power.	Canadian International Development Agency (CIDA)
Governance is the process whereby societies or organizations make important decisions, determine whom they involve and how they render account.	Institute on Governance
Governance is the process or method by which society is governed.	International Institute for Environment and Development (IIED)
Governance is the process through which governments, sometimes but not always in association with the private sector and civil society, perform their functions.	WRC (L Jonker)

Table 1: Definition of governance by organisation

From the above table, a number of key themes emerge. These include institutions, processes, rules, behaviour, and values that inform decision-making. These key themes can be understood as part of a governance framework comprised of issues of authority, systems decision-making and supported by a number of important enablers.

These are reflected in Figure 1, below.



Figure 1: Key dimensions of a governance framework

The various elements of this framework are essential and any disjuncture ultimately impacts upon the efficacy of our governance system.

It is important to not confuse governance with government. In thinking about the governance framework for water quality management it is in not only government's responsibility to give effect to this governance framework, private business and civil society all have a key role to play.

To this end the concept of cooperative governance becomes equally important. The South African Constitution requires that all spheres of government and organs of state work cooperatively in the national interest. Due to the complexity of water governance this typically requires the engagement of national, provincial and local government, noting that they have differing inputs into the water sector.

The challenges that have been experienced in terms of fostering cooperative governance have been many and require redress if we are to manage water resources sustainably. These challenges include:

- capacity and requisite skill sets;
- limited financial resources;
- vague institutional mandates; and
- ineffective regulatory authority to ensure actions are taken.

This is also exacerbated by the fact that the key elements of good governance are not the same from context to context and do evolve with time.

2.1 Governance as a 'Wicked' Problem

Governance becomes critical where it is unclear where responsibilities lie and where traditionally no one sphere of government, agency, institution, or group of individuals has sole jurisdictional responsibility, such that problem solving capacity is widely dispersed and few actors or decision-makers can accomplish their mission alone. In a pluralistic society, therefore, natural resource management policy problems are what Rittel and Webber (1973) refer to as 'wicked'; namely, problems that 'defy efforts to delineate their boundaries and to identify their causes, and thus expose their problematic nature'. The nature of 'wicked' problems is tabulated below.

Inherent properties	Involves	Requires coordination and cooperation across the horizontal and vertical dimensions of policy and institutional systems and structures including:
cannot be definitively described	large and multifunctional spatial areas	horizontally across administrative boundaries
are persistent, complex, non-linear and irreversible and involve long time scales	substantial institutional and organisational fragmentation	horizontally between agencies and departments within the same level of government when management components of a single natural system are fragmented between them;
socially constructed and often disputed	require enduring and resourced collective responses across interdependent public, private and community sectors	horizontally between government and non- government stakeholders who affect, or are affected by, natural resource management; and
no optimal solutions or solutions with definitive and objective answers.	poor understanding of roles and responsibilities and mandates	vertically when responsibility for management of the processes of an ecological or spatial natural unit rests with different levels of government and/or private actors.
levy enormous costs and have broad consequences (social, economic, environmental)	no centralised system to channel funds for action and mitigation	vertical and horizontal accountability between users and regulatory bodies.

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Table 2: Nature of wicked problems

It is important to consider in more detail some core principles for governance of natural resources. In the post-apartheid South African context, the principles of participation, legitimacy, fairness and equity are particularly important from a transformation perspective, while transparency, accountability, coherency, responsiveness, integration, predictability, direction and performance are important from the perspective of creating well-functioning institutions and processes (systems) for governance of resources. The table below (Table 3) elaborates on each of the principles.

Principle	Elements of the Principle
Participation	All citizens, both men and women, should have a voice – directly or through intermediate organizations representing their interests – throughout processes of policy and decision-making. Broad participation hinges upon national and local governments following an inclusive approach.
Transparency	Information should flow freely within a society. The various processes and decisions should be transparent and open for scrutiny by the public. Processes, institutions and information are clear and directly accessible.
Equity	All groups in society, both men and women, should have opportunities to improve their well-being.
Accountability	Governments, the private sector and civil society organizations should be accountable to the public or the interests they are representing.
Coherency	The increasing complexity of natural resource issues, appropriate policies and actions must be considered so that they become coherent, consistent and easily understood.
Responsiveness	Institutions and processes should serve all stakeholders and respond efficiently to changes in demand and preferences, or other new circumstances. Needs of all stakeholders are considered.
Integrative	Natural resources governance should enhance and promote integrated and holistic approaches.
Ethical considerations	Natural Resources governance must be based on the ethical principles of the society in which it functions, for example, by respecting traditional water/land rights and preventing corruption.
Predictability	There should be predictability of the political and administrative governance system, in that all role players know the rules and accept that these will be applied consistently.
Legitimacy	 Integrity and commitment: Rigorous, fair and thorough. Authority and representivity: There should be a democratically mandated authority. Legitimacy: The authority operates within its mandate.

Table 3: Key principles to enable governance

Principle	Elements of the Principle
Direction	Strategic vision: Broad and long-term perspectives on good governance.
Performance	Effectiveness and efficiency: Needs are met while making best use of
	resources.
	Capacities: All stakeholders have capacities to engage in governance.
	Financial sustainability: Processes are cognisant of resources available.
	Subsidiarity: Power and decisions rest at the lowest appropriate level.
	Resilience: The governance regime is flexible and adaptive.
Fairness	Equity: Costs and benefits are considered and equitably shared.
	Rule of law: Legal frameworks are fair and enforced impartially. Human Rights
	and cultural practices are respected
	Do no harm: Local livelihoods are not adversely affected.
	Effective and appropriate conflict resolution: There is recourse to impartial
	judgment in the case of conflict.
	Access to justice: Legal assistance is available to all stakeholders.

Noting the difficulty, of dealing with such complex 'wicked' problems it is clear that new approaches need to support the development of governance frameworks that encourage and support adaptation as our social and natural systems inevitably continue to evolve and change. The need to bring decision-making processes closer to users has resonance when one considers this complex array of principles.

2.2 Towards Decentralised Governance

The complexity of managing water quality will increasingly require adaptive approaches as the pressures upon the resource mount. In reflecting upon how governance frameworks could or should adjust, it is useful to reflect upon the changes in governance frameworks that have taken place to date.

Up to the 1970's governance regimes were dominated by hierarchical, "top-down" governance models that were largely supportive of large commercial agriculture and industrialised development. Although, with respect to the management of water resources, there were progressive developments in our understanding of hydrology, this period was known as being the golden age of dam construction. Governance approaches were strongly focused on command and control approaches based around the issuing of permits or licenses. As noted by Holling and Meffe (1996) such command and control approaches assume that we can manage against well-defined limits that are understood and linear in nature. However, as Holling and Meffe (1996) and Tollefson, Zito and Gale (2012) rightly note, our world and our natural resources are indeed complex, non-linear and often poorly understood and so the outcomes are often problematic on a socio-economic or environmental scale.

In the 1990's there was realisation that changes were needed in our governance models to address the deepening environmental problems and, in some instances, natural resource crashes. To give effect to the principles of IWRM, there were numerous policy and legislative revisions to support more integrated approaches, and which most significantly resulted in adjusted governance models towards decentralisation (Anderson and Ostrum, 2008).

The South African National Water Policy (Department of Water Affairs and Forestry (DWAF), 1997) and the NWA are aimed at giving effect to IWRM. This calls for the establishment of decentralised water management institutions (CMAs and WUAs), for a range of planning instruments that are focused upon joint and integrated planning, for sustainable development of the resource, for a range of approaches to support and give effect to societal redress, and uses public participation as a cornerstone to all processes. However, the implementation of this policy and law has been slow and challenging. Anderson and Ostrum (2008) provide a range of case studies that equally reflect mixed outcomes from the drive to decentralise.

It has been argued, earlier in this report, that the challenges faced with the existing governance model in South Africa are that there is limited accountability, that regulatory frameworks are ineffective and that there is still insufficient engagement with society (civil and corporate) in the governance of water resources. These find resonance with the findings of other studies such as Neef (2009), Lankford and Hepworth (2010), Pahl-Wostl, Lebel, Knieper and Nikitina (2012) and Tollefson *et al.*, (2012).

Lebel, Anderies, Campbell, Folke, Hatfield-Dodds, Hughes and Wilson (2006) interestingly note that often the challenge with decentralisation is that whilst local institutions are accountable to a central authority (and so provide information up), the accountability back down to the local institutions is not reciprocated causing a governance disjuncture. The resultant lack of information at local levels is problematic. In terms of regulation, Anderson and Ostrum (2008) indicate that often not enough control is handed over to local institutions and users to enable improved resource management. It is also noted that often stakeholder engagement does not move into the realm of inclusive decision making, with stakeholders often just being informed.

The drive towards more a decentralised model has taken place slowly, but studies have shown that such institutional processes do indeed require the time and iterative adjustments (Blomquist, Dinar and Kemper, 2005). The renewed process to establish CMAs and the ring-fencing of Proto-CMA staff, within each of the Provincial Offices has been a significant step forward. Most significantly, the realisation within the water sector of the value that can be added from stewardship styled partnerships will define the governance model for the near future. These partnerships recognise that collective action can bring about a shared ownership of the various water risks and can have significant impact upon the governance of specific problems. The success of the Strategic Water Partners Network has been a case in point.
Interestingly, these partnerships do allow stakeholders to more fluidly enter and exit the governance regime as needed. This helps to prevent governance spaces from becoming too cluttered, and to have focused attention when and where needed, in a more adaptive manner. These approaches start to shift the way we view governance from being monocentric more towards polycentric approaches.

Polycentricism is a social system of many decision centres having limited and autonomous prerogatives and operating under an overarching set of rules (Aligica and Tarko, 2012).

The overriding feature that makes polycentric models attractive to managing natural resources in an uncertain future is that they have the ability to self-correct and adapt (Pahl-Wostl, 2009; Aligica and Tarko, 2012). If we note that ultimately no perfect governance system exists (Anderson and Ostrum, 2008) and as such they <u>attempt</u> to address the need to collectively tackle complex resource challenges, then the ability to act swiftly from lessons learned becomes imperative. With the uncertainties of climate change, economic and social stability, as well as political unrest linked to service delivery, it becomes absolutely essential to have a governance model that is adaptive in a way that typical hierarchical centralised government cannot be. Of course, much of this is related to the degree of formality and the importance of state actors within the governance system (see **Figure 2**).



Figure 2: The importance of formal/informal institutions and state/non-state actors within various governance models (Pahl-Wostl, 2009)

This starts to indicate the importance of partnerships and less formalised structures such as catchment forums, that can adapt timeously to the issues at hand. The exchange of information becomes critical to ensuring the success of such polycentric systems. This information exchange enables shared learning, which is not only a key part of the day to day functioning of the system, due to its complexity, but equally is invaluable in providing the ready knowledge to be able to adapt to changing circumstances

3. INSTITUTIONAL ARRANGEMENTS FOR WQM IN SA

3.1 Introduction

The complexities of managing water resources are multiple and require a well-articulated and effectively implemented institutional framework. The NWA is founded upon the principles of IWRM which requires that we manage our resources sustainably (to support current and future needs), equitably (to support redress and upliftment) and optimally (to maximise the benefit that is obtained). This requires a range of institutions and organisations to develop the policy frameworks and the strategic intent, to operationalise implementation plans, as well as to monitor and oversee via a range of administrative and regulatory systems.

Since the promulgation of the NWA, there have been a number of iterative processes to address both the institutional frameworks, as articulated in the policy and legislation, and organisational aspects to improve the way in which processes and procedures are supported and driven. Hence, we have experienced efforts to affect the institutional frameworks through the establishment of CMAs and an Institutional Reforms and Realignment (IRR)

programme that suggested shifts in the overall framework to better serve the needs of the country. Whilst, organisationally we have experienced changes in the structure of the Department to affect improvements in the way that strategy is driven through structures and systems.

It is important to note that the restructuring mantra that "form follows function follows strategy" is indeed valid, and that whilst the strategy with regards to water resource management remains in some form of flux this will continue to create uncertainties at both institutional and organisational levels. To date the National Water Policy for South Africa (DWAF, 1997) largely remains relevant with some adjustments made during the policy review process of 2013. From a water quality management perspective, the revisions in policy do have some impacts upon how we may consider institutional and organisational aspects, although as has been realised through the last 15 years, the real impact of adjustments in policy and strategy may only be realised with time and iterative testing of approaches.

From an institutional perspective, this is not unusual. Blomquist, Dinar and Kemper (2005) note that in order to embed basin scale institutional arrangements that there is indeed a need to utilise some form of trial and error in order to find the most appropriate institutional solutions. This certainly applies to organisational aspects too, as it takes time for management actions to be realised as observable effects, from which we can make further improvements (Blomquist *et al.*, 2005). For those who have worked in, or with, civil service, it is well understood that with new policy and legislation begins a time-consuming process of trying to determine how best to give effect to these instruments.

Rightly, and in support of this institutional reality, the NWA allows for a phased and progressive establishment of water management institutions, particularly CMAs and WUAs.

It should be expected, therefore, that this phased and progressive institutional development process will result in periodic shifts and adjustments to functional responsibilities of the DWS, and hence, resulting in shifts in the structure.

In order to understand institutional and organisational aspects we firstly need to look at the broad function.

3.2 Integrated water quality management

As a key subset of IWRM, Integrated Water Quality Management (IWQM) requires a connectivity with the management of water quantity and with broader aspects of ecosystem health. With the legal and policy imperatives to give effect to IWRM, this requires of us that we engage with institutions (governmental and public entities etc.) towards cooperative governance and with a range stakeholders and interested and affected partners that provide a supportive base for more collective initiatives.

Whilst there are aspects of IWQM that require more collaborative and cooperatives approaches that potentially reap rewards from collective action, there is also the need for more regulatory approaches some of which is more "command and control" in nature. This is, therefore, institutionally complex and requires of us to fully understand the various roles and responsibilities of institutions and stakeholders across the scope of IWQM noting that these shift across the phases of IWQM.

3.2.1 Phases of IWQM

The 2006 DWA project, entitle "Resource Directed Management of Water Quality" provides a useful description of the phases that management of the resource require, (**Figure 3**). These phases are as follows.

- *Plan:* resource objectives and catchment strategies (including plans) are developed, based on catchment assessment and visioning processes.
- **Do / Implement:** effect is given to the strategies through source directed controls and related instruments, according to a clear decision-making hierarchy.
- **Check:** water resources are monitored and the effects of the strategies (i.e. success or failure) are assessed.
- **Act:** objectives, strategies and decisions are reviewed and adapted according to the needs and conditions within the Water Management Area (WMA).

Planning takes place over a range of scales from national though to local and need to take into consideration the following issues:

- Interconnectivity with other associated planning instruments,
- The various challenges that exist due to misalignment between WMA and provincial and municipal boundaries,
- Differences in planning cycles and objectives, and

 Differences in the types of information that is required in undertaking assessment studies.

The visioning process is critical across the range of planning instruments and does require some alignment when one considers plans across differing scales. This in itself requires institutional interactions to develop this alignment. The determination of the resource class, the Reserve and the Resource Quality Objectives (RQOs) are foundational to the planning process and provide, together with the vision, direction in terms of our management intent. This intent is developed with an understanding of the possible future scenarios that may occur and which enables us to not plan with a "blindfold" over our eyes. These are all captured in differing planning instruments, depending on the scale at which we are planning. Fundamentally important, is the development of the Catchment Management Strategy (CMS) which is developed by each CMA. There is a legal requirement for alignment between each CMS and the National Water Resource Strategy (NWRS).



Figure 3: Four phased integrated water quality management process (DWA, 2006). Abbreviations: WQ = Water Quality, WQM = Water Quality Management, RQOs = Resource Quality Objectives, RWQOs = Resource Water Quality Objectives, SMOs = Source Management Objectives, (WQ) CMS = WQM Component of the Catchment Management Strategy, SDCs = Source Directed Controls)

National and catchment water quality strategies and plans (NWRS, CMS, Integrated Water Quality Management Strategies and potentially sub-catchment and specific thematic plans – for eutrophication, salinity, or emerging pollutants) are given effect through the implementation (or "Do") phase of the cycle. Water use authorisations are informed by a hierarchy, that is informed by the precautionary principle and that aims to prevent certain

pollution, to minimise impacts of other pollutants and accepts that we can allow a certain level of water use. These are in effect Source Directed Controls aimed at various types of water uses that could affect instream water quality and is supported by a range of management instruments, including regulatory instruments (such as the need to apply for and obtain a water use licence) to self-regulation (e.g. Iso 14001 accreditation), market-based (e.g. Waste Discharge Charge System) and civil society based management (e.g. adopt-a-River)

The check process requires a range of monitoring dimensions from the actual monitoring of the efficacy of our planning instruments through to the monitoring of the resource itself and compliance monitoring to ascertain adherence to license conditions.

The final part of the process is to "Act" upon the findings of the monitoring process and to make adjustments in approach towards corrective actions.

This is an adaptive management cycle and does require differing institutional actors to play roles at each stage of the process. Without clarity as to roles and responsibilities, this process can become disjointed, if not drawn out and lengthy. This ultimately has implications on socio-economic development as well as environmental protection, and the need to find a balance between them. At the same time, we are also starting to understand that by being more adaptive in terms of enabling key partnerships (through forums or through Public Private Partnerships) we can enable a more innovative and adaptive management approach.

3.3 Institutional arrangements for Integrated Water Quality Management

In reflecting upon institutional arrangements, it is important to distinguish between the roles of "custodianship" as laid out in the national water policy (DWAF, 1997) and the need to develop policy and regulation to support national objectives, from the role of implementing policy and regulation and putting in place the various systems and procedures to support this implementation.

Over the years the Department has played multiple roles and the national water policy specifically introduced a range of institutional arrangements to shift the Department away from a mode of centralised control towards decentralised management. This enables the Department to move away from a more operational focus towards that of sector leader that provides the rules of the game and oversees how the game is played.

Of course, the challenge has always been that this is not like switching lights on and off, but rather requires this phased and progressive approach as we shift some functions away from the DWS to CMAs, and which then requires movement of staff and the requisite systems to support CMA functioning.

3.3.1 Department of Water and Sanitation

The roles and responsibilities of DWS will increasingly focus upon policy and regulation as the CMAs are established. As the sector leader, it is important for DWS to focus on sector coordination as well as an overarching oversight role in terms of the various public entities that account to the Minister.

The operating structure of the Department (Figure 4) reflects these core functional areas as:

- policy, legislation and strategy;
- information;
- planning;
- regulation; and
- external institutions.

The National Water Resources Infrastructure function is a ring-fenced function supporting resource development.



Figure 4: The operating structure of the Department of Water and Sanitation

These functions have been translated into an organisational structure. The Department undertook a significant restructuring process in 2003/4 in order to improve its ability to implement the NWA. Since then there have been adjustments as we continue to "do-check-act". This adaptive management approach is useful in terms of enabling continuous improvement, but that does come at the price of some uncertainty that can be disruptive to staff.

What is important to note is that there are a considerable range of functions that are spread across the Branch structures that do impact upon the WQM function. These include the following functions.

- Strategy coordination: promotes the coherent development of WRM policies and strategies.
- Integrated water planning: ensures national water availability (including of adequate quality) through integrated planning.
- Water ecosystems management: develops and implements measures to protect the environment and includes both Resource Directed Measures and Source Directed Controls.
- Water use authorisation: enables and coordinates the authorisation of water use across the country.
- Water monitoring and information: develops, coordinates and maintains national water monitoring and information systems.
- **Compliance monitoring**: ensures compliance to water authorisations across all sectors.
- **Enforcement**: compels those that transgress to comply with legislation.
- **Institutional oversight**: ensures an enabling environment for the establishment, governance and oversight of local, regional and national institutions.

The Branch: Provincial Management is responsible for the Provincial Offices and coordination and support functions that provides a bridge between the various Head Offline line functions and the Provincial Offices. Core functional areas for the WQM function are as provided below.

- Water use administration: coordinates water use licensing in all provincial offices.
- **Provincial Offices**: ensures that the implementation of policy, strategies, regulations and programmes by DWS and other institutions.
- **Monitoring and Evaluation**: manages the monitoring and evaluation reporting from the provinces.
- Proto-CMAs: ring-fenced unit that will act as the CMA until the CMA is fully established

Noting the integrated nature of the WQM function, engagement across the Branch structures is imperative to ensure alignment in approach and coordination in function. In this regard, there is a long history of engagement and liaison between line functions and especially between Head Office (in Pretoria) and the various Provincial Offices. These Provincial Liaison meetings have been very important in translating policy and strategy into practice within catchments, and enabling some conformity in approaches. Conversely, these meetings have provided a communications conduit for the Provincial Offices to raise matters that require redress (in policy, strategy, practice, systems etc).

There has been useful discourse and exchange between line functions at Head Office (together with Provincial representation) in order to strengthen elements of the broader WRM function, and which then, has benefit to WQM. For example, programmatic drives such as "Project Letsema" to eradicate water use licence application backlogs and strengthen licensing, have improved the WQM function by default. Ongoing engagements in the development of the Water Management System have also supported WQM, for example. However, there has not been a focused coordinating committee that would bring together all the various line functions that support WQM to develop a structured strategic course of action. To support a more strategic and integrated approach to WQM, a national coordinating committee would be pragmatic.

The recent establishment of the Water Quality Management Forum has been a useful step towards reinvigorating the levels of liaison and coordination that has historically taken place. The success of this forum will depend upon the active participation of the various line functions, the Provincial Offices and the CMAs. This forum also, at this stage, does not have any delegated authority and therefore will rely on the commitment of its members to ensure the deliberations realise practical results.

3.3.2 Restructuring and Decentralising to CMAs

The establishment of CMAs has taken far longer than originally surmised. This is to some extent because the complexities of undertaking such an institutional restructuring process for a national Department were underestimated. This is indeed complex and has implications in terms of financial aspects, in terms of operational aspects and continuity in this regard, as well as implications for staff. The process has therefore been iterative to allow for correction and adjustment as well as phased to enable progressive and constructive development.

At this stage, the Provincial Offices have established ring-fenced Proto-CMAs which will act as the CMA prior to establishment and which will transfer into the CMA to provide the new institution with an immediate and experienced capacity base.

Line functions at Head Office are currently performing their functions as they normally would, however, once the CMA is established and the CMA begins its progressive development, there will be a phased delegation of powers and duties over time and as they develop capacity.

From a water sector perspective, previous restructuring processes within the DWS (such as DWAF, 2001) have identified core principles to:

- Align restructuring processes: There are multiple processes occurring across the sector and it is critical for management to combine efforts through synergised strategies to encourage integrated implementation of the Department' mandate. These synergies could be achieved once principles have been developed that coordinate all restructuring processes.
- Developing a common organisational culture and value system: It is critically important to enable smooth organisational and structural changes, particularly with

regard to culture and value systems that exist across the sector, with the aim of enabling a shared cultural and value system consistent with the mission, vision and strategies of the department.

- Ensuring that restructuring depersonalised processes are (or de-institutionalised), enables participation and that the process and communication by all interested parties: Principles are useful to dispel negative perceptions about the process, such that individuals leading the process can be perceived to be changing the organisation for their own benefit (or that of their institution) while disregarding the values and needs of the majority of the parties (staff and other critical stakeholders) concerned. Principles are necessary to help define roles and responsibilities of individuals and institutions identified by stakeholders involved and directly affected by the process of change.
- Enable sharing of restructuring infrastructure and strategies: In considering structure it is essential that individuals, units and institutions work co-operatively and flexibly to ensure that the vision of the policy and strategy is implemented, therefore it is critical to learn from the other processes that have been completed.
- Creating leadership understanding and commitment to ensure success and credibility of the process: Overall commitment to the process at management level will ensure stakeholder buy-in. Principles should enable management to take the lead and drive the process, while communicating and ensuring participation of all stakeholders.

These are insightful when considering some of the requirements for the strengthening of the WQM function.

The principles identified during the restructuring processes in 2001 (see DWAF, 2001) are still useful and provide valuable insights when thinking about structure towards implementation of the WQM policy and integrated strategy. These principles are provided below.

- Facilitate a needs-based and integrated departmental vision: In considering structure, there should be a focus on meeting the needs of internal and external stakeholders and drive the process of developing strategic goals and implementation plans to meet both sectoral and stakeholder expectations. Therefore, a clear vision should form the basis for all strategic organisational processes, moreover it is critical for top management to ensure that all stakeholders buy-in to the shared vision.
- Separate regulatory and implementation functions: To avoid historic challenges
 of being both player and referee, there is a need to consider the separation of
 regulatory/policy functions and operational/implementation functions. Institutional
 separation of the regulatory and implementation functions is required constitutionally
 for water services (between differing spheres of government) and is implied by the
 NWA (between DWS and WMIs particularly CMAs), with DWS as the regulator and
 other institutions as the implementers. For those implementation functions that may

be performed by DWS (such as infrastructure development and operation), this separation may be achieved at a Branch level, with these Branches holding each other to account.

However, WRM has both a water environmental management function and a water use authorisation function. The Committee for Environmental Coordination has indicated that where environmental management and authorisation of development is performed by the same department, these should be separated managerially. This implies that DWS's water environmental management functions (namely the Reserve determination and classification system) be located in a separate unit from the other WRM functions at Head Office.

- Support Human Resource Development (HRD), transformation and equity: Reflecting upon ways to strengthen structure provides an opportunity for all affected (directly or indirectly) stakeholders to improve the way they do things, to build a culture of understanding, address equity issues, encourage respect and ensure human resource development.
- Retain and maintain critical mass of expertise: Ongoing restructuring processes and institutional changes can have negative impacts upon staff perceptions that may alienate critical expertise across the water sector. DWS needs to develop and maintain core expertise, to perform its ongoing functions, as well as to audit and support other institutions. Therefore, strategies need to be employed that ensure that critical expertise is retained. It can be expected that there will be shifts as new institutions are established, but it will be essential for the sector to retain staff whilst building and strengthening capacity. It will be important to retain institutional knowledge across various sector institutions.
- Support Provincial Office transition processes: The DWS Provincial Offices have ring-fenced the Proto-CMAs and will be faced with the complexities of having to transition to CMAs whilst providing ongoing water resource management functions. The staff that will remain at the DWS Provincial Offices will also be required to transition roles and responsibilities. There are also inconsistencies that do exist between the Provincial Offices that will therefore require differing levels of support. Support systems to enable the Provincial Offices to cope with resource and time constraints will be required.
- Deliver WRM functions efficiently and effectively: As much as the needs of internal (DWS) stakeholders are critical, structuring the WQM function needs to consider a broader suite of external stakeholders and how they can support improved management of water resources. The main driver is the effective and efficient implementation of the National Water Act, as well as the National Water Resource Strategy, the new IWQM Policy and Strategy. Institutional and organisational structuring to support these instruments and the associated implementation plan will be imperative to ensure effectiveness and efficiency.

- Financially sustainable: Budgetary prioritisation and innovative financing should be enabled to sustainably support the WQM function, and should enable ongoing capacity development to ensure sustainable implementation of the implementation plan.
- Business process driven: Decision making processes and delegation of functions to Provincial Offices and other water sector institutions need to be planned to enhance communication and support business transactions and interrelationships between institutions.
- Facilitate change management: The need to make potential shifts in the structuring of the WQM function implies change, which often generates uncertainty and can cause resistance to the process itself. It will be critical for managers of the process of structural or functional changes to build into their plans a strategy that will address change management issues. Some change management actions could include:
 - o greater participation and consultation,
 - o stakeholder management and communication, and
 - o capacity building where needed to support functional or systemic changes.
- Flexible and adaptable: DWS WRM functions will be in transition for at least fifteen years, until CMAs are established and fully functional and the requirements of the NWA are fully implemented. DWS WS functions will also be in transition (probably for a shorter period of time), until all WS schemes and implementation functions have been transferred to local government. All possible implications of this transition cannot be foreseen or addressed at this stage, so the organisational design must be flexible enough to enable DWS as an organisation to adapt to new challenges. The key message is to develop a sound organisational design platform that may evolve over the next decade, noting that WQM does need to be adaptive in its approach the organisational structure needs to be dynamic, robust and achievable to make it easier for DWS and other stakeholders to adapt to changes as a result of the changes in WQM needs.
- Be robust and achievable: During institutional transitional, DWS functions and associated staff will be progressively (and unevenly) transferred to other institutions. This has particular impact upon the Provincial Offices, but not exclusively. This requires the structure and systems to be robust, to enable components to be transferred without jeopardising the operation of the remaining functions and components. An implication of this principle is that functions that are to be transferred should be grouped together (e.g. on a WMA basis for CMA functions), as should the ongoing functions. It also implies that all functions that will eventually be transferred, but are currently performed by the Head Office, should be transferred to the Provincial Office within the next few years.

These goals and transition plans must also be achievable for South Africa over the few years, in terms of the required capacity, resources, technologies, organisational systems and

institutional development. Overly ambitious plans will threaten the efficacy of WQM in South Africa.

3.3.3 CMAs

Chapter 7 of the NWA makes provision for the progressive establishment of CMAs and states the purpose of establishing a CMA is to assign or delegate water resource management to the regional or catchment level and to involve local communities in the decision-making processes.

Broadly, the initial role of a CMA is articulated in the Act as:- i) managing water resources in a WMA, ii) co-ordinating the functions of other institutions involved in water related matters and iii) involving local communities in water resource management. Further functions are then to be assigned or delegated to the CMA as it evolves.

The first stage following the establishment of the CMA is about creating **legitimacy** within the WMA, during which relationships are developed between the CMA, other water management institutions (WMIs) and stakeholders in the WMA. The CMA undertakes the critical role of advising on, and coordinating water resource management, and developing the CMS. This stage is about building relationships, and establishing credibility and legitimacy within the WMA. The CMA assumes initial functions, as defined in Section 80 of the NWA:

- to investigate and advise interested persons on the protection, use, development, conservation, management and control of the water resources in its water management area;
- to develop a CMS;
- to co-ordinate the related activities of water users and of the water management institutions within its water management area;
- to promote the co-ordination of its implementation with the implementation of any applicable development plan established in terms of the Water Services Act, 1997 (Act No. 108 of 1997) (WSA); and
- to promote community participation in the protection, use, development, conservation, management and control of the water resources in its water management area.

To perform these functions, the CMA has some inherent powers under the NWA:

- the powers of a natural person of full capacity (Section 79(1));
- a range of powers related to planning and conducting the routine administrative and organisational business of the CMA (Schedule 4); and
- powers to make and recover charges in terms of the Minister's pricing strategy for water use charges to cover their costs in executing (at least) the initial functions (Section 84(1)).

Following the legitimisation of the CMA, a phase of **consolidation** is entered into during which the CMA is focused on building capacity and strengthening the organisation to

undertake its water resource management functions. This implies strengthening of systems within the organisation, including fiduciary management and governance of the CMA, and the establishment of stable information and implementation systems. Additional water use management functions are delegated to the CMA. Proto-CMA staff, possibly seconded to the CMA during the legitimisation phase, are now transferred to the CMA as a coherent business unit, with the requisite infrastructure and budget. The CMA (led by the Governing Board and CEO) should compile its comprehensive business plan. This must also link to the DWS timeframes for establishing water use charges (under the Pricing Strategy).

The final phase during the evolution of the CMA is the delegation or assignment of **responsible authority functions** as contemplated in sections 73 and 63 of the NWA. With this phase the CMA will perform the majority of water resource management and implementation roles and responsibilities, in assuming the role of Responsible Authority. As a result, the relationship between the CMA and DWS needs to be well established, and the systems and processes within and between these institutions should be stable. Under Section 73(1)(a) of the NWA, the Minister can assign the powers and duties of a responsible authority to a CMA. The most significant of these are the powers and duties related to authorisation of water use and the issuing, review and amendment of licences. In Section 63 of the NWA, there is provision for the delegation of powers and duties vested in the Minister, rather than assignment. However, the Minister is prohibited from delegating certain powers under Section 63(2). In addition to providing the legal basis to the CMA performing its functions in its WMA, the NWA also allows the CMA to perform functions outside its WMA, under the condition that this does not impinge on the execution of its functions or detrimentally affect other water management institutions.

3.3.4 Functional evolution of the CMA

The functions that the CMA will perform fall into three categories and are informed by the NWA, as described below:

- initial functions as described under the NWA (S80);
- inherent functions conferred on a CMA under the NWA; and
- other functions that may be delegated or assigned to the CMA by the Minister.

Some functions, such as water resources planning and monitoring, will be split between DWS and the CMA, and clarity is needed on which elements will be performed by DWS and which by CMAs to prevent gaps and overlaps.

There are some functions on which the Minister has discretion with regard to delegation, and there are certain functions which the NWA prohibits the Minister from delegating. For example, the Minister may not delegate the power to make regulations, authorise a water management institution (WMI) to expropriate land, appoint a member of the Water Tribunal or the governing board of a CMA.

The policy position underpinning this functional analysis is that CMAs will, in due course, perform most of water resources management functions, and that DWS will only retain those

strategic and national level functions. Thus, in determining whether a function should be delegated to a CMA, the following issues should be considered.

- The spatial scale at which the function must be performed, in particular national or regional multi-WMA functions should not be delegated, while WMA or local functions should be.
- The significance of the potential impact of the function.
- The capacity to perform the function, which would include a plan to build that capacity for the delegation, rather than the need to demonstrate existing capacity.
- The principle that a water management institution cannot regulate or audit itself.

Based on these principles, the various water resources management functions may or may not be delegated and performed by a fully functional CMA.

Develop Policy & Strategy

The formulation of policy and legislation will remain a DWS function, to which a CMA would provide input. At the strategy level, a CMA is responsible for the development of a CMS, as well as financial and business planning for the organisation.

DWS will continue to:

- develop legislation, methodology and guidelines to enable WRM;
- develop the national water resources strategy, the pricing strategy; and institutional roles and responsibilities; and
- determine the water resources class, as well as the Reserve and RQOs in resources of national significance
- long-term strategic planning and visioning for the WRM function,
- develop legislation and regulations, ensuring coherence and integration,
- planning for the reconciliation of water availability and requirements,
- formulating the organisational roles and responsibilities of water institutions,

In some cases, DWS may delegate the determination of the Reserve and resource quality objectives (RQOs) to the CMA for those resources that are not considered to be of national significance.

Regulate Water Use

This functional area aims to affect the policies, strategies, frameworks, plans and regulations for managing the use of water resources, including quantity, quality and instream activity. A fully functional CMA will perform most of the responsible authority functions in relation to authorising and enforcing water use, and setting and collecting water use charges. However, DWS will retain authorisation and allocation of water for strategic purposes, inter-WMA transfers and where the CMA is the proposed water user.

The CMA will now be responsible for water use registration, validation and verification. DWS will, however, maintain the national Water Authorisation and Regulation Management System (WARMS) database and CMAs will have to provide the information to DWS for this.

Establish, Support and Regulate Institutions

DWS will remain responsible for the establishment, support and regulation of CMAs, WUAs that manage government waterworks or have government guaranteed loans, and any national level bodies such as the Trans Caledon Tunnel Authority and the Water Research Commission. DWS will also be responsible for inter-WMA coordination and conflict resolution.

A CMA may establish, regulate and support water management institutions that have been specified in its CMS, such as WUAs, as long as these do not manage government water schemes or have government guaranteed loans. The CMA is obliged to coordinate water related activities of institutions and ensure community participation in WRM within the WMA.

Monitoring and planning

DWS will remain responsible for the development of the national information monitoring system, and for monitoring of water resources at those points defined as part of a national monitoring system. This is necessary to maintain national level monitoring and assessment of the state of water resources. The actual monitoring may be outsourced or delegated to a CMA.

Each CMA will be responsible for any additional monitoring of water resources that is necessary for the implementation of the CMS in their water management area and for assessment and evaluation based on this monitoring.

DWS will remain responsible for national water resources planning, including the determination of allocable water per water management area. The CMA will plan for the allocation and management of water within the allocable water determined by DWS. The CMA may prepare reconciliation scenarios for its area of jurisdiction, but will need to co-ordinate this carefully with DWS to avoid duplication.

The CMA will be responsible for the water resource rehabilitation, emergency interventions and disaster management. The latter entails being responsible for issuing flood warnings within the WMA, with DWS issuing flood warnings with inter-WMA impacts or implications. Similarly, drought rules will be determined and implemented by the CMA.

In considering the functional dimensions, a generic organisational structure for a CMA is as reflected in **Figure 5** below.

It is important to note the split between the planning functions from the more regulatory functions under water resource management.



Figure 5: Generic CMA structure

3.3.5 Water Boards and Regional Water Utilities

Water Boards core business is the sale of bulk water to municipalities. Interestingly from a water quality perspective, the primary activities do include a mandate to treat wastewater, but only Umgeni Water owns and operates a wastewater treatment works.

Water boards may (and do) carry out secondary activities. The WSA does stipulate that these secondary activities may not jeopardise a water board's primary function. Water boards may undertake secondary activities in terms of contracts with municipalities both inside and outside their designated service areas. Similarly, they could enter into contractual arrangements with CMAs to support in terms of water resource management activities.

To date some of the Water Boards have provided support through undertaking monitoring of catchments as well as through the active engagement in the catchment management forums. These activities have been valuable to the sector in that they have provided additional capacity where the existing capacity (at DWS Provincial Offices) had been stretched.

The IRR programme noted the disparities between Water Boards and recognised that there is a need to provide institutional support to those are less well capacitated. Some Water Boards service areas that have a weak revenue base that really prevents the institution from expanding and improving its levels of service. Therefore, the IRR programme noted four primary drivers for change:

 The weak performance in the management of water supply and sanitation services by many municipalities compromises the extension of services to those without services, and results in (or threatens to result in) unreliable and unsafe services.

- There are some gaps in the existing institutional and financial framework related to responsibilities for water resources development at the local and regional level, and for regional bulk services outside of the existing water board service areas.
- There is merit to an approach which creates greater alignment and integration between water resources and water services infrastructure through the vertical integration of systems.
- There have been (and currently exist) governance and performance-related problems for some of the existing water boards.

As a result, the IRR programme has put forward the concept of Regional Water Utilities (RWU) and this has been reflected in the recent National Water Policy Review.

- The primary activity of RWU will be to manage regional infrastructure including financing, project development and on-going operations and maintenance. RWU can also engage in secondary and tertiary activities. Legislation will need to be changed to state that such regional infrastructure will not be a local government responsibility and will fall under the responsibility of the Minister of Water and Environmental Affairs.
- Secondary activities are defined as development and management of local infrastructure that would, under normal circumstances, be the responsibility of water services authorities, in the case of potable water, and WUAs, in the case of nonpotable water.
- **Tertiary activities** are defined as:
 - Structured interventions to build capacity in low capacity municipalities, with management contracts being one means of achieving this. This intervention is motivated firstly by the developmental objective of getting water to poor households in rural areas and, secondly, by the fact that bulk water supply arrangements cannot be successful if sound retail arrangements are not in place.
 - Ad hoc interventions in support of water services authorities, building on what is happening currently, where RWUs support municipalities with a range of services such as operation and maintenance contracts for parts of infrastructure systems, scientific services, advice etc.
 - Services to CMAs to assist them with sampling, testing, meter reading, billing and so forth.
 - Services to support DWS.

These will be done based on payment for services (cost recovery) and competitive bidding.

3.3.6 Transboundary Water Resource Management

Some 60% of South Africa catchment area falls within international basins. As a signatory to the Revised Protocol on Shared Watercourses in the SADC, South Africa supports the objectives of the protocol to:

- promote and facilitate the establishment of shared watercourse agreements and Shared Watercourse Institutions for the management of shared watercourses;
- advance the sustainable, equitable and reasonable utilisation of the shared watercourses;
- promote a co-ordinated and integrated environmentally sound development and management of shared watercourses;
- promote the harmonisation and monitoring of legislation and policies for planning, development, conservation, protection of shared watercourses, and allocation of the resources thereof; and
- promote research and technology development, information exchange, capacity building, and the application of appropriate technologies in shared watercourses management.

South Africa then interfaces with international partners in a variety of bilateral and multilateral arrangements to engage on a variety of water resource management and water resource development matters (**Table 4**).

Institution	Responsibility
Joint Water Commission (JWC)	Provides a technical forum for Swaziland and South Africa to discuss and advise the two Governments regarding resource allocations, resource development and infrastructure constructions, operations and maintenance, and the prevention and control of pollution.
Joint Water Commission (JWC)	Provides a technical forum to advise the two Governments of Moçambique and South Africa on technical matters relating to the development and utilisation of water resources of common interest.
Joint Water Commission (JWC)	Provides a technical forum to advise the Governments of Moçambique and Swaziland on technical matters relating to the development and utilisation of water resources of common interest, especially the Umbeluzi
Tripartite Permanent Technical Committee (TPTC)	Provide a technical advisory role with the function to make recommendations to the three Governments of Moçambique, South Africa and Swaziland regarding various water management issues.
Komati River Basin Authority (KOBWA)	Implement Phase 1 of the Komati River Basin Development Project. Phase 1 comprises the design, construction, operation and maintenance of the Driekoppies Dam in South Africa (Phase 1a) and the Maguga Dam in Swaziland (Phase 1b).
Inkomati System Operation Task Group (ISOTG)	The Tripartite Technical Committee (TPTC) set up the Inkomati System Operation Task Group (ISOTG) to recommend operating rules for the Incomati River Basin with the Komati River basin as priority

Table 4:	Bilateral	and Multi-la	ateral In	stitutional	Arrangements	in	the	Inco-N	laputo	Basin

Whilst there is no established Commission in the Inco-Maputo basin, the Orange-Senqu and the Limpopo basins have both established Commissions (ORASECOM and LIMCOM) supported by a Secretariat, led by an Executive Secretary. Whilst, the Commissions have representation from the various member states and do provide the decision making within the basin, it does need to be understood that ultimately the Commission can only be advisory in nature to the various member states, each of which have sovereign authority. As a result, ORASECOM and LIMCOM provide a platform for that technical advice to the parties and therefore facilitate a range of programmes that enhances basin management through shared discourse and exchange of information.

The functions of the Council laid out in the ORASECOM Agreement (signed in 2000) are informative as to the technical advisory areas for which the Commission has responsibility:

- Measures and arrangements to determine the long-term safe yield of the water sources in the River System;
- The equitable and reasonable utilisation of the water sources in the River System to support sustainable development in the territory of each Party;
- The investigations and studies conducted separately or jointly by the Parties, with regard to the development of the River System, including any project or the construction, operation and maintenance of any water works;
- The extent to which the inhabitants in the territory of each Party concerned shall participate in respect of the [planning, development, utilisation, protection and conservation of the River System, as well as the harmonisation of policies in that regard and the possible impact on the social, cultural, economic and natural environment;
- The standardised form of collecting, processing, and disseminating data or information with regard to all aspects of the River System;
- The prevention of pollution of water resources and the control over aquatic weeds in the River System;
- Contingency plans and measures for responding to emergency situations or harmful conditions resulting from natural causes such as droughts and floods, or from human conduct such as industrial accidents;
- The regular exchange of information and consultation on the possible effects of planned measures;
- Measures with a view to aiming at a settlement of a dispute between two or more of the Parties; and
- Such other matters as may be determined by the Parties.

These functions indicate that the intention for the Commission is to play a strong role in setting a framework for the management of the basin as a whole.

3.3.7 Broader Government

The IWQM Policy and Strategy have noted the importance of a broader inter-sectoral and government-wide approach towards strengthening the management of water quality. This is indeed complex and recognises the need for Government to act in concert and be supportive of national and provincial policy. This does require of Government Departments a far more holistic understanding of mandates and a more engaged discourse with regards to policy, planning, operations and regulation. National policy and strategy do need to be developed by the lead sector Department with the participation of other Departments, spheres of Government and broader society.

Whilst, other Government Departments and spheres of Government may support other sector policies and strategies, there are challenges in this in that there are often not the appropriate line functions, the appropriate instruments or the skills sets to sufficiently or appropriately engage. Reflection upon the various sectors does indicate that many sectors have an impact on water quality and yet are also impacted upon by poor water quality (**Table 4**). Historically, management of water quality has been the mandate of the DWS alone, but the importance of this to so many sectors elevates the need for Government across sectors and spheres to strengthen structures, systems and skills in order to support IWQM. *This means that a concerted effort by all spheres of government, across all of the 22 departments listed below, and between all 9 provinces, 8 metropolitan municipalities 44 district municipalities and 205 local municipalities is required.*

Sectors						
Agriculture, forestry and fisheries	Social Development					
Communications and Information Services	Statistics					
Cooperative Government and Traditional Authorities	Tourism					
Economic Development	Trade and Industry					
Education	Treasury					
Energy	Water and Sanitation					
Environment	Public Works					
Health	Rural Development and Land Affairs					
Human Settlements	Science and Technology					
Mineral Resources	Presidency					
Planning, Monitoring and Evaluation	Public Enterprises					

Table 5:	Sectors	that need	to	engage	in	water	quality	management
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There is complexity in taking on an inter-sectoral, government-wide approach in that these sectors cut across national, provincial and local Government in various ways due to:

- Some competencies being of national responsibility whilst others are of national, provincial and/ or local responsibility;
- National and Provincial Government largely has the mandate to develop policy and strategy and oversee implementation;

- Local Government largely has a service delivery and economic development mandate;
- Differences in core mandate with regards to natural resources; and
- Administrative boundaries do not coincide with natural, hydrological boundaries.

The use of government clusters is aimed at improving government planning, decision making and service delivery through the coordination of programmes at both national and provincial levels. The Ministerial clusters, which provide for overarching policy and strategic alignment, are technically supported by the clusters of the Forum of South African Directors-General. These clusters need to be utilised to ensure alignment and coordination across Government. The clusters that engage with water related matters are:

- Economic Sectors, Employment, Infrastructure Development Cluster; and
- Social Protection, Community and Human Development Cluster.

In addition, the use of various committees, commissions and task teams enable more formalised and programmatic approaches. Examples include:

- Presidential Infrastructure Coordinating Commission (PICC): Aimed at supporting the development infrastructure across the country, together with the various benefits that are derived from infrastructure development. The responsibilities for infrastructure development reside with national departments, stateowned companies, provinces, municipalities and regulatory bodies, resulting in the risk of disjointed or contradictory planning and prioritisation or uncoordinated implementation. The PICC aims to ensure a more strategic and co-ordinated response to these challenges. The Infrastructure Development Act (Act 23 of 2014) provides the legal basis for the establishment of the PICC and the National Infrastructure Plan as key instruments to co-ordinate and drive infrastructure development. From a water quality management perspective, the linkage to the Strategic Integrated Projects (SIP) is important, with the SIP 18 project focusing upon water and sanitation infrastructure.
- Government Task Team (GTT) for Mine Closure and Water Management: This GTT was established by Directors-General of DEA, DMR, DST, and DWS and also includes the membership of the Council for Geoscience and the National Nuclear Regulator. Other secondary members may be invited and include local and provincial government as well as relevant parastatals such as the WRC. The aim of the GTT is to facilitate integrated and coordinated solutions and decision-making on mine water management, mining environmental challenges and other related mining impacts, as well as the implementation of safe and sustainable mine closure options. Therefore, the GTT will act as an advisory committee, to make policy suggestions and to clarify existing legislation, and to make official recommendations to the Directors-General of the Departments responsible for the formation of policy required in terms of legislation. The GTT advises on the issuing of directives, orders, suspensions and instructions in terms of applicable and appropriate legislation. The GTT will also

advise regarding media intervention where necessary. The GTT has established working groups to support its functioning. These are geographically based and are focused upon the Inkomati and Olifants basins, as well as the North West and the Free State.

Certainly, a case can be made for other such Task Teams to address key water quality management challenges and should be structured with regards to address specific issues. As such, a Task Team to address the poor performance of wastewater treatment works, within Municipalities, is probably the most important and could potentially realise very significant improvements in the water quality status of many river and wetland systems. The challenges of local government are well documented and often can be distilled to financial and technical capacity. Nonetheless, the municipal environment has a significant impact upon the water quality, as well as broader environmental matters. It is, therefore, of some importance that not only is local government engaged in the development of the water quality management policy and strategies, but that they become part of the solution in addressing these issues.

3.3.8 Private Sector and Civil Society

There has been an increasing recognition of the important role that the private sector and civil society have to play in supporting IWRM. This is in fact a cornerstone of the concept of IWRM and is reflected as such in the NWRS.

Whilst there have been some difficulties in the discourse between the private sector and Government, work such as the United Nations CEO Water Mandate (Pegram, Orr and Williams, 2009) has brought to the fore the realisation that there is indeed a shared risk with regards to water. As such, this provides a valuable basis for constructive discourse and conjunctive action.

Civil society continues to play an invaluable role in acting as a watchdog over the various dimensions of water resource management. Particular NGOs and Civil Society groups have played an important role in strengthening water quality management by improving awareness and building capacity, by acting as a mediator or liaison with marginalised groups, in advocating for improved and innovative approaches in management, and by raising the flag on various issues where action or implementation has failed, or is, failing.

Two examples of vehicles for this engagement exist and provide useful guidance for future engagement by the private sector and civil society:

Public private partnerships

These arrangements provide the platform for the private sector to introduce technology and innovation, whilst the public sector can use its mandate to push for operational efficiencies and the delivery of implementation projects that have broader societal benefit and shares risks. There are significant gains to be had from exchange of knowledge and skills. The **Strategic Water Partners Network** (SWPN) was established in 2011 by the Minister of DWS with the aim to bring public, private and civil society partners together to address

supply-demand deficit that South Africa will face by 2030. To this end the SWPN has identified priority areas that have major impact future water supply and demand, that have potential for scalable action and provide opportunity for the development of public-private partnerships. These areas for attention are:

- *Effluent and Waste Water Treatment* including mine water management and municipal waste water management and reuse;
- *Water Use Efficiency and Leakage Reduction* with a specific focus on municipal and industrial water loss; and
- Agricultural Supply Chain Water towards unlocking funding and improve equity in water access for irrigation schemes and improving water use efficiency in irrigation.

The SWPN has successfully established a common vision of water as a risk to social, economic and environmental sustainability and, with its partners, has developed a shared understanding of issues that need to be addressed. This has laid the basis for trust amongst the partners which is needed to instil action. As a result, the Effluent and Waste Water Treatment working group has led the establishment of a Mine Water Coordinating Body, supported by the mines in the Upper Olifants River in order to address the mine water management challenges that have significant impacts on the Olifants River.

The **uMngeni Ecological Infrastructure Partnership** (UEIP) was launched in November 2013, via a Memorandum of Understanding that included public, private and civil society sector stakeholders. The South African National Biodiversity Institute (SANBI), are the driving force behind the initiative and have deployed a coordinator with the specific task of ensuring that the UEIP works towards ensuring that ecological infrastructure in the uMngeni catchment is restored and sustainably managed in order to enhance its capacity to contribute to the delivery of water and sanitation services in the catchment (Jewitt, Zunckel, Dini, Hughes, de Winnaar, Mander, Hay, Pringle, McCosh, and Bredin, 2015). The following that were identified as being benefits that would accrued from restored and well managed ecological infrastructure in the uMngeni Catchment (SANBI, 2013):

- Improved water quality;
- Flood attenuation;
- Increased winter baseflow; and
- Reduced sediment loads in both the river channel and impoundments.

Catchment Management Forums

Forums have had a relatively long history in terms of engagement in water issues in South Africa and have played an important role in supporting IWRM and advocating for improved processes. Whilst there are a number of challenges that face the establishment and day-to-day functioning of these cooperative platforms, they are still understood by the DWS to be important structures towards ensuring effective implementation of policy and strategy. The NWA indeed says very little about forums and how they should function, hence, detailed guidelines for catchment management forums (DWAF, 2001) paved the way for a deeper understanding of not only the roles and responsibilities that can be given to forums, but

importantly articulated how they actually should function. Without such guidance these platforms could be open to abuse or misuse when in effect they are aimed as being cooperative platforms that should be transparent, engaging, outcomes focused and supportive of equity.

The way in which stakeholder engagement is perceived has matured with experience, as well as through initiatives such as the UN CEO Water Mandate and the concept of Collective Action (CEO Water Mandate, 2013) that notes how forums can play a range of roles (**Table** 6).

Level	Description
Informative	Focuses on coordinating the sharing of information in the interest of expanding knowledge and increasing transparency, familiarity and trust among interested parties.
Consultative	Focuses on convening specific interested parties to exchange ideas and expertise and to create a shared understanding of needs, interests and challenges in order to enable informed, independent decision making by all parties.
Collaborative	Seeks to move interested parties closer together and reflects a belief that finding common ground, establishing common objectives and sharing implementation responsibilities hold the potential to increase both individual and collective effectiveness.
Integrative	Emerges when an alignment of interests, resources, decision making, and coordinated actions is desired or needed to meet water-related challenges or opportunities. Interested parties are typically formally convened or have a formal joint structure.

Table 6: Nature of Collective Action (CEO Water Mandate, 2013)

In effect forums can [play three key roles, and in some instances, play a number of these roles simultaneously:

- o Informative: Acting as a hub of information, providing a vehicle for dissemination;
- Advisory: Providing inputs and comments on issues at hand; and
- *Operational:* Being more engaged in operational matters, debating courses of action, providing technical inputs, acting as a watchdog.

The roles and responsibilities of forums, and DWS and CMAs in supporting them, can adjust with time and vary from project to project. These shifts can be linked to the spectrum of public participation and the nature of engagement. Forums are likely to be most effective with projects and functions that require multi-lateral inputs and broad stakeholder participation. This has implications for the various organisational options and ultimately can influence the institutional form required. So, the nature of engagement shifts across the three core roles of being *informative*, *advisory* and *operational* (**Table 7**).

Recent indications, reflect that there are between 70 and 100 functional forums across the country. However, due to the challenges that are being faced by the broader water sector, the DWS and the forums themselves, these numbers do vary with time and the criticality of issues at hand. As a result, the Catchment Management Forum Revitalisation Project was initiated in early 2014 and is ongoing.

Table 7: Spectrum of Public Participation (adapted from International Association of Public Participation)

Increasing Level of Public Engagement $ ightarrow$									
INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER					
Public participation goal									
 To provide the public with balanced information to assist them in understanding the problem, opportunities, solutions and alternatives 	 To obtain public feedback on analysis, alternatives and decisions 	 To work directly with the public throughout the process to ensure that public concerns are consistently understood and considered 	 To partner with the public in each aspect of the decision-making process including the development of alternatives and the identification of preferred solutions 	 To provide decision making ability in the hands of stakeholders 					
Informative	Advisory		Operational						

3.3.9 International support

A number of international support programmes have been initiated since the promulgation of the NWA and the WSA. Most of these provided not only financial support but also provided a conduit for technical support on a range of technical areas associated with the then new policy and legislation. These have varied in size and focus, often based upon the specific interests of the donor/ support agencies.

Whilst, there are a number of differing support initiatives at present some examples of these that have relevance to water quality management include:

- Project Kingfisher: There has been a longer-term relationship with the Netherlands. Under the LOGO-South programme, funded by VNG International (the international cooperation arm of the Netherlands National Association of Municipalities), support was provided to the Inkomati Usuthu and Breede Gouritz CMAs on a range of institutional and technical dimensions of IWRM. This initial support has now been significantly strengthened under Project Kingfisher with support being provided to a wider number of proto-CMAs and with a broader scope of technical support. This still involves a programme of technical exchange that can support the IWQM policy and strategy implementation.
- RESILIM: Funded by USAID, this programme provided support to the Limpopo and Olifants River basins as two separate programmes under the same banner. The support to the Olifants River basin has been coordinated through the Association for Water and Rural Development and has largely focused upon strengthening local WRM activities as well as enhancing the management of biodiversity. As such, this initiative has started to make the important connections between water resource management and ecological infrastructure. This programme whilst is currently in its latter phases may be extended into a broader regional programme under the banner of "Resilient Waters".

4. INSTITUTIONAL IMPLEMENTATION

Whilst we have argued that the CMAs will utilise catchment forums and partnerships with corporate business (and others) to foster a more engaged catchment management regime, there will still be a requirement to engage with the various spheres of government. This is important in that there are a range of activities that fall under the ambit of these government departments that are critical to the management of water quality. These are reflected in **Figure 6**, below.



Figure 6: Key institutional relationships related to water quality management (after DWA, 2006)

The relationships between national, provincial and local government departments are indeed complex with the DWS and CMAs having limited authority and with much resting on the requirement of the Constitution to foster cooperative government. However, when the CMA embarks on key water resource management activities these departments will understand the benefits to themselves in creating alignment. These relationships are largely structured around:

- resource directed measures and the setting of the Class, Reserve and RQOs;
- water resource planning and the development of such instruments as the CMS;
- water use authorisations and the requisite compliance monitoring and enforcement; and

 information management activities that provide the necessary data and information to enable water resource management.

The roles and relationship will transition as the CMAs are established and develop capacity. These four functional focal points will be the responsibility of DWS until such time that the CMA takes up these functions broadly against the following time frames (Annexure 1 provides more detail).

- Year 1-2: Development of the Catchment Management Strategy.
- Year 3-4: Strengthened information management.
- Year 5 onwards: Water use authorisations and some Resource Directed Measures.

The setting of the class is a consultative process and requires inputs from national, provincial and local government, as well as other interested and affected parties such water users and forum representatives. At this stage these processes are being managed by the DWS largely through the Proto-CMAs.

The development of the CMS is a CMA function as part of the initial functions that the CMA takes up on establishment. The NWA stipulates that the strategy must take into consideration any national or regional plans that are relevant as well as any development plan that falls under the ambit of the WSA. In effect this means that the strategy must consider the Integrated Development Plans, the Water Services Development Plan and the Provincial Growth and Development Strategy. With this in mind it will be important to engage national, provincial and local government actors together with water users, forum members, and civil society. The development of the CMS is a fundamental piece of work for the CMA, and the development of its legitimacy.

Although the water use authorisation function is understood as a responsible authority function, and would only be delegated after 5 years, the CMA will start facilitating the licensing process once it has developed its CMS. This will support the CMAs growing competency in the information management arena and so management of systems such as the WARMS will become important during this phase. Even while the DWS is signing off on authorisations, the CMA will play a key role in undertaking the consultation processes that are required. This will require engagement with users as well as other Government actors such Department of Environmental Affairs, Department of Mineral Resources, Provincial Departments of Agriculture and so forth. This will require engagement with their own legislative requirements as laid out in laws such as the Environmental Conservation Act, 1989 (Act 73 of 1989), the Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983) and the National Environmental Management Act, 1998 (Act 107 of 1998). This will require cooperation with other key enforcement units, as well as the compliance monitoring and enforcement units in DWS. This will also require the establishment of some alignment in the issuing of directives with other management and control mechanisms in the water management area. Close cooperation with other national and provincial Departments will be important.

Monitoring takes place at various levels and the actors vary accordingly. In terms of institutional monitoring perspectives, with a focus on institutional compliance, the DWS will play a key role in monitoring the CMAs, whilst the CMAs have role to monitor the WUAs and forums. The CMAs will need to monitor water users and as such the CMA will engage with local government, WUAs, forums, partnerships and individual users.

In terms of national strategies regarding sustainability development and climate adaptation strategies, the Department of Environment Affairs will be a key actor, that both DWS and the CMA will engage. The DWS has developed a Water Sector Climate Adaptation Strategy that will need to interface with the countries National Adaptation Strategy. Engagement with DEA will be critically important.

4.1 Risks in the Decentralisation Process

Given an understanding of the nature of the initiative and the purpose of establishment of the CMAs, it is useful to articulate some of the key implementation risks. Managing these risks becomes a central function of the CMA and of DWS in its oversight and regulatory role.

4.1.1 Complexity of the project

Many of the water management areas are complex and are already under water stress. Ongoing management of the resource will require balancing the needs of highly vocal and well-resourced sectors with poor, marginalized and water deprived communities. Management will require a high level of technical skills and understanding, as well as social and economic analysis capacity, and the ability to drive transformation in the water sector in the catchment with a particular focus on redress and meeting the needs of poor communities. These are technically challenging issues for a new institution and it will take time to develop legitimacy.

4.1.2 Spheres of Government

Both Local and Provincial Government have a key role to play in ensuring effective water management in water management areas. The boundaries of water management areas do not coincide with the political boundaries of provincial and local government, and the CMA will need to expend considerable effort to ensure effective relationships with relevant local authorities and provincial departments, and to ensure a proper understanding of the role, boundaries and purpose of the CMA. Buy-in, coordination and cooperation between the three spheres of government are pre-requisites for achieving optimal water management.

4.1.3 Stakeholder acceptability

The CMA establishment puts forward a new "business model" based on a public entity for water resources management. In addition to government, it is key that this new model is accepted by stakeholders, both current water users and would-be water users across the area of jurisdiction. This takes time and effort, and ultimately budget.

4.1.4 Delegation of powers and functions

The service delivery relates to the rate at which water resources management functions are delegated to the CMA. The risk is that the capacity may not be in place to implement these delegations, and so the transfer and recruitment of staff and building of capacity must be done in a way that aligns with the need to implement delegations.

However, there is a further risk that the delegation of the final functions to the CMA may take too long, particularly the delegation of the power to authorise water use and for billing and revenue collection. An agreement should be put in place between DWS and the CMAs regarding the timeframes and requirements for the final delegation of functions to each CMA.

4.1.5 Financial management

There are a number of dimensions associated with the financial viability risk. The most critical include the inability to collect water use charges as a result of either poor legitimacy of the CMA, inadequate systems and capability on the part of DWS prior to this function being delegated, or the CMA after delegation. The willingness to pay by stakeholders is a critical risk. The issue of affordability is also pertinent, in relation to user groups such as resource poor farmers. Poor revenue collection will mean that the operating costs of the CMA will need to be recovered from a small base of users and as such there is the potential for higher charges that could worsen the cycle of affordability and debt collection.

4.1.6 Climate change and natural disasters

Climate change and disasters such as droughts and floods are significant risks that could impact on the water availability and safety within a water management area. In particular the effect of climate change could lead to changing water use patterns, reduced availability and allocation of the resource, and lower ability-to-pay amongst users as enterprises become marginal. Mitigation of this risk through augmentation is limited and accordingly this risk should be quantified and considered carefully in the strategic planning of the Agency.

4.1.7 Human Resources

The human resources risk is fairly critical and has a major impact on the CMA's ability to undertake its functions effectively. There are a number of sub risks associated with the human resources risk area. These include taking transfer of de-motivated, demoralised staff from DWS, the inability to attract and develop appropriately skilled staff and the inability to retain these staff once they have been developed. A key concern is that the market for appropriately skilled WRM staff will become more competitive as other CMAs are established.

4.1.8 Organisational Technologies

The technology risks relate to the integrity of the data to be handed over by DWS. Data of poor integrity may impact on the CMA's ability to undertake its WRM functions effectively, on

its financial viability and on the credibility of the CMA. Other concerns around organisational technology relate to the adoption of DWS systems, by the CMA, and the suitability or appropriateness of this technology to the CMA, given its smaller scale.

4.1.9 Risk management

It is critical that the CMA builds its relationship with relevant institutions and stakeholder bodies in the water management area. Strong stakeholder relationships, participatory planning and management, and strong governance will go a long way to reducing a number of the risks raised above. Ultimately, the management of risk will be dependent on strong governance arrangements for the CMA. The role of DWS in regulating and overseeing the performance of the CMA will also be important in this regard. DWS has considerable experience in the oversight of 15 Water Boards, the Water Research Commission and the Trans-Caledon Tunnel Authority, and will draw on this experience to ensure effective oversight and regulation of the CMA.

5. CONCLUSIONS

Since the promulgation of the NWA there has been a gradual shift in the institutional frameworks towards the establishment of CMAs. Although the process was far slower than has been mapped out by the Team for the Implementation of the NWA in 2002, which had estimated that all 19 CMAs would be established by 2012, much has been learned and in fact the complexity of this institutional transformation was significantly underestimated.

The NWRS (Edition 2) outlines the approach to see 9 CMAs established and to see the DWS transform to a Department that develops policy and regulates performance. Whilst there is a way to go in this process a number of key steps have been achieved:

- The DWS has restructured to establish a branch focused upon policy and planning, as well as a branch focused upon regulations. Co-ordination between these branches and within the sector has started to improve through various initiatives (although further strengthening of alignment and co-ordination will be essential for improved WQM in South Africa)
- The Department has developed business cases for a number of the CMAs in order to obtain approval from National Treasury and Department of Public Service Administration to establish these public entities and to have them listed in the schedules of the Public Finance Management Act, 1999 (Act 1 of 1999).
- The two functional CMAs have now been delegated responsible authority functions and this is proving a valuable testing ground to assess where the challenges lie. The initial delegations that were provided to the CMAs were not sufficient and it was realised that the CMA could not perform some of its inherent functions without additional delegations. These issues have been resolved and lessons have been learned. Financial challenges exist and improvements in the efficiency of collection of water use charges need to be realised. The Waste Discharge Charge System needs to be implemented. Systems challenges are being addressed and were historically focused upon access to the WARMS system. Newer systems are now being designed with the CMAs in mind. Capacity and skills remain a challenge as the structure and focus of the Proto-CMAs is not the same as that of the CMAs.

The improved alignment and co-ordination of WQM activities within the Department and between the department and its institutions, and the establishment of CMAs throughout the country will be a key step towards improving WQM. The challenges of water quality management do not however only fall with the Department of Water and Sanitation and its Institutions and key socio-economic development sectors also have a role to play. The IWQM Strategy outlines key actions to be taken to support this.

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APPENDIX A:

INITIAL, INHERENT OR DELEGATED / ASSIGNED FUNCTIONS OF CMAS

Powers and functions under the National Water Act to be performed by CMAs as initial, inherent or delegated/assigned functions		
SCHEDULE	FUNCTIONS	Time Frame
INITIAL AND	INHERENT FUNCTIONS	
INITIAL FUNC	TIONS	
Chapter 2: Wa	ter Management Strategies	
Part 2:S8	Establishment of Catchment Management Strategy	On Establishment of the CMA
NWA, Chapter 7; S 80 (a)	 Investigate and advise Authorization of water use Receive license applications and advise users (ito CMS) Advise users/institutions on implications of CMS for water use Advise DWA on license applications or WMA authorization issues Advise DWA and users/stakeholders on demand management, compulsory licensing process and on restrictions or directives on water use WR Studies and investigation Conduct and commission studies on water resources Planning Advise UWA on WMA issues in NWRS and national processes Advise UWA on classification of resources (&RQO) Advise DWA on classification of resources (&RQO) Advise DWA on reserve determination Advise DWA on reserve determination Advise DWA on classification of resources (&RQO) Advise DWA on classification so f CMS/RDM Information Provide available WR and other information to stakeholders Requires maintenance of information systems (based on those in DWA) Disaster management Advise DWA and other institutions on the management of floods, droughts and pollution incidents 	On Establishment of the CMA
NWA, Chapter 7; S 80 (b)	 Catchment Management Strategy The CMA is responsible for the development of a CMS. The following will form part of the CMS: 	
	 Conduct, commission, participate in investigations and studies to support management decisions for strategy development Requires maintenance of information systems aligned to DWA Develop management strategies WRM/reconciliation Allocation plans WQ management plans Institutional development Participation and empowerment 	

	 Information management and WMA monitoring Stakeholder consultation strategy Participation structures Formal consultation (nazetting, etc.) 	
NWA	3. Institutional Co-ordination	On Establishment
Chapter 7; S	Coordinate activities of water users according to CMS	of the CMA
80 (c)	 Foster cooperative governance (particularly local government) Coordinate WMI (particularly WUA, Water Boards ito WRM) Institutional development of stakeholders 	
NWA,	4. Coordinate CMS implementation with WSDP implementation	On Establishment
Chapter 7; S 80 (d)	 Coordinate and align CMS and WSDP development Cooperative governance with LG water services, in terms of WS-WRM interaction and WSDP implementation 	of the CMA
NWA,	5. Stakeholder Participation	On Establishment
Chapter 7; S 80 (e)	 Establish and manage structures to enable stakeholder participation 	of the CMA
	 Consult with stakeholders about WRM decisions Promote awareness and empower stakeholders to participate 	
INHERENT	FUNCTIONS OF THE CMA UNDER THE NWA	
S 15.	Giving effect to any determination of a class of a water resources and the resource quality objectives	On Establishment of the CMA
	This is premised on the CMA having the powers to take any action that will impact on the class of a resource	
S 18	A CMA must give effect to the Reserve as determined in terms of this Part when exercising any power or performing any duty in terms of this Act	
	This is premised on the CMA having the powers to take any action that will impact on the class of a reserve	
S 19	Prevention and remedying effects of pollution	On Establishment of the CMA
S20 (4) (d)	The CMA may give verbal or written instructions to a responsible person on measures to be taken regarding an emergency incident. A verbal directive must be confirmed in writing within 14 days.	On Establishment of the CMA
S20 (6) – (9):	The CMA may take remedial action and claim for the costs of that remedial action.	On Establishment of the CMA
S25(3):	Preparation of an annual report containing details of transfers of water entitlements under S25 (1) or (2)	On Establishment of the CMA
S57(2):	Application of pricing strategy: making of charges within a specific water management area and payable directly to the CMA	On Establishment of the CMA
S79:	General powers and duties of CMAs	On Establishment of the CMA
S82(2):	Recommendation by members of the governing board of members to be appointed as chairperson and deputy chairperson	On Establishment of the CMA
S82(5):	Establishment of committees, including an executive committee and consultative bodies	On Establishment of the CMA
S84(1):	Funding of CMAs: A CMA may raise any funds required by it for the purpose	On Establishment

	of exercising any of its powers and carrying out any of its duties in terms of this Act.	of the CMA
S85:	Documents relating to litigation: A CMA must provide to the Director General copes of all pleadings, affidavits and other documents in possession of the CMA relating to any proceedings instituted against the CMA	On Establishment of the CMA
S86	Delegation of powers by CMA	On Establishment of the CMA
S124	Appointment of authorised person	On Establishment of the CMA
S135	Ownership of waterworks on land belonging to another	On Establishment of the CMA
S136:	Transfer of personal servitudes	On Establishment of the CMA
S145(1):	Duty to make information available to the public	
S155:	Interdict or other order by High Court – CMA may apply to the High Court for an interdict against a person who has contravened the Act	On Establishment of the CMA
S159:	Effect of delegation:	On Establishment
	Delegation of a power does not prevent the exercise of that power by the person who made the delegation; delegation may be made subject to conditions;	of the CMA
SCHEDULE 4	OF NWA MANAGEMENT AND PLANNING OF WATER MANAGEMENT INST	TITUTIONS
SCHEDULE 4 Part 1: Gover	OF NWA MANAGEMENT AND PLANNING OF WATER MANAGEMENT INST	TITUTIONS
SCHEDULE 4 Part 1: Gover Schedule 4(1)	OF NWA MANAGEMENT AND PLANNING OF WATER MANAGEMENT INST rning Board Functions and powers of governing board	TITUTIONS On Establishment of the CMA
SCHEDULE 4 Part 1: Gover Schedule 4(1) Schedule 4(3)	OF NWA MANAGEMENT AND PLANNING OF WATER MANAGEMENT INST rning Board Functions and powers of governing board Appointment of CEO by Board	On Establishment of the CMA On Establishment of the CMA
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SCHEDULE 4 Part 1: Gover Schedule 4(1) Schedule 4(3) Schedule 4(3) Schedule 4(9)	OF NWA MANAGEMENT AND PLANNING OF WATER MANAGEMENT INST rning Board Functions and powers of governing board Appointment of CEO by Board Removal of CEO by Board Convening meetings of the Board	TITUTIONS On Establishment of the CMA On Establishment of the CMA On Establishment of the CMA On Establishment of the CMA
SCHEDULE 4 Part 1: Gover Schedule 4(1) Schedule 4(3) Schedule 4(3) Schedule 4(9) Schedule 4(10)	OF NWA MANAGEMENT AND PLANNING OF WATER MANAGEMENT INST ming Board Functions and powers of governing board Appointment of CEO by Board Removal of CEO by Board Convening meetings of the Board Notices of meetings.	On Establishment of the CMA On Establishment of the CMA On Establishment of the CMA On Establishment of the CMA On Establishment of the CMA
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SCHEDULE 4 Part 1: Gover Schedule 4(1) Schedule 4(3) Schedule 4(3) Schedule 4(3) Schedule 4(10) Schedule 4(15) Schedule 4(16) Schedule 4(17)	OF NWA MANAGEMENT AND PLANNING OF WATER MANAGEMENT INST rning Board Functions and powers of governing board Appointment of CEO by Board Removal of CEO by Board Convening meetings of the Board Notices of meetings. Minutes of Board meetings Participation in meetings Resolutions without meeting	TITUTIONS On Establishment of the CMA On Establishment of the CMA
SCHEDULE 4 Part 1: Gover Schedule 4(1) Schedule 4(3) Schedule 4(3) Schedule 4(9) Schedule 4(10) Schedule 4(15) Schedule 4(16) Schedule 4(17) Schedule 4(18):	OF NWA MANAGEMENT AND PLANNING OF WATER MANAGEMENT INST rning Board Functions and powers of governing board Appointment of CEO by Board Removal of CEO by Board Convening meetings of the Board Notices of meetings. Minutes of Board meetings Participation in meetings Resolutions without meeting Execution of documents	TITUTIONS On Establishment of the CMA

4(19):		of the CMA
Schedule 4(20):	Power to regulate its own proceedings subject to Part 3 of Schedule 4	On Establishment of the CMA
Part 4: Institu	itional Planning	
Schedule 4(2'	Preparation of business plans by the Board	On Establishment of the CMA
Schedule 4(2	Submission of business plan to Minister	On Establishment of the CMA
Schedule 4(25)(3)	Board to consult with Minister and revise business plan according to changes agreed between it and the Minister	On Establishment of the CMA
Schedule 4(26):	Board to inform Minister of significant events that might prevent or materially affect achievement of the objectives of the institution	On Establishment of the CMA
Part 6: Recor	ds and reporting	
Schedule 4(32):	Board must ensure proper financial records and accountability	On Establishment of the CMA
Schedule 4(33):	Preparation and submission of annual report to Minister and tabling in Parliament	On Establishment of the CMA
Schedule 6: \	Nater Tribunal	
Part 2: Lodgi	ng and hearing of appeals and applications	
Schedule 6(5)(3):	A CMA against whose decision or offer an appeal or application is lodged must within a reasonable time -	On Establishment of the CMA
	(a) send to the Tribunal all documents relating to the matter, together with the reasons for its decision; and	
	(b) allow the appellant or applicant and every party opposing the appeal or application to make copies of the documents and reasons.	
Function of C	MA to be assigned or delegated by Minister	
Chapter 3 Pro	tection of Water resources	
Part 2: Class	fication of water resources and resource quality objectives	
S13	Determination of reserve and resource quality objectives for those resources that do not have a high protection class or are not of national significance	Fully functional CMA within 5 years of establishment
Part 3: The Reserve		
S16	16, In some cases, DWA may delegate the determination of the Reserve in those resources that do not have a high protection class (eg. Class I).	Fully functional CMA within 5 years of establishment
Chapter 4: Use of Water		
S22(3)	Once the CMA has been delegated the responsible authority functions in relation to authorising water use is may use S22(3) to dispense with the requirement for a licence if it is satisfied that the purpose of this Act will be met by the grant of a license, permit or other authorization under any other law. <i>This function does not need to be delegated to a CMA but is automatic along</i>	Fully functional CMA within 5 years of establishment

	with the delegation of the water use authorization function	
S22(3)	Once the CM A is the responsible authority is may choose to combine licence requirements into a single licence requirement with other government departments.	Fully functional CMA within 5 years of establishment
	This function does not need to be delegated to a CMA but is automatic along with the delegation of the water use authorisation function	
S22(4):	a responsible authority may promote arrangements with other organs of state to combine their respective licence requirements into a single licence requirement	Fully functional CMA within 5 years of establishment
	This function does not need to be delegated to a CMA but is automatic along with the delegation of the water use authorisation function	
S22(5):	 A responsible authority may, subject to section 17, authorise the use of water before - (a) a national water resource strategy has been established; (b) a catchment management strategy in respect of the water resource in question has been established; (c) a classification system for water resources has been established; (d) the class and resource quality objectives for the water resource in question have been determined; or (e) the Reserve for the water resource in question has been finally determined. 	Fully functional CMA within 5 years of establishment
	This function does not need to be delegated to a CMA but is automatic along with the delegation of the water use authorisation function	
S24	Licences for use of water found underground on property of another person	Fully functional CMA
S(25):	Transfer of water use authorisations On condition that the transfer takes place within national regulations and within the boundaries of the CMA	After CMS has been developed within 3years of establishment
S30	A responsible authority may, if it is necessary for the protection of the water resource or property, require the applicant to give security in respect of any obligation or potential obligation arising from a licence to be issued under this Act.	Fully functional CMA
	This function does not need to be delegated to a CMA but is automatic along with the delegation of the water use authorisation function	
S35	:Verification of existing water uses	Fully functional
	This function does not need to be delegated to a CMA but is automatic along with the delegation of the water use authorisation function	CMA within 5 years of establishment
Part 4: Stream	flow reduction activities	
S36(2):	The Minister may, by notice in the Gazette, in relation to a particular area specified in that notice, declare any activity (including the cultivation of any particular crop or other vegetation) to be a stream flow reduction activity if that activity is likely to reduce the availability of water in a watercourse to the Reserve, to meet international obligations, or to other water users significantly.	After CMS has been developed within 3years of establishment

Part 5: Contro	lled activities	
S38	Declaration of certain activities as controlled activities Within the boundaries of the WMA only	After CMS has been developed within 3years of establishment
Part 6: Genera	I Authorisations	
S39	: General authorisations to use water Within the WMA boundaries only	After CMS has been developed within 3years of establishment
Part 7: Individ	ual applications for licences	<u> </u>
S40(3):	A responsible authority may charge a reasonable fee for processing a license application which may be waived in deserving cases This function does not need to be delegated to a CMA but is automatic along with the delegation of the water use authorisation function	Fully functional CMA within 5 years of establishment
S40(4):	A responsible authority may decline to consider a licence application for the use of water to which the applicant is already entitled by way of an existing lawful water use or under a general authorisation. This function does not need to be delegated to a CMA but is automatic along with the delegation of the water use authorisation function	Fully functional CMA within 5 years of establishment
S41	S41 Procedure for licence applications: This function does not need to be delegated to a CMA but is automatic along with the delegation of the water use authorisation function	Fully functional CMA within 5 years of establishment
S42:	Reasons for decisions This function does not need to be delegated to a CMA but is automatic along with the delegation of the water use authorisation function	Fully functional CMA within 5 years of establishment
Part 8: Compu	Ilsory licences for water use in respect of specific users	
S43	Compulsory licence applications This function does not need to be delegated to a CMA but is automatic along with the delegation of the water use authorisation function	Fully functional CMA within 5 years of establishment
S44	Late applications This function does not need to be delegated to a CMA but is automatic along with the delegation of the water use authorisation function	Fully functional CMA within 5 years of establishment
S45	Proposed allocation schedules This function does not need to be delegated to a CMA but is automatic along with the delegation of the water use authorisation function	After CMS has been developed within 3years of establishment
S46	Preliminary allocation schedules This function does not need to be delegated to a CMA but is automatic along with the delegation of the water use authorisation function	After CMS has been developed within 3years of establishment
S47	Final allocation schedule	After CMS has been developed

	This function does not need to be delegated to a CMA but is automatic along with the delegation of the water use authorisation function	within 3years of establishment
Part 9: Review and renewal of licences, and amendment and substitution of conditions of licences		
S49	Review and amendment of licences This function does not need to be delegated to a CMA but is automatic along with the delegation of the water use authorisation function	Fully functional CMA within 5 years of establishment
S50	Formal amendment of licences This function does not need to be delegated to a CMA but is automatic along with the delegation of the water use authorisation function	Fully functional CMA within 5 years of establishment
S51(1):	Successors in title This function does not need to be delegated to a CMA but is automatic along with the delegation of the water use authorisation function	Fully functional CMA within 5 years of establishment
S52 (2), (3), (4):	Procedure for earlier renewal or amendment of licences This function does not need to be delegated to a CMA but is automatic along with the delegation of the water use authorisation function	Fully functional CMA within 5 years of establishment
Part 10: Conti	ravention of or failure to comply with authorisations	
S52	Rectification of contraventions This function does not need to be delegated to a CMA but is automatic along with the delegation of the water use authorization function	Fully functional CMA within 5 years of establishment
S54	Suspension or withdrawal of entitlements to use water This function does not need to be delegated to a CMA but is automatic along with the delegation of the water use authorisation function	Fully functional CMA within 5 years of establishment
S55	Surrender of licence This function does not need to be delegated to a CMA but is automatic along with the delegation of the water use authorisation function	Fully functional CMA within 5 years of establishment
Chapter 5: Financial provisions		
S59(3)(b):	Restriction of the supply of water to the water user from a waterwork or the restriction or suspension of the authorisation to use water until charges have been paid For charges made under S57(2)	After CMS has been developed within 3years of establishment
S60(2):	issuing of a certificate stating the amount of unpaid water charges and any interest due For charges made under S57(2)	After CMS has been developed within 3years of establishment
Part 2: Financ	ial assistance	
Chapter 6: General powers and duties of Minister and Director General		
Part 1: Delega	tions, directives, expropriation, condonation and additional powers	
S63(3)	Delegation of a delegated power and function to another person where the delegation by the Minister allows this	After CMS has been developed within 3years of establishment

S64:	Expropriation of property Where authorised by the Minister in writing	Fully functional CMA within 5 years of establishment
S65:	Expropriation for rehabilitation and other remedial work For functions that fall under the CMA	Fully functional CMA within 5 years of establishment
S66:	Condonation of failure to comply with time period For functions falling under the CMA	After CMS has been developed within 3years of establishment
S67:	Dispensing with certain requirements of the Act Where this has been authorised under S67(1)(c)	After CMS has been developed within 3years of establishment
S68:	Intervention in litigation	In the first two years of the CMA's establishment
Part 3: Powers	s relating to catchment management agencies	
Chapter 8: Wa	ter User Associations	
S92	Procedure for establishment of water use associations	In the first two years
	Where the WUA does not have government owned infrastructure or government guaranteed loans	of the CMA's establishment
S95	Directives to water user associations	In the first two years
	Where the WUA does not have government owned infrastructure or government guaranteed loans	establishment
S96	: Disestablishment of water user association	In the first two years
	Where the WUA does not have government owned infrastructure or government guaranteed loans	of the CMA's establishment
S97(1)(b); (4)	Winding up affairs of disestablishment water user association	In the first two years
597	Where the WUA does not have government owned infrastructure or government guaranteed loans	of the CMA's establishment
	Chapter 11: Government Water Works	
S109	Acquisition, construction, alteration, repair, operation and control of government waterworks	After CMS has been developed
	In relation to all government waterworks pertaining to monitoring infrastructure for the CMA requirements only	within 3years of establishment
S110	Consultation and environmental impact assessment	In the first two years
	In relation to government waterworks pertaining to monitoring infrastructure for CMA requirements only	of the CMA's establishment
S111	Financing of government waterworks	After CMS has
	In relation to government waterworks pertaining to monitoring infrastructure for CMA requirements only	been developed within 3years of establishment

S112	Water from government waterworks For all water use other than strategic water use within the WMA	After CMS has been developed within 3years of establishment
S115	Disposal of government waterworks For all government waterworks pertaining to monitoring infrastructure for CMA requirements only	After CMS has been developed within 3years of establishment
Chapter 14: M	onitoring, assessment and information	
Part 2: Nationa	al information systems on water resources	
S141(b)	Provision of information	After CMS has been developed within 3years of establishment
Part 3: Informa	ation on floodlines, floods and droughts	
S145(2)	Establishment of an early warning system In relation to issue pertaining within the WMA only	After CMS has been developed within 3years of establishment
SCHEDULE 3: ASSIGNMENT	POWERS WHICH MAY BE EXERCISED AND DUTIES TO BE PERFORMED OR DELEGATION (SECTIONS 72, 73 AND 151(1)(L))	BY CMAS ON
Schedule 3(2)	 Power to manage, monitor, conserve and protect water resources and to implement catchment management strategies. A catchment management agency may (a) manage and monitor permitted water use within its water management area; (b) conserve and protect the water resources and resource quality within its water management area; (c) subject to the provisions of the Act, develop and operate a waterwork in furtherance of its catchment management strategy; (d) do anything necessary to implement catchment management strategies within its water management area; and (e) by notice to a person taking water, and after having given that person a reasonable opportunity to be heard, limit the taking of water in terms of Schedule 1. 	After CMS has been developed within 3years of establishment
Schedule 3(3):	Catchment management agencies may make rules to regulate water use	After CMS has been developed within 3years of establishment
Schedule 3(4)	CMA may require establishment of management systems	In the first two years of the CMA's establishment
Schedule 3(5):	CMA may require alterations to waterworks	In the first two years of the CMA's establishment
Schedule 3(6):	CMA may temporarily control, limit or prohibit use of water during periods of water shortage	In the first two years of the CMA's establishment

APPENDIX B: LIST OF ACKNOWLEDGEMENTS

The following individuals and organisations are thanked for their contributions to the project:

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Collen Morodi	DWS: Economic and Social Regulation
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ARC ARC Aurecon BGCMA **Bitou Local Municipality** City of Cape Town Consultant DEA DEA&DP (BRIP) DEA&DP (BRIP) DEA&DP (BRIP) DEA&DP (PCM) Department Local Government DWS Institutional Oversight HO DWS RPW Mines **Eco-Owl Consulting** Green Cape Jantech CC La Bri Living Lands See Saw (probably) Stellenbosch Municipality Swartland Municipality Vin Pro Western Cape Department of Agriculture Wildlands Winetech Winetech Xylem

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IWQM National Symposium

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Glencore BHK **Glencore Rhovan Operations** Glencore Western Mine Glencore Western Mines Impala Platinum Land Bank Marico River Conservation Association Marico River Conservation Association Midvaal Water Co **Pilanesberg Platinum Mines** Platmin SA **RB** Plats **Tlokwe City Council** Tlokwe City Council Union Mine Anglo American Union Mine Anglo American

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DWS