



*Department of Water Affairs
& Forestry*

*KwaZulu-Natal
Regional Office*

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**ASSESSMENT OF THE
FINANCIAL FEASIBILITY RELATED TO
THE ESTABLISHMENT OF A
CATCHMENT MANAGEMENT AGENCY
FOR THE USUTHU TO MHLATUZE
WATER MANAGEMENT AREA**

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1. INTRODUCTION

The uSuthu to Mhlatuze Catchment Management Agency (CMA) is to be established for the uSuthu to Mhlatuze Water Management Area (WMA) – Water Management Area No. 6, as defined in Government Notice No. 1160, published in the Gazette on 1 October 1999.

This report is entitled “*Financial Feasibility Related to the Establishment of a Catchment Management Agency for the uSuthu to Mhlatuze Water Management Area*”. The underlying financial feasibility study is dependent upon a wealth of previous research (see bibliography). However the report has been produced as a freestanding document to allow interested parties easy access to the core financial issues involved.

2. NAME

The uSuthu to Mhlatuze Catchment Management Agency (CMA) Proposal Development Working Group proposes the following name for the CMA:

uSuthu to Mhlatuze Catchment Management Agency

3. DESCRIPTION OF SIGNIFICANT WATER RESOURCES & THEIR CURRENT & PROPOSED MANAGEMENT

3.1 INTRODUCTION

The uSuthu to Mhlatuze WMA, which is the area to be served by the proposed uSuthu to Mhlatuze Catchment Management Agency, consists of five large tertiary catchments that are listed below:

- uSuthu
- Pongola
- Mkuze
- Mfolozi
- Mhlatuze

By South African standards, this WMA is exceptionally well endowed with water resources. As a result, although there are isolated instances of water shortages in severe drought periods, generally speaking there is a surplus of water available. This creates significant opportunities for development and for transfers to other WMA's.

The predominant geological formation in the WMA belongs to the Bluff Formation covering 16% of the WMA. It runs in a thick band from the southernmost part of the province up to the northernmost Assegaai catchment border of the WMA. This is closely followed in size by the Vryheid sandstone formation that mottles the

inland areas. Of almost equal cover of 8-10% each are the Pietermaritzburg Shale, Dwyka Tillite, Dolerite and the basement granite and gneiss. The Acid Pongola Rocks Formation, Natal Group Sandstone and Rhyolite cover 3-5% each. Water bodies and Lake St Lucia cover 4.7% of the WMA.

The area is covered with soils of varying agricultural potential; very high potential soils occur on the Makatini Flats and the Pongola River flood plains. High potential soils are confined to the surrounds of Mkuze and Hluhluwe Game Reserves. The remainder of the WMA represents soils of moderate agricultural potential with pockets of low potential soils.

The implication for the drafting of the financial feasibility models is that the WMA cannot depend on natural aquifers for the bulk supply of water. There are no primary aquifers (water bearing geological structures such as faults) in the WMA except for sandy coastal areas which, incidentally, receives a higher amount of rainfall compared to other areas in the WMA.

3.2 NATURAL CHARACTERISTICS OF THE WATER MANAGEMENT AREA

This WMA is particularly richly endowed with ecological features of local, national and international interest and concern. Chief of these is undoubtedly the Greater St. Lucia Wetland Park which has been declared a World Heritage Site, with two parts of it registered as Wetlands of International Significance under the Ramsar Convention. The Park comprises the last remaining subtropical area containing its original diverse components of wild plants and animals on the south-eastern coast of Africa, and one of the last remaining in the world. Within the Park are exceptional wetland, terrestrial and marine ecosystems with accompanying species that include many endemic and internationally recognized threatened species and migratory species. The high species richness of the Park is outstanding, principally due to its regional position at the interface between tropical and subtropical African biota, but also due to past speciation events within the Maputaland Centre of Endemism. Landscapes are also outstanding and the geomorphological processes by which they are formed are believed to be of universal importance (DEAT 1999). Other significant biodiversity features within this WMA include the relatively extensive network of game reserves and state forests representing and preserving important and significant species and landscapes (e.g. the Hluhluwe / Umfolozi Game Reserve Complex and the Black and White Rhino conservation). Much of the uniqueness of these systems is driven (and hence strongly affected) by catchment processes. This implies that the determination of the ecological reserve is of importance in this WMA. Not all water would be available for economic and industrial development and this must be considered in the formulation of a pricing strategy. On the other hand, water pollution arising from agricultural and industrial practices, would need to be managed so that the potential for utilising the natural environment for tourism could be realised.

RAINFALL

Rainfall is strongly seasonal in this WMA with in excess of 80 % of rain occurring as thunderstorms during the period October to March. The peak rainfall months

are December to February in the inland areas and November to March at the coast. Mean annual precipitation (MAP) ranges from in excess of 1200 mm in the west, to 400 mm to 600 mm around the Jozini area, increasing to over 1200 mm at the coast.

RUNOFF

Mean annual runoff (MAR) figures are in excess of 250 mm in the West (20 % of MAP), to less than 50 mm (10 % of MAP) in the central areas, to in excess of 100 mm at the coast (8 % of MAP). The north-eastern coastal areas incorporating Kosi Bay and Lake Sibayi, are endoergic areas, contributing minimal net runoff. The overall MAR is 112 mm (13 % of MAP).

EVAPORATION

In accordance with the rainfall pattern, the relative humidity is higher in summer than in winter, with a daily mean peak for February (ranging from 68 % in the inland areas to greater than 72% for the coast) and a daily mean low in July ranging from 60 % in the inland areas to greater than 68 % at the coast.

Potential mean annual gross evaporation (as measured by 'A' pan) ranges from 1600mm to 1800 mm in the west to 1800 mm to 2000 mm at the coast. The highest mean monthly 'A' pan evaporation is in December (200 mm to 240 mm) and the lowest mean monthly evaporation is in June (80 mm to 110 mm).

3.3 LAND USE

The majority of land is used for agriculture with areas of grassland. The agriculture found in this WMA includes large areas of beef pastures, wheat and maize cropping with sugar cane (irrigated and dry-land) along the coast and up towards Pongola. Cotton and citrus are also grown in the coastal areas up to Pongola, with vegetables, nuts, soya and other crops and dairy pastures being spread from the coast to the inland regions. The majority of irrigation is done using sprinkler irrigation systems, but micro irrigation is also used in the western areas. About 30% of the irrigation water losses occur in the canals below and coastward from Pongolapoort Dam.

Forestry is also an important land use activity in the WMA. There are large amounts of forestry around Richards Bay up to the St. Lucia wetland areas, as well as around Melmoth, Nongoma and the northern areas from Paulpietersburg up to the top of the WMA in the west.

The WMA also supports coal mines in the Vryheid area (Hlobane Collieries), and some mining activities around Piet Retief and at Richards Bay (Richards Bay Minerals).

The Usuthu to Mhlathuze WMA supports large natural park and wetland areas. The entire coastline from St Lucia up to the Mozambique border at Kosi Bay is a wetland sanctuary. Other reserves include Tembe Elephant Park, Umfolozi, Ndumo, Itala and Hluhluwe reserves.

The major dams to be found in this WMA include Pongolapoort, Zaaihoek, Goedetrouw and Klipfontein. There are a number of small dams in this WMA that are largely utilised for irrigation purposes.

Settlement and population density

The population of the WMA is estimated at 2 776 096. According to studies conducted in the WMA (Wilson, 2002;), 80 % of the population resides in rural areas while the balance (20%) resides in urban areas.

The districts with the lowest populations are Ngotshe and Wakkerstroom, both of which have less than 35,000 people. Several rural farming districts in the interior have populations of less than 50,000 including Piet Retief, Paulpietersburg and Utrecht.

The two most heavily populated districts are Lower Umfolozi (241,000), which includes both Richard's Bay and Empangeni, and Eshowe (215,000).

The total population of specific tertiary catchments in the WMA is shown in Table 3.1 below. The catchment with the highest population is the Mfolozi River (V312) with 590,000, followed by the Mhlathuze River with 431,000. Together, the four largest tertiary catchments account for 68% of the total WMA population.

	Total Population*	Population Density <i>people/km²</i>	% Urban Population	% Rural Population
Usuthu to Mhlathuze WMA	2 159 000	39	14%	86%
Specific Catchments:				
Mfolozi	590 000	59	14%	86%
Mhlathuze	431 000	103	26%	74%
Mkuze	129 000	28	1%	99%
Pongola	328 000	28	8%	92%
Remaining Catchments	680 000	27	12%	88%

Table 3.1: Demographic statistics for selected tertiary catchments in the WMA

* Based on 1996 Census Enumerator Areas intersected by tertiary catchments

3.4 WATER TRANSFERS

Within the Usuthu to Mhlathuze WMA, the Mhlathuze River (Usuthu-Mhlathuze WMA) is subject to water transfers from the uThukela WMA. Approximately 58 million m³/a is transferred from the uThukela River to the Mhlathuze sub-catchment. The largest of these schemes is that at Middeldrift operated by the Mhlathuze Water Board and which involves the annual transfer of approximately 31 million m³ from the uThukela River to the

Mhlatuze sub-catchment. Other transfers into the Mkuze sub-catchment add another 31 million m³, to give a total of 88 million m³ transferred in *per annum*.

Sub-catchment	Transfers in	Transfers out
Upper Usuthu	0	114
Pongola	0	30
Mkuze	30	0
Mfolozi	0	18
Mhlatuze	58	0
Total for WMA	88	162

Table 3:2: Summary of Current Transfers

Source: Draft National Water Strategy – August 2003

A new transfer scheme to provide for the requirements of the Fairbreeze mine in the Usuthu to Mhlatuze WMA is mooted. This will involve the future annual transfer of approximately 300 million m³ from the uThukela River to the Mhlatuze Catchment. As a conservatism this has not been included in the financial model.

3.5 WATER USE

Early in 1999, DWAF commissioned a study that was initially known as “The National Water Balance Model”. Subsequently it became known as “The National Water Situation Assessment Model”. Its purpose was to develop a high level overview of the status of water resources for each significant river, and hence each WMA in the country. As such, it would provide an invaluable tool for the use of the fledgling CMA’s. Its focus was on water quantity, as opposed to water quality, and its intention simplistically was to estimate water use and then compare this to water availability. In order to do this it has had to take into account the following aspects, amongst others:

- Urban use
- Forestry
- Irrigation
- Bulk industrial use (not in urban areas)
- “The Social Reserve”
- “The Environmental Reserve”
- Alien plant use of water
- Groundwater usage and potential
- Available water resources

Of the current water usage in the area, by far the biggest is for water transfers to other catchments. The next biggest usage is for irrigation. Other uses are minor by comparison.

An extremely important component in the above analysis is the Environmental Reserve (ER) determination. This gives an estimate of the water requirements to maintain, in a

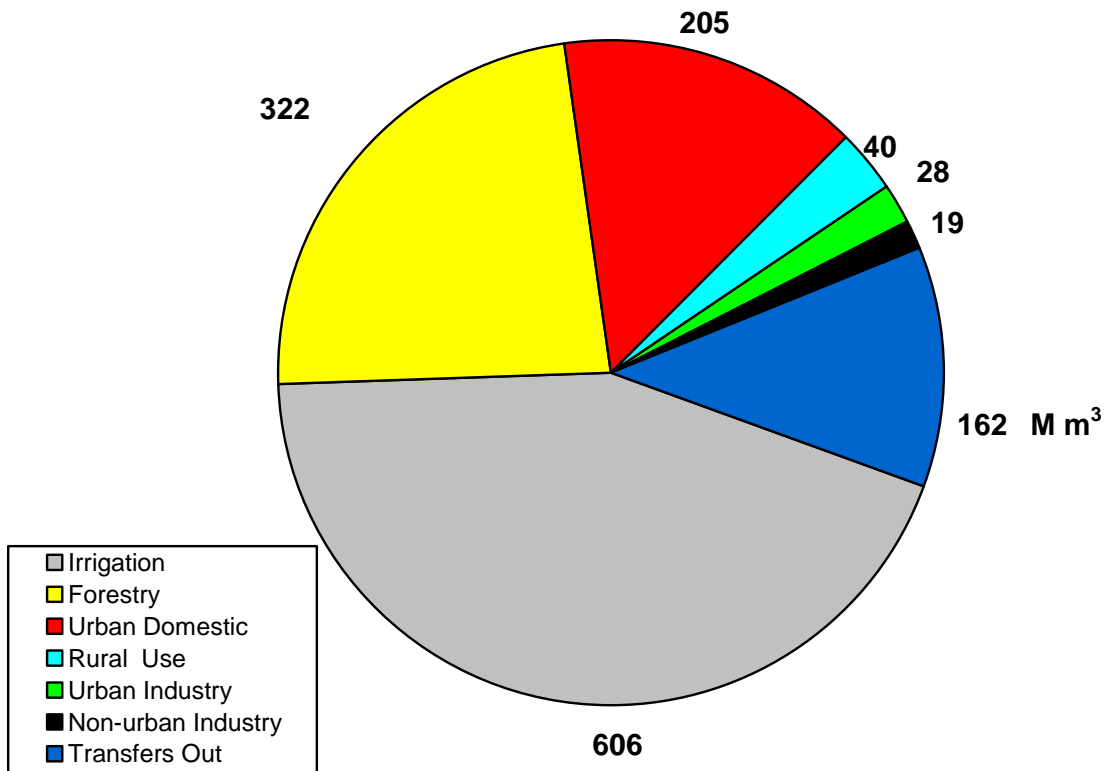
healthy condition, the ecosystems associated with the river. As can be appreciated, to evaluate this accurately is an extremely complex and difficult process.

An overview of the water use in this WMA is given in figure 3.1 below.

Unfortunately, at the time of writing, the model is not complete. As a result, it cannot give a breakdown by river or the evaluation of water use by alien plants, the environmental reserve requirements or the overall water availability. It is hoped that this information will be available later this year. Thereafter more detailed evaluation will be possible of which catchments are under stress at the current time.

An extremely important component in the above analysis is the Environmental Reserve (ER) determination. This gives an estimate of the water requirements to maintain, in a healthy condition, the ecosystems associated with the river. As can be appreciated, to evaluate this accurately is an extremely complex and difficult process. There are various “short-cut” techniques for evaluating the environmental reserve and these have been utilised in the Water Situation Assessment Study. To evaluate the ER more accurately requires that a study is undertaken by a multidisciplinary team of water and environmental experts. These studies are very expensive and they are thus being addressed on a prioritised basis by DWAF. Very few have been completed in the country and, at the time of writing, none are proceeding in this WMA.

Figure 3.1: Usuthu to Mhlatuze WMA water consumption figures (Mm³/annum) based on water use registrations as at 23rd August 2004 (excluding transfers, which are based on the capacities of transfer schemes)



3.5.1 Existing Permits and Registration of Water Users

Under the previous Water Act, permits had to be obtained for the construction of dams exceeding a certain volume and height of dam wall. These became known as Section 9b and 9c permits respectively.

Under the new National Water Act, a much more comprehensive registration process is currently taking place. Under this legislation, a much broader range of water users is required to register, including forestry, which was formerly addressed under the Forestry Act. In addition, all irrigators and those defined as carrying out “stream flow reduction activities” as well as others who abstract water such as industry, water boards and local government institutions, are defined as water users in the new Act and become liable for payment of water charges to CMA's. A summary of progress on the registration process is given in Table 3.3 below:

Sector	No. of Registrations	Ha	Water Use M m ³
Aquaculture	1	-	1
Irrigation	1374	71087	604
Other Agric	81	-	1
Forestry	2522	450366	322
Non-urban Industry	17	-	11
Urban Industry	17	-	28
Mining	8	-	8
Households-Urban*	108	-	205
Other	980	521453	-
TOTAL	5108	521453	1180

Table 3.3: Progress on water user registration (as at 23rd August 2004)

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This process involves the registration of an estimated 4000 water users in this WMA. This is a substantial logistical undertaking but is critically important because not only will it impact directly on the revenue base for catchment management but also, very importantly, the more users that are “brought into the net”, the lower will be the unit cost. Nothing like this process has ever been undertaken in the past. As a consequence, the final results are not completely clear at this stage. The figures for total number of users,

the areas involved and the amount of outstanding areas are very much estimates at this stage. It is also inevitable that some water users will “escape the net”, so the proportion of registrations is unlikely to exceed 80% in the first round.

3.5.2 Water Conservation Initiatives

In view of the long-term prognosis for South Africa’s water resources, DWAF has in recent years, started aggressively promoting initiatives to make more effective and efficient use of water. This has resulted in a number of significant projects and programmes being implemented in different parts of the country, focusing on aspects such as water demand management and alien plant eradication. Although this area has very plentiful water resources, water conservation initiatives will also be of importance. A major water demand management and conservation study is nearing completion in the Mhlathuze catchment. This includes a comprehensive assessment of all uses and users in the catchment as well as proposed strategies designed to improve water use efficiency.

Information on other water conservation initiatives within the WMA is sketchy however it does not appear that there are other major initiatives currently in progress, either within local government or other institutions.

Stressed Systems

Based on the current estimates, the Mhlathuze and Pongola River systems are over allocated and thus can be defined as ‘stressed’. The implication is that not a lot of water will be available from these systems unless there is a re-organisation of the current land use plans.

3.5.3 Cost Recovery

The Department of Water Affairs (regional office) currently has two different groups of major water users in the Province. The first group consists of Water Boards, Regional Councils, TLC’s and certain major industries such as Iscor. There are 19 of these and they are billed monthly. The second group consists mainly of Irrigation Boards and some farmers. There are 76 of these and they are billed every 6 months. Overall cost recovery for these customers is excellent with 100% achieved in the year 1999/2000. This yields an amount of R70 million.

Once the registration process referred to in section nine is complete, then it is estimated that there will be an amount of between 12 000 and 16 000 users throughout the Province. In the new dispensation these will all have to be billed by the CMA’s and possibly in the interim by the DWAF regional office. In certain cases these can be administered by an intermediary institution, which will reduce the numbers dealt with directly by the CMA to some extent. It nevertheless clearly represents a significant logistical challenge and a completely different scenario from the current situation.

Cost recovery amongst other institutions in the WMA varies greatly. It would appear that most of the local authorities are coping reasonably well although many are experiencing problems in the townships incorporated from the former KwaZulu administration. In the

rural areas the situation is much more problematic with virtually all the local government institutions, as well as DWAF, achieving very low levels of cost recovery.

3.6 WATERWORKS

The responsibility for operation of the major water resources infrastructure in the WMA is split between the KZN and national DWAF offices. The operation of the Middledrift transfer scheme has been delegated to the Mhlathuze Water Board. .

Water resources planning proposals in this area are dominated by the fact that it is blessed with plentiful water resources and is in reasonable proximity to a number of significant development nodes. This means it has become a target for a number of transfer schemes.

3.7 WATER RESOURCE MANAGEMENT

In the past, management of the water resources within the Usuthu to Mhlathuze Water Management Area was effected through a combination of Government Water Control Areas (GWCAs), Irrigation Districts, Water Boards and other relevant sections of the 1956 Water Act, with the Department of Water Affairs and Forestry (DWAF) acting as the responsible authority.

In terms of the National Water Act, it is now proposed to delegate water resource management to the water management area level. All irrigation districts and certain water boards are to be restructured as water user associations (WUAs), while the old Water Court is to be replaced by the Water Tribunal.

3.7.1 The National Water Act

A key provision in the National Water Act of 1998 is for the establishment of Catchment Management Agencies. These entities are geographically based with their boundaries coinciding, as far as possible, with river catchment boundaries. Ultimately it is foreseen that nineteen agencies will be established that will cover the whole of South Africa.

The broad purpose of CMA's is to manage water resources within their area of jurisdiction for the ultimate benefit of all stakeholders. Their initial functions have been identified in the Act as follows:

- *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 catchment management strategy;*
- *to promote the co-ordination of its implementation with the implementation of any development plan established in terms of the Water Services Act, 1997; and*

- *to promote community participation in the protection, use, development, conservation, management and control of the water resources in its water management area.*

In addition the Act stipulates that, in performing its functions, the CMA must:

Be mindful of the constitutional imperative to redress the results of past racial and gender discrimination and to achieve equitable access for all to the water resources under its control; strive towards achieving cooperation and consensus in managing the water resources under its control; and act prudently in financial matters.

3.7.2 The CMA Establishment Process

In July 2000, the regional office of the Department of Water Affairs (DWAF) initiated the process to establish Catchment Management Agencies in KwaZulu-Natal. Broadly speaking, this process will entail the following steps:

- i. Development of the proposals to establish the CMAs
- ii. Submission of proposal to the Minister of Water Affairs
- iii. Once the proposal is accepted, establishment of an Advisory Committee to advise the Minister on membership of the CMA Governing Board
- iv. Submission of recommendations to the Minister on the composition of the Governing Board
- v. Appointment of the Governing Board
- vi. Thereafter the CMA becomes formally operational

This process is shown diagrammatically in figure 3.2, overleaf, which demonstrates that the CMA proposal is a key element of the establishment process:

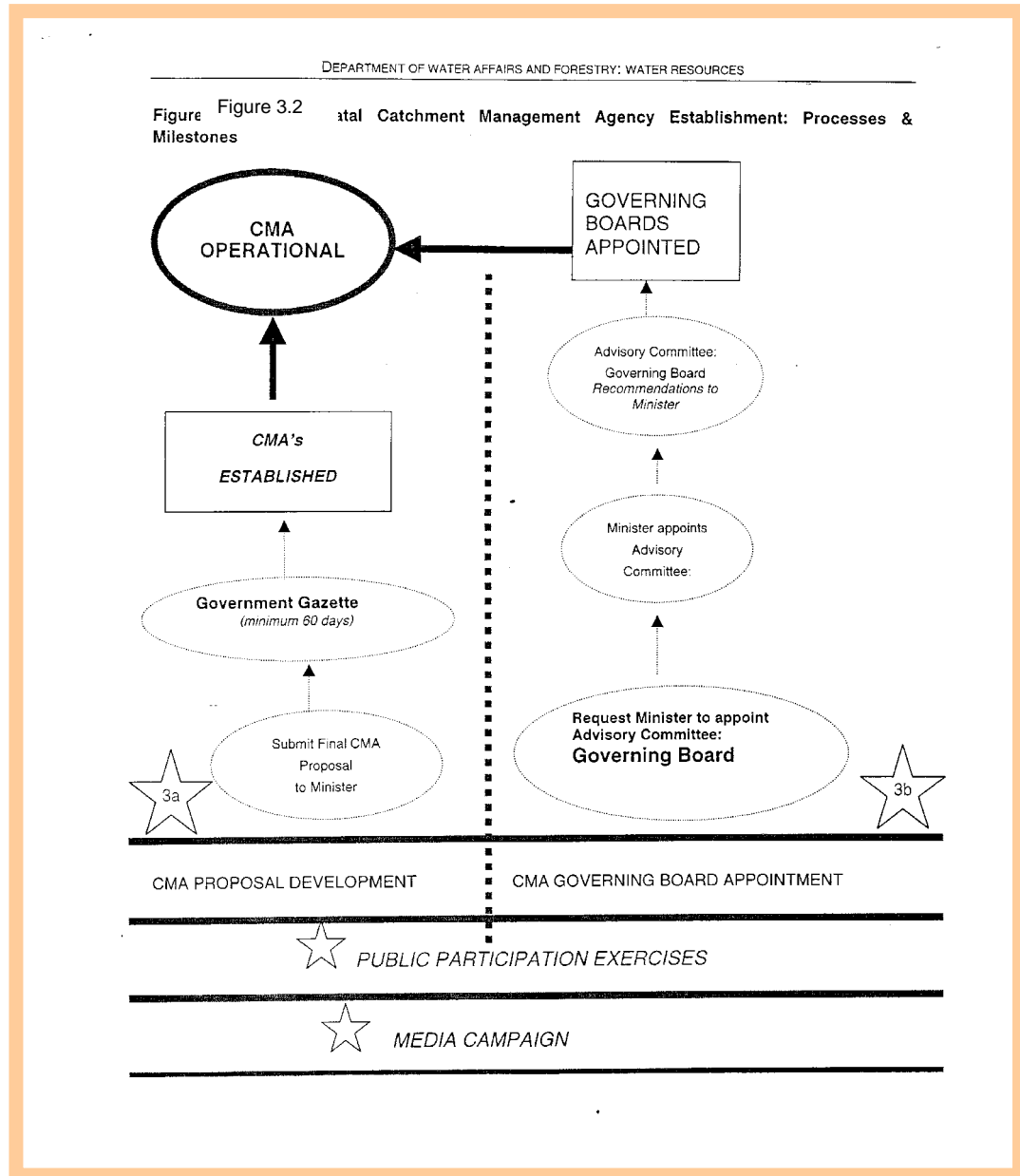


Figure 3.2: Proposed CMA proposal development process

Figure 3.2 illustrates the key roles played by the proposed Catchment Steering Forum and the Proposal Reference Group in the process. The Catchment Steering Forum is a non-statutory structure that should be broadly representative of all stakeholders in the WMA. Its role is to oversee the proposal development process and ensure that it fulfils the requirements of all the key stakeholders. The Proposal Reference Group will meet more frequently and will work closely with the team of DWAF and consultant personnel tasked with developing the necessary documentation. They will, in effect, guide the

development of the CMA proposal. The Proposal Reference Group will be a much smaller group than the Catchment Steering Forum (say 15 people) and its members will be nominated by the Catchment Steering Forum. The Reference Group will oversee the development of draft documents but the final approval will come from the Forum.

Figure 3.2 also emphasises that the situational assessment is an essential element in the process. Not only is it required for the final proposal which is sent to the Minister but it is also utilised to inform the Catchment Steering Committee to allow them to have the knowledge and common understanding to fulfil their role in guiding the proposal development process.

3.7.3 Institutional Arrangements within the Water Management Area

At a WMA level there are many institutions that have an impact on rivers and water

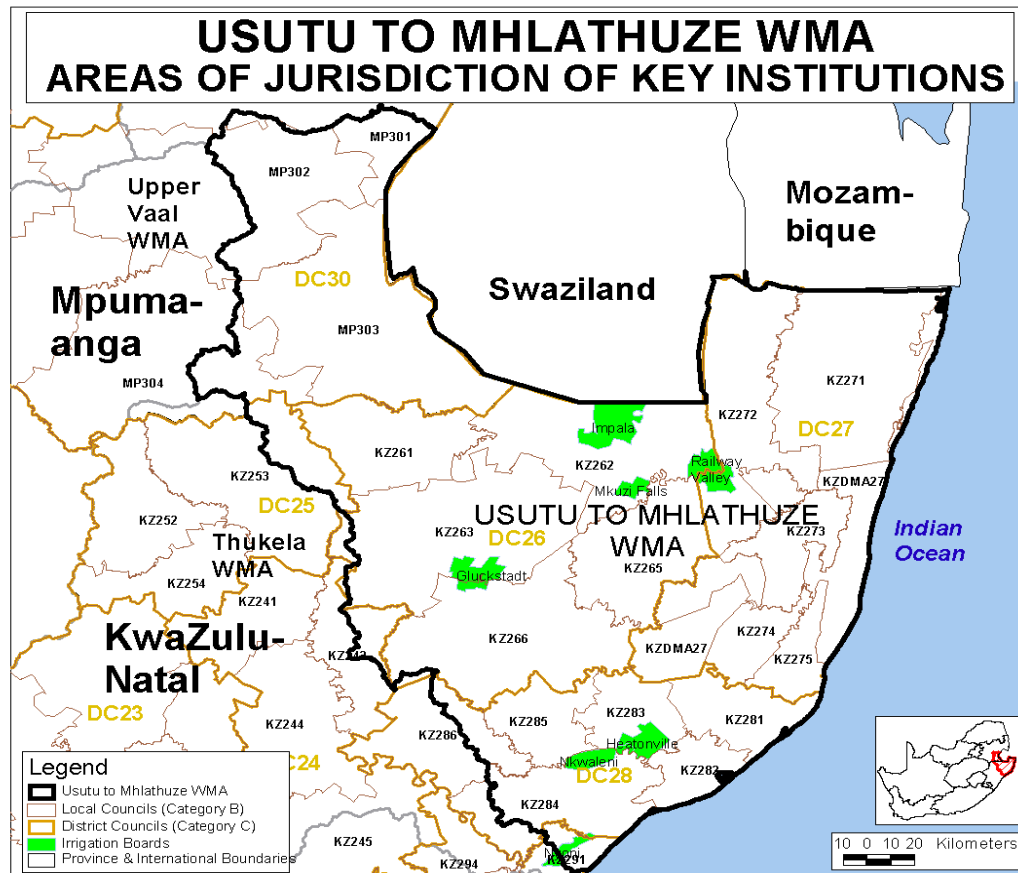


Figure 3.3: Areas of jurisdiction of key institutions in the WMA

In terms of the Water Services Act, District Municipalities are classified as Water Services Authorities (WSA). These have the primary responsibility for the provision of water services (water and sewerage) to the end customer. Water Services Authorities are clearly significant and important water users. As part of their responsibilities, they have to prepare Water Services Development Plans (WSDP's) which set out their master plan for the provision of water services to all those living in their area of jurisdiction. These WSDP's will clearly inform the water resources planning process and vice versa. As such they are important documents also for CMA's.

Irrigation Boards were a creation of the previous Water Act. Their primary function was to manage and administer the provision of irrigation water to farmers in particular parts of river catchments and to ensure the collection of levies necessary for payment to DWAF occurs to recover, at least partially, costs of infrastructure. Under the new legislation, they are obliged to register as Water User Associations (WUA). To be able to do this they have to demonstrate that their membership is representative of all stakeholders in their areas.

A number of catchment management fora (CMF) have been set up by DWAF in the last few years. These are voluntary organisations that have come together around a common interest in water resources for particular sub-catchments. According to sections 63 and 73 of the Act, CMA may choose to delegate some of their functions to these organisations

The most important regional institution which has an impact on water resources are the two Provincial Governments involved. The relevant provincial departments include:

- Traditional and Local Government Affairs
- Agriculture and Environmental Affairs
- Economic Affairs and Tourism

Other important organisations from a regional perspective are:

- The KwaZulu-Natal Agricultural Association (KwaNALU)
- KwaZulu-Natal Chamber of Business
- The Wildlife and Environmental Society of Southern Africa (WESSA)
- The KwaZulu Local Government Association (Kwanaloga)
- KwaZulu-Natal Irrigation Association
- Regional Consultative Forum (an NGO network)
- KwaZulu-Natal Rural Forum (an NGO network)
- South African Sugar Association (SASA)
- South African Timber Growers Association (SATGA)
- Forestry Industries Association

National institutions include the Department of Water Affairs and Forestry. In the absence of a CMA, the National Water Act [section 78 (1)] states that the Department must fulfill the role and this is particularly the case for the Regional office. By the same token, it is clear that many of the functions currently undertaken by the Department will ultimately be taken over by a fully functional CMA. As a result, it is foreseen by the Department that the requirement for a Regional Office will ultimately fall away once CMA's are fully functional. It is also the case that even some functions carried out at

national level will be taken over by CMA's, particularly if they are more effectively administered at a local level.

3.7.4 Regional Institutions

The most important regional institutions which have an impact on water resources are the KZN Provincial Government and, to a lesser extent, the Mpumalanga Provincial Government. In this regard, there are a number of Departments that have an interest in, and/or influence on, water resource and catchment management matters as follows (KZN Departments are listed, Mpumalanga Departments names may differ to some extent):

- Local Government and Housing
- Traditional Affairs
- Environmental Affairs
- Agriculture
- Economic Affairs and Tourism

The broad impact of CMA's would also indicate that the Premier's Office would be a stakeholder. In addition, it is interesting to note that the Provincial Growth and Development Strategy for KwaZulu-Natal not only identified water as an extremely important resource but also as a source of competitive advantage for the Province. It was noted that this creates significant opportunities for development in irrigated agriculture, wet industries such as paper and pulp, and tourism. These clearly have the potential for positive impacts in terms of employment and economic growth, again underlying the importance of sound catchment and water resources management to the region. The Mpumalanga government have also identified water as a critical resource for their province.

Other important organisations from a regional perspective are as follows:

- KWANALU (the KwaZulu-Natal Agricultural Union)
- KwaZulu-Natal Chamber of Business
- WESSA (the Wildlife and Environmental Society of Southern Africa)
- KWANALOGA (the local government association)
- KwaZulu-Natal Irrigation Association
- Regional Consultative Forum (an NGO network)
- KwaZulu-Natal Rural Forum (an NGO network)
- South African Sugar Association
- South African Timber Growers Association
- Forestry Industries Association

A number of these organisations are likely to be replicated in the Mpumalanga but at the time of compiling this report this information was not available.

3.7.5 Department of Water Affairs & Forestry

In the absence of a CMA, the Department fulfils the role and this is particularly the case for the Regional office. By the same token, it is clear that many of the functions currently undertaken by the Department will ultimately be taken over by a fully functional CMA. As a result, it is foreseen by the Department that the requirement for a Regional Office could ultimately fall away once all three CMA's are fully functional. It is also the case that even some functions carried out at national level will be taken over by CMA's, particularly if they are more effectively administered at a local level.

The current split of functions between the regional and national offices is summarised in table 3.4 below:

Function	Regional	National
Dam safety		✓
Water resources planning		✓
Pollution control	✓	
Forestry regulation	✓	
Hydrographic survey	✓	
Hydrology:	✓	
Data collection		
Hydrology: analysis		✓
Water drilling services	✓	
Geotechnical drilling	✓	
Geohydrology	✓	
Monitoring of Water User Associations	✓	
Environmental monitoring and rehabilitation of abandoned mines	✓	
Abstraction control	✓	
Water user licenses (and stream flow reduction licenses)	✓	
Water demand management		✓
Working for Water programme	✓	
Operation of government schemes	✓	
Betterments		✓

Table 3.4: Allocation of Responsibilities in DWAF

4. THE RELEVANCE & PROPOSED FUNCTIONS OF THE USUTHU TO MHLATUZE CATCHMENT MANAGEMENT AGENCY

4.1 THE IMPORTANCE AND RELEVANCE OF CATCHMENT MANAGEMENT

It is self evident that there is very little that is more fundamental to human existence than good quality water. The growth in world population is placing severe strain on water resources in many parts of the globe. This is so serious that some analysts believe that water related conflict has the potential to be the cause of wars in the new millennium.

It is well documented that, by international standards, South Africa is defined as an arid country with average rainfall, on average, being less than 500 mm *per annum*. This situation is made more complex by the fact that the rainfall in South Africa is unevenly distributed both seasonally and geographically. The net result of this is that it has been estimated that, at current rates of growth, South Africa's water resources could be exhausted in 20 to 30 years time. Evidence of this is already being manifested at a local level with some catchments experiencing substantial stress in terms of meeting water demands. This emphasises the need to manage our scarce water resources as effectively and efficiently as possible.

The impact of human activities has also had a significant impact on water quality. As a result, many important catchments experience severe pollution problems. This has a direct financial impact in terms of increased treatment costs necessary before the water is safe for human consumption. For many rural communities this situation is even more serious as they are directly reliant on the local rivers and streams for everyday water consumption. In some cases the rivers are so polluted that even human contact is hazardous.

Serious soil erosion problems are being experienced in numerous catchments. This is due to settlement densities that are beyond the carrying capacity of the land, coupled with poor agricultural practices. The result of this is that thousands of tons of valuable topsoil are being lost into the ocean every year.

Alien plant species are starting to have significant impacts on water resources. Infestation of the riparian zone is resulting in surprisingly large reductions of available water as a result of water consumption by these species. Other rivers experience problems of a different nature due to high levels of nutrients as a result of pollution. This encourages problems with prolific and highly problematic aquatic species such as water hyacinth, water lettuce and kariba weed.

It must furthermore be recognised that the successful management of water resources is an extremely complex process. Not only are river systems in an ongoing dynamic state but there are many competing water users in the catchment such as agriculture, forestry, industry, the environment, tourism, towns and cities and rural communities. All of these have a legitimate need for water.

Catchment management is both an approach and a philosophy which represents the response to the problematic scenario sketched in the above paragraphs. It recognises the systemic nature of the various processes impacting on water resources. As a result, it adopts a holistic and integrated approach to management. It recognises that there are many competing users and adopts a cooperative and collaborative approach to problem solving, the ultimate objective being achievements of mutual benefit of all stakeholders, both of current and future generations. It also places a very strong emphasis on local stakeholders having the major influence on decisions which impact on their catchment. South Africa's catchment management philosophy recognises the fundamental logic in adopting the catchment, as opposed to other political and administrative boundaries, as the most effective unit for management of water resource related issues.

4.2 FUNCTIONS OF A CATCHMENT MANAGEMENT AGENCY

The broad purpose of CMA's is to manage water resources within their area of jurisdiction for the ultimate benefit of all stakeholders. Their initial functions have been identified in the Act as follows:

- *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 catchment management strategy;*
- *to promote the co-ordination of its implementation with the implementation of any development plan established in terms of the Water Services Act, 1997; and*
- *to promote community participation in the protection, use, development, conservation, management and control of the water resources in its water management area.*

In addition the Act stipulates that, in performing its functions, the CMA must:

- *Be mindful of the constitutional imperative to redress the results of past racial and gender discrimination and to achieve equitable access for all to the water resources under its control;*
- *Strive towards achieving cooperation and consensus in managing the water resources under its control; and*
- *Act prudently in financial matters.*

The Usuthu to Mhlatuze CMA Proposal Development Working Group is confident that the capacity, technical expertise, financial resources and commitment exist in the water management area for the eventual assumption of all the functions listed in Schedule 3, as well as the licensing functions which can be delegated or assigned by the Minister in terms of Section 73(1)(a) of the National Water Act, 1998 (Act No. 36 of 1998).

The CMA approach recognises the integration of all environmental and social factors in the management of water resources. The approach forms part of an Integrated Water Resource Management (IWRM) approach. The IWRM is the idea that instead of the usual sectoral approach to developing and managing water resources, it is necessary to

recognise that river catchments are complex systems, in which use of water for one purpose has important implications for other uses.

Focusing attention on water catchments (a term used in this context to include surface and groundwater) enables a systematic approach, considering the socio-economic and human dimensions as well as the physical. Classical efficiency considers water flowing into drains as a "loss." But because of reuse, from a basin perspective one person's wasted drainage water is another's vital source. While efficiencies at field level may be low, in the same catchment the overall effective efficiency of a catchment may be quite high, and the "real" opportunities to save water by improving "efficiency" may therefore be limited.

This will be particularly so in the case of "open" and "closed" water systems. As population and economic growth increase the demand for water catchments will evolve from being "open" (where unused water is still available for additional uses) to being "closed" (where all useable flows are captured and distributed). Most water catchments in arid areas and even in non-arid areas are becoming closed catchments. This has very important policy implications. For example, as upstream uses reduce the quality or quantity of flows downstream, different users become increasingly interdependent.

Managing this interdependency is an important public function, which few developing countries are equipped to do. It is very difficult to develop effective institutional mechanisms to manage water systems, particularly where political or administrative boundaries do not coincide with watershed boundaries, or where competing partisan interests are powerful and entrenched.

In South Africa, the following factors aggravate the problems, which must be overcome, in planning for the future:

- ▶ The typical climate is semi-desert and the average rainfall for the country is just over half of the world average of 900 mm / annum.
- ▶ Rainfall is variable and droughts followed by floods are common occurrences.
- ▶ The distribution of rainfall varies significantly and the availability of water resources is very uneven, with approximately 60% of river flow arising from only 20% of the land area.
- ▶ South Africa has limited groundwater, which can be used for irrigation.
- ▶ Some of the metropolitan and industrial growth centres have developed around mineral deposits and are situated far from major water resources.
- ▶ South Africa's average evaporation rate exceeds its precipitation rate. Irrigation is therefore vital to stabilise and increase the production of food and fibre.
- ▶ South Africa has a population growth rate of around 1% *per annum*.
- ▶ South Africa is a developing country with a growing economy.

- ▶ The life style of South Africans is changing corresponding to an increase in *per capita* consumption.
- ▶ There is a large backlog of housing and basic services.
- ▶ Non-uniform payment for services in all water user sectors.

Catchment management is, therefore, both an approach and a philosophy that represents the response to the problematic scenario sketched in the above paragraphs. It recognises the systemic nature of the various processes impacting on water resources. As a result, it adopts a holistic and integrated approach to management. It recognises that there are many competing users and adopts a cooperative and collaborative approach to problem solving. The ultimate objective is the mutual benefit of all stakeholders, both of current and future generations. It also places a very strong emphasis on local stakeholders having the major influence on decisions which impact on their catchment. Catchment management recognises the fundamental logic in adopting the catchment, as opposed to other political and administrative boundaries, as the most effective unit for management of water resource related issues.

5. PRICING, SUBSIDIES & PHASING

5.1 WATER PRICING POLICY

5.1.1 Introduction

The Act empowers the Minister, in consultation with the Ministry of Finance, and after consulting with the public, to establish a pricing strategy for any water use described in section 21. The Act provides for three types of water use charges, which are for

Funding water resource management: activities such as information gathering, monitoring and controlling water resources and their use, water resource protection (including waste discharge and the protection of the Reserve), and water conservation.

Funding water resource development and use of waterworks: the costs of investigation, planning, design, construction, operation and maintenance of waterworks, pre-financing of development, a return on assets, and the costs of water distribution. (Resource management and resource development charges are financial charges, which are directly related to the costs of managing water resources and supplying water from schemes and systems).

Achieving the equitable and efficient allocation of water: economic incentives to encourage more efficient use of water, water conservation, and a shift from lower to higher value uses. (This is an economic charge, and relates to the value of water to particular users).

The objective of the new approach to water pricing is to contribute to achieving equity and sustainability in water matters by promoting financial sustainability and economic efficiency in water use. Accordingly, the ultimate intention of the pricing strategy is to ensure that the real financial costs of managing water resources and supplying water, including the cost of capital, are recovered from users.

5.1.2 The Pricing Strategy for Water Use Charges

Important Note: *The pricing strategy, which relates to charges for any water use, is established in terms of the process described in section 56 of the Act.*

The pricing strategy applies only to the use of raw (untreated) water directly from or in respect of water resources, and to the setting of tariffs by the Department and water management institutions established in terms of the Act. It does not deal with treated water supplied in bulk (by water boards, for instance) and distributed to households (via water services authorities), which is dealt with in the Water Services Act, 1997. There is, nevertheless, an explicit requirement in the Act to ensure that the pricing strategy supports the establishment of tariffs for water services in terms of the Water Services Act.

The water uses described in section 21 are sufficiently different to warrant different approaches to determining charges. The overall pricing strategy will therefore comprise a

number of distinct components - described below - each of which will be established separately, and implemented progressively over time.

5.1.2.1 Abstracting & Storing Water & Stream Flow Reduction Activities

In the first component, charges will apply to three consumptive uses of water which can be expressed in terms of annual volumes of water used:-

- Abstracting (taking) raw water directly from surface and groundwater resources (section 21(a));
- Storing water (section 21(b)). In this case the use is abstracting water from storage or, in the case of dams constructed to enhance property values or for recreational use, initial filling and annual refilling ^[1]; and
- Engaging in a stream flow reduction activity (section 21(d)). Thus far only the use of land for afforestation which has been established for commercial purposes has been declared to be a stream flow reduction activity. Other land-based activities are being considered, and may be declared in future in terms of section 36.

5.1.2.2 Waste Discharge Charge System

This component of the pricing strategy is currently being developed, and will be published for formal comment during 2002 and established in 2003, in terms of section 56. It will deal with charges for all aspects of waste discharge, as follows:-

- Engaging in a controlled activity (section 21(e), and section 37(1)(a) and (d) also refer);
- Discharging waste or water containing waste into a water resource (section 21(f));
- Disposing of waste in a manner which may detrimentally impact on a water resource (section 21(g));
- Disposing of water which contains waste from any industrial or power generating process (section 21(h)); and
- Aspects of removing, discharging or disposing of water found underground (section 21(j)).

The system will be based on the polluter pays principle. It will address point and diffuse sources of pollution. It will supplement the more traditional regulatory approach to water quality management, in which standards and objectives are set and enforced, by introducing financial and economic incentives and disincentives to:-

- Ensure that the costs of polluting activities are, as far as possible, borne by the polluter (internalised), and not passed on (externalised) to other water users who could be disadvantaged by the detrimental impacts of waste on water resources;
- Encourage the minimisation of waste discharge; and

- Promote efficient and effective water use.

Charges made under the system will reflect the direct and indirect costs associated with the discharge or disposal of waste. Accordingly, key representative pollutants and the costs for reducing the impacts of various categories of pollutants will be identified, and methods for determining the direct costs of impacts will be developed. Revenues from the charges will be used to fund water quality management activities related to waste discharge or disposal, such as impact monitoring and mitigation, providing assistance to users to reduce the impacts of their discharges or disposal activities, and system administration.

5.1.2.3 Other Components of the Pricing Strategy

The Department is considering the necessity for and practicality of introducing further components of the pricing strategy for the other aspects of water use, which deal with impeding or diverting flow in a watercourse (section 21(c)), altering the physical characteristics of a watercourse (section 21(i)), and for the use of water for recreational purposes (section 21(k)). Any proposals will be published for comment in terms of section 56.

5.1.3 Pricing Strategy for Abstracting and Storing Water, and Stream Flow Reduction Activities

Important Note: This component of the pricing strategy has already been established, after public consultation, by the publication of Government Notice No. 1353, 12th November 1999. This section provides details of how the strategy will be implemented.

5.1.3.1 Setting Charges, Collecting and Disbursing Revenue

Catchment management agencies will be established in each of the 19 water management area. Each agency will be progressively empowered to undertake water resource management responsibilities, including setting charges and collecting revenue for water use in its area of jurisdiction. Charges may therefore differ between water management areas, depending on the socio-economic circumstances, and physical and demographic characteristics and attributes of each area.

However, until catchment management agencies are established, the Department will continue to determine charges and collect revenue. When the agencies are established, the Department will work with them to set charges. In respect of the charges for water resources management activities, which are intended to fund the agencies, the Department will ensure that revenue is passed on to them for the activities for which responsibility has been delegated or assigned to them.

After budgets have been prepared and proposed charges determined, they will be announced and made known to users prior to the beginning of the financial year during which they will be imposed.

5.1.3.2 Water user sectors

All charges will be specific to each of four end-user sectors:

- Municipal (water services authorities);
- Industrial, Mining and Energy;
- Agriculture; and
- Stream Flow Reduction Activities.

Charges may be different for each user sector, depending on the costs of and benefits from water resource management services, or from the use of a particular supply scheme.

5.1.3.3 Charges for Funding Water Resource Management

These charges will be based on the budgeted¹ annual costs of the following activities, which will eventually become the responsibility of catchment management agencies:-

- Planning and implementing catchment management strategies.
- The costs of catchment management agency establishment, and any costs incurred by the Department in preparing preliminary/interim catchment management strategies prior to the establishment of an agency, are excluded from the charge.
- Monitoring and assessment of water resource availability and use, and resource quality.
- Management of water allocation and utilisation.
- Water quality management, including waste control and pollution control in respect of mines, industries, agriculture and dense settlements.
- Charges will not include costs related to waste discharge, or the capital costs of abandoned mine rehabilitation, until the waste discharge charge system is implemented.
- Dam safety control.
- Water conservation and demand management, including the control of invasive alien vegetation under the Working for Water Programme, education and awareness creation by the Water Education Programme (formerly the 20/20 Vision for Water Programme), and control of aquatic weeds.

¹ Until the management of assets is transferred to other institutions, the Department will continue to undertake budgeting and revenue collection by means of the Bulk Water Supply and Integrated Systems components of the Water Trading Account created for these purposes.

- Costs related to poverty relief activities, which do not directly contribute to improving water availability, are excluded from the charge.

5.1.3.4 Application of Water Resource Management Charges

The charges relate to all water used within the water management area, irrespective of whether water is taken direct from the resource or supplied from a government or water management institution scheme. In any water management area, charges will be imposed only when the majority of water use is either licensed or registered. Some aspects of the charges will apply to user sectors in different ways, as follows:-

- Because there is no requirement for water that is used in terms of Schedule 1 to be registered, such use will not be charged for.
- The municipal sector will attract all charges relating to water resource management.

Important Note: *The Pricing Strategy for Raw Water Use Charges provides for that portion of a municipality's annual raw water demand that comprises the basic human needs component of the Reserve to be free of charge. However, since the Pricing Strategy for Raw Water Use Charges was established, Government has indicated that equitable share grants, made to municipalities in terms of the annually-enacted Division of Revenue Act, should enable water services authorities to fund the provision of free basic water. The cross-subsidisation of raw water in terms of the pricing strategy, described above, will therefore not be implemented, to avoid double subsidisation and to reduce administrative complexity.*

- The industrial, mining and energy sector will attract all charges relating to water resource management.
- The agricultural sector will attract all charges except those related to subsidising the control of invasive alien vegetation under the Working for Water Programme. Charges for emerging farmers using water from government water schemes will be subsidised, at a progressively decreasing rate, for five years.
- The stream flow reduction activity sector will attract all water management activity costs except those related to dam safety control and control of invasive alien vegetation.

Unit charges (cents per cubic metre) for each water management area will be determined for each sector. These unit sectoral charges will be applied to the annual volume registered by each water user for billing purposes. Volumes will be based on estimated long-term average annual use (reduction in runoff in respect of stream flow reduction activities), thus taking assurance of supply into account. Charges will be based on recovering the costs of managing the total volume of water that may be allocated for use in each water management area. This is determined by deducting the requirements of the Reserve, water required to meet international obligations, water required for future transfers of water between water management areas, and water for use of strategic importance from the total volume of water available in the area.

In water management areas where all available water is utilised, or where there is an over-allocation (that is, total registered use exceeds total available for allocation), charges for each sector will be based on the registered sectoral use. In water management areas where the total registered water use is less than the total water available for allocation, charges will be based on the estimated maximum sectoral use, such that the total use equals the total allocable water. This will result in an under-recovery of revenue, which will be made good by an operational subsidy from the *fiscus*, and which will be phased out progressively until all available water has been allocated. The quantity of allocable water at an appropriate assurance of supply will be determined for each water management area.

5.1.3.5 Inter-Basin Transfers of Water

Transfer of water from one water management area to another will result in a reduced quantity of water on which charges can be made in the source area, and a corresponding increase in the receiving area. Some of the charges raised in the receiving area, from those user sectors that benefit from the transferred water, will revert to the source area for water resource management purposes. The Department will determine a framework for the calculation and disbursement of the relevant amounts. In the case of the Usuthu to Mhlatuze CMA inter-basin transfers occur to the Upper Vaal WMA and are received from the uThukela WMA. The feasibility model takes account of the revenue due to the Usuthu to Mhlatuze CMA for water transfers to beneficiary WMAs based on a percentage (as advised by DWAF) of the Usuthu to Mhlatuze CMA total costs in the case of transfers out and based on a percentage (as advised by DWAF) of the uThukela CMA total projected costs in the case of transfers in. (See Appendix 7.3).

5.1.3.6 Charges for Funding Water Resource Development and the Use of Waterworks

Differential charges will be imposed on users of water from government water schemes and systems, and from schemes funded by other water management institutions (catchment management agencies and water user associations) and will be based on volumes of water used. Fixed and/or variable charges may be implemented.

5.1.3.7 Waterworks Owned and/or Managed by other Water Management Institutions

Charges set by catchment management agencies and water user associations in terms of the pricing strategy must be based on the legitimate functions of the institution (initial, delegated and assigned in the case of catchment management agencies, and according to its constitution in the case of a water user association), and must make provision for the full recovery of capital costs (including the costs of servicing loans), depreciation of assets, water resource management, operation and maintenance, and associated overheads, and other charges imposed by law (such as water resource management charges and Water Research Commission levies).

5.1.3.8 Application of Water Resource Development and Use of Waterworks Charges

Charges will be phased in progressively over time, and the target of achieving full cost recovery will therefore be achieved at different times for different sectors.

- Municipal sector: On government water schemes charges will include depreciation, return on assets², and operations and maintenance. Annual tariff increases over current tariffs will be limited to [producer price index+10%] until target recovery is achieved, with increases thereafter limited to the rate of inflation. All costs must be recovered in respect of waterworks owned by other water management institutions.
- Industrial, mining and energy sector: On government water schemes charges will include depreciation, return on assets, and operations and maintenance. Annual tariff increases will be limited to [producer price index+10%] until target recovery is achieved, with increases thereafter limited to the rate of inflation. All costs must be recovered in respect of waterworks owned by other water management institutions.
- Irrigation sector: On existing government water schemes, charges will include depreciation, and operations and maintenance. Existing tariff agreements with commercial farmers remained in place until March 2001. Further agreements have subsequently been concluded with organised agriculture. The depreciation charge will be phased in from April 2001 until depreciation plus the costs of operations and maintenance are fully recovered, in terms of the agreements. For emerging farmers supplied from government water schemes operations and maintenance charges will be decreasingly subsidised over a five year period, and phased in thereafter until depreciation plus the costs of operations and maintenance are fully recovered.
- Stream flow reduction sector: These charges do not apply, except in cases where new developments are required, when charges will be negotiated with users.

5.1.4 Other Sources of Revenue

In the discussion paper: “Policy Framework on the Financial Arrangements of Catchment Management Agencies” – Version 3.0”, dated August 2003 the following statement is made in paragraph 2.1.1:

“The Pricing Strategy does not imply that these are the only functions that may be recovered through user charges.

A CMA may be involved in a range of other activities that do not necessarily coincide with these categories, but are core to its mandate, particularly around institutional coordination and extending stakeholder participation. There may also be additional potentially non-core activities that the CMA is involved in, but where these are related to the role the CMA plays in WRM, they may also be recovered

² For government water schemes the portion of the charge relating to return on assets will apply only to the municipal, and industrial, mining and energy sectors, as these are the sectors for which the demand for water from government schemes is expected to increase. Historical growth rates in these sectors' demands indicate that an annual average rate of return of 4% applied to the current depreciated replacement value of water infrastructure will achieve a breakeven return.

through water use charges. The only constraint would be for functions and activities that are not WRM in nature.

A CMA may recover any of the costs of the functions required to exercise its powers or carry out its duties in terms of the NWA [under Section 84 of the NWA], even where these go beyond the categories referred to in the Pricing Strategy.

This may include the CMA staff costs, overheads, programme/project costs and capital expenditure, as well as costs associated with contracting or outsourcing³ part or all of a particular function to another WMI, public sector organisation or service provider.”

No additional revenue as envisaged in paragraph 2.1.1 of the discussion paper has been assumed in the financial model.

The Working for Water Programme has been treated as an outsourced programme to be managed on a contracted basis by the CMAs, with the Department of Water Affairs and Forestry (DWAF) responsible for all costs and revenue associated with the programme, apart from a modest level of cost incurred by the CMAs in managing the programme on behalf of DWAF.

Other potential sources of revenue identified in the discussion paper are:

5.1.4.1 Recreational Concessions

Once the concession process for recreational water use has been established, the CMA may become responsible for implementing, administering or overseeing some of these concessions. This may provide a source of funding for the CMA to cover relevant administrative (and possibly even WRM) costs, but this depends upon the nature of the concession, the management arrangements and the resource being used.

5.1.4.2 Licence Application Fees

DWAF collects an administrative fee for processing license applications. The CMA would perform related activities, including discussing and reviewing the application⁴, and ultimately evaluating the license (once it is the responsible authority).

The CMA should receive some of the license application fee as soon as it is performing licensing functions, and ultimately should receive the entire fee once they are the responsible authority.

5.1.4.3 Donor support and Sponsorship

³ This will require specifications / guidelines on procurement, contract conditions and appropriate payment for services by CMAs.

⁴ Some of the cost is incurred in the compilation of the license application, and so the CMA should receive some of the fee once it is performing water use control functions.

A CMA may fund its activities through any lawful source other than water user charges and parliamentary appropriations, which may include donor support or sponsorship. However, transparency must be maintained, as actual or perceived conflict of interest must be avoided. This should include constraints over the types of functions that may be supported, particularly from bodies with a vested interest in the WMA, and possible approval by DWAF of sponsorship and donor contributions.

5.1.4.4 Contractual Payments

The CMA may perform ancillary functions outside of its WMA, as well as non-WRM activities that are related (incidental) to its functions or mandate (where this has been contracted or delegated by another institution), as long as this does not jeopardise its functions or detrimentally affect another WMI. This implies that adequate funding by the other institution must be linked to the contracted or delegated function.

5.1.4.5 Returns on Investments

In some years the CMA may generate a surplus and may invest this in low risk financial investments (with Treasury approval). The income generated from these investments may be used to operate the CMA, or may be "ring-fenced" for social projects related to stakeholder beneficiation.

5.1.4.6 In-kind Contributions

Although in-kind contributions are not explicitly income, they would reduce the expenditure and required income of the CMA. They are most relevant for institutional development and stakeholder participation related functions, but may include other bodies involved in monitoring and other WRM activities coordinated by the CMA.

As a conservatism none of these additional revenue source have been taken into account in the financial model. In addition the basic human needs reserve has been assumed not charged as opposed to the suggestion in paragraph 2.1.3 of the discussion paper that this should be recovered from municipalities.

5.2 FINANCIAL ASSISTANCE

Financial assistance to water users may be provided in two ways.

By means of the pricing strategy:-

Current policy is that all charges for water provided from government water schemes to emerging farmers will be decreasingly subsidised for a period of five years.

By means of the section 61 of the NWA:-

Capital cost subsidies (at present limited to the least of R10 000 per hectare, R50 000 per person, or a person's actual share of the cost of the scheme if it is less than R50 000) are available to emerging farmers who are members of water user associations, for the construction or refurbishment of communal waterworks.

- Operational subsidies to water user associations which take over the operations and maintenance of government water schemes.
- These subsidies comprise:
 - o A once-off subsidy of 50% of the operations budget;
 - o Exemption from payment for depreciation charges in respect of canals; and
 - o A subsidy to phase in tariffs for emerging farmers over 5 years.

These policies are currently the subject of an inter-departmental review.

This assistance is provided independently of CMAs and has not been factored into the proposal financial model. Furthermore, no provision has been made in the CMA models for exchequer financial support for activities of the CMA that are directed to matters of national interest nor in respect of the requirement of any WMA to meet international requirements. (This is dealt with in paragraphs 2.1.3 and 3.3.3 of the discussion paper: "Policy Framework on the Financial Arrangements of Catchment Management Agencies" – Version 3.0", dated August 2003).

Water use charges on waste discharge are assumed from the fourth year of operation. (Paragraph 2.2.1 of the discussion paper: "Policy Framework on the Financial Arrangements of Catchment Management Agencies" – Version 3.0", dated August 2003).

5.3 DETERMINATION OF THE WATER RESOURCE MANAGEMENT CHARGE

5.3.1 Introduction

In terms of section 57 of the National Water Act, 1998 (NWA), water resource management agencies (CMAs) may make water use charges within a specific water management area (WMA) which must be in accordance with the pricing strategy set by the Minister in terms of section 56(1).

The Pricing Strategy for Raw Water Use Charges, which was promulgated on 12 November 1999, determines how CMAs must set the so called water resource management (WRM) charge for funding the cost of the management activities listed under section 56(2)(a) of the NWA. In broad terms, the WRM charge is intended to recover the budgeted costs of administrative activities related to the planning and implementation of water resourced management strategies, gathering information, monitoring, controlling and protecting water resources, water use allocations, dam safety

control and water conservation. The cost of the Working for Water programme will also be partly recovered by the WRM charge and is supported by a State subsidy.

The WRM charge will initially only be imposed on abstractive uses of water (abstraction from surface and groundwater resources and from storage, and also the reduction of stream flow caused by afforestation). A pricing strategy for waste discharges is presently being developed and will in future provide a part of the WRM charge. The WRM charge must be determined as a unit charge in cents per cubic metre, which will vary between sectors and will be invoiced on the annual volumes of registered and licensed water use as captured in WARMS. Registered volumes will be based on estimated long term average annual water use and application of the unit charges will thus lead to fixed annual payments, regardless of actual water use.

In terms of the NWA, the Department of Water Affairs and Forestry (DWAF) will initially act as CMA and for this purpose an Integrated Water Resource Management Trading Account (ICMTA) was created against which the budgeting and revenue collection for DWAF acting as CMA can be accounted for. DWAF will continue to perform all the functions related to water resource management as captured in the ICMTA until the CMA is established and these functions can be progressively delegated or assigned to them.

As soon as a CMA has been established and is ready to take responsibility for performing certain water resource management functions, the authority to perform these functions will be delegated to them and they will be assigned the responsibility for co-ordinating the budgets and the setting of charges for water resource management within the WMA. DWAF remains responsible for performing the functions not delegated and will continue to use the ICMTA as vehicle for budgeting and pricing purposes in respect of these functions and for the payment of any operational subsidies to the CMA. The Minister will direct the CMA in terms of section 58(1) of the NWA, to recover the charges for water use set by DWAF, together with charges set by the CMA, from water users within the WMA.

The financial year of a CMA must be in accordance with section 32 of Schedule 4 of the NWA, be for a period as determined by the Board. Due to the fact that DWAF will share the financial responsibility for budgeting and water pricing for an interim period with the CMA, it is essential that April to March be adopted as financial year until all functions have been delegated. The CMA must announce water resource management charges before the beginning of the financial year, including the component of the charge accruing to DWAF, and determine payment dates within the financial year for each user sector.

The pricing strategy does not make provision for the transfer of money from one WMA to another through cross-subsidisation. However, where an inter-basin transfer of raw water between WMAs for purpose of water resource augmentation is involved, the pricing strategy determines that the donor CMA must be compensated for the potential loss in revenue, which will be made good by a transfer of a portion of the monies raised by water use charges in the receiver WMA. An inter-basin transfer of raw water between WMAs will be affected as a result of water allocations made in terms of the national water resource strategy (NWRS). An example of an existing raw water transfer scheme is the uThukela Middledrift Dam Scheme.

Run-off or stored water originating from an upstream WMA and which flows or is released to the WMA located downstream on the same river system is not regarded as an inter-basin transfer for purposes of determining the WRM charge. Under these circumstances

CMA's can enter into a payment agreement where upstream management is required to provide adequate water to a downstream water management institution.

This guideline deals with the budgeting and costing process that must be followed by DWAF for determining annual charges for funding those water resource management activities on the ICMTA that have not been delegated or assigned to CMA's.

5.3.2 Budgeting per WMA

CMA's must develop their own budget and cost accounting systems that are consistent with the requirements laid down for business planning in Schedule 4 of the NWA. They must also set sectoral charges in accordance with the Pricing Strategy, taking cognisance of such a portion of the charges as determined in terms of this guideline, which must be collected and paid over to DWAF.

Regions must subdivide their total budget allocations for the ICMTA between WMAs in respect of the under-mentioned water resource management activities provided for. The relevant budget figures must include the cost of gathering information, monitoring, public participation and support, where applicable. Typical expense headings will be:

- FUNCTIONAL SUPPORT
- PLANNING AND IMPLEMENTATION OF CATCHMENT MANAGEMENT STRATEGIES
- DAM SAFETY CONTROL
- POLLUTION CONTROL
- SOLID WASTE CONTROL
- WATER ALLOCATION
- WATER USE CONTROL
- WORKING FOR WATER
- 20/20 VISION
- WATER WEEDS (HYACINTH)
- DEMAND MANAGEMENT

5.3.3 Determination of Sectoral WRM Charges Per WMA

5.3.3.1 Determine Annual Sectoral Use Volumes per WMA for Pricing Purposes

The total volume of registered water use per WMA as captured by WARMS must be compared with the total allocable yield of resources within the WMA, in terms of the NWRS. This volume must exclude the quantities set aside for the Reserve, international obligations and for transfer to other WMAs. If the allocable yield is bigger, the registered water use per sector must be adapted pro rata upwards. If smaller, the volume of use registered per sector must be used for pricing purposes. The volume per sector that is subject to pricing must then be determined by subtracting the registered volumes of users falling below the cut-off value, which will be excluded from invoicing, as may be determined by the CMA in accordance with the Pricing Strategy. Volumes must be determined for the following sector groupings:

V1: Domestic / Municipal / Industrial / Mining / Energy / Evaporation*

V2: Agriculture (irrigation, intensive stock-watering)

V3: Stream flow reduction (Forestry)

*In terms of the Pricing Strategy, the annual evaporation from dams constructed for non-productive purposes, may under certain circumstances be priced.

5.3.3.2 Divide the budgeted cost related to functional support, which entails overheads, between ICMTA expense headings using time-based costing. (This must also include the cost of billing and collection of charges).

Time-based costing division of overheads implies that overhead costs will be divided between the ICMTA budget items on the basis of time spent by the relevant water management institution on each water resource management activity, rather than on some other basis, such as size of the budgeted expenditure for each activity.

5.3.3.3 Determine what portion of the ICMTA budget must be taken into account for setting sectoral water resource management unit costs for pricing purposes

a) Non-recoverable costs

To avoid the setting of unaffordable charges and to level the playing field in respect of all WMAs, the non-recurring upfront costs related to situation analyses, establishment of CMAs and public participation must be excluded from price setting.

The Pricing Strategy determines that only the administrative cost (personnel related expenditure and professional services) of water quality management must be taken into account in determining charges for the interim period before the pricing strategy for waste discharges can be promulgated as part of the raw water pricing strategy. Certain budgeted items on the ICMTA must therefore initially not be included in the determination of unit costs for pricing the abstractive uses of water. The exclusion of certain costs will lead to reduced charges and under-recovery of revenue, which will be subsidised by DWAF. Costs to be taken into account are shown in table 5.1 overleaf:

b) *Inter-basin transfer costs in respect of donors CMAs*

On the advice of DWAF head office, the water source management charges relating to inter-CMA transfers of raw water have been assumed recovered as fixed percentages of the donor CMA's costs, which percentages were supplied by DWAF officials from head office. This is at variance with suggestions in this regard contained in paragraph 2.1.3 of the discussion paper: "Policy Framework on the Financial Arrangements of Catchment Management Agencies" – Version 3.0", dated August 2003. We have kept the financial model in line with the advice given by DWAF.

The fraction of the budget in respect of the donor CMA, which must be recovered from the water users in the receiver CMA, is equal to the ratio of the annual volume to be transferred, to the total utilisable yield of resources in the donor WMA in accordance with the NWRS. This fraction and cost will be determined annually by DWAF in collaboration with the relevant CMAs and will result in an equivalent reduction of the ICTMA costs to be taken into account for pricing in the donor CMA

ICMTA COST ITEM	Costs to be taken into account for pricing
Planning and implementation of catchment management strategies	Establishment costs in respect of CMAs budgeted under this item, must be excluded from WRM pricing and upfront costs in respect of catchment management strategies before the establishment of CMAs must also <u>not</u> be taken into account. The development of catchment management strategies is one of the main initial functions of a CMA and they must be in control of the budget of this cost item in order to be accountable to their water users.
Transfers from another WMA	Exclude the cost related to the development of catchment management strategies in respect of waste discharges at effluent treatment works where abstraction of the relevant water takes place in another WMA.
Dam safety control	Full costs to be taken into account.
Pollution control	Exclude costs related to waste discharge where the abstraction of water takes place in another WMA. Only personnel / consultant related costs must be taken into account.
Solid waste control	Full costs to be taken into account.
Pollution control on mines	Exclude capital costs related to rehabilitation of abandoned mines.
Water allocation	Exclude cost of waste discharge allocations where the abstraction of water takes place in another WMA.
Water use control	As above for control costs.
Working for water	Exclude poverty relief activity costs that do not contribute to improving water availability for water users within the WMA.
20/20 vision	Full costs to be taken into account.
Water weeds, e.g. hyacinth	Full costs to be taken into account.
Demand management	Full costs to be taken into account

Table 5.1 Costs to be taken into account for pricing

5.3.3.3 Determine sectoral unit costs per cost item by dividing item costs by total sectoral volumes

The costs of the following items must not be allocated to the forestry sector:

- ❑ Dam safety control
- ❑ Working for Water

5.3.3.5 Determine water resource management unit charges per sector by taking subsidies into account

A 90% subsidy on the unit cost of the Working for Water programme must be taken into account for the agricultural sector.

5.3.3.6 Inter-basin transfer input costs in respect of receiver CMAs

These will constitute an input cost for the determination of charges in the receiver WMA. These input costs must be recovered from those user sectors in the receiver WMA which will benefit from this transfer. An example here is the Mooi-Mgeni transfer which will benefit only the domestic / industrial users (V_1) in the Mvoti-Umzimkulu WMA and those users must bear the additional cost.

5.4. OPERATIONAL SUBSIDIES PAYABLE TO CMAS

During the period when DWAF is performing certain functions on the ICMTA on behalf of a CMA, the subsidisation of the operational cost of these functions will be accomplished indirectly, i.e. through the budgeting and pricing process described in this guideline. This means that certain costs will not be taken into account for setting charges and will result in an indirect subsidy through the under-recovery of revenue on the ICMTA. These indirect operational subsidies, which will be phased out over a period of time, are as follows:

- ❑ The under-recovery of revenue in underdeveloped WMAs where the total yield of resources (allocatable water in terms of the NWRS) is higher than the volume of registered and licensed use as captured on WARMS and where sectoral charges must be set at the lower level, conforming with the higher use volume.
- ❑ The under-recovery of revenue stemming from the fact that certain upfront costs before the establishment of CMAs and costs related to waste discharge management will not be taken into account.

As soon as a CMA takes over the mentioned WRM functions from DWAF under delegated authority, the subsidisation of operational costs related to a particular function via the ICMTA will be replaced by the payment of direct operational subsidies

in terms of section 61 of the NWA, which must be submitted to the Minister for approval on an annual basis, and must be properly accounted for on the ICMTA for a particular WMA.

5.5 OPERATIONAL AND TECHNICAL SUPPORT

The Catchment Steering Committees for the various catchments and the uSuthu to Mhlatuze CMA Reference Group have committed themselves to the assumption, by the uSuthu to Mhlatuze CMA, of all possible delegated and assigned functions as soon as possible.

Before DWAF can delegate or assign functions in terms of Chapter 2 and sections 72 and 73 of the National Water Act, 1998 (Act No. 36 of 1998), however, the uSuthu to Mhlatuze CMA has to establish Operational and Technical Support (O&TS) arrangements in terms of which the above listed water resource management tasks can be undertaken. The uSuthu to Mhlatuze CMA will develop its O&TS arrangements in a phased manner and will examine a range of staffing and outsourcing arrangements in the process. At each stage of the development of O&TS arrangements, the uSuthu to Mhlatuze CMA Governing Board will present to DWAF evidence of its readiness to undertake new functions. Such evidence will include information on human resources and systems at the disposal of the uSuthu to Mhlatuze CMA.

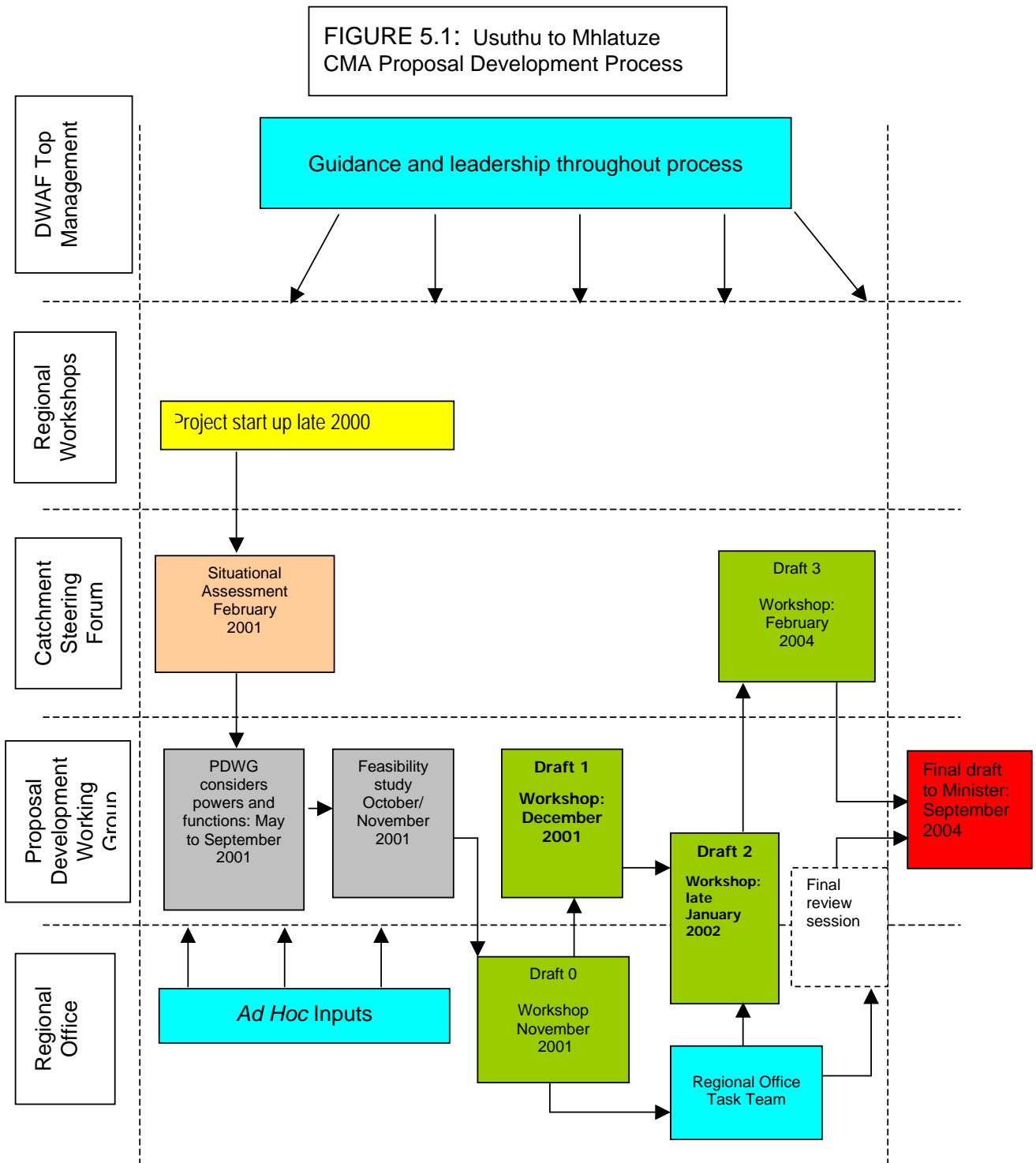
5.6 PROPOSED PHASING IN OF THE USUTHU TO MHLATUZE CMA

The phasing that will ultimately be implemented by the uSuthu to Mhlatuze CMA Governing Board (in terms of the National Water Act) will be beyond the influence of the PDWG and therefore this proposal does not contain any definitive statements on the programme for the establishment of operational and technical services (O&TS) arrangements. The CMA Governing Board will decide on the most appropriate programme for the phasing in of an O&TS in terms of its preferred O&TS scenario. However for the purposes of modelling the expected finances of the CMA it has been assumed that a two phase approach will be adopted with minimal staffing for the first five years as the CMA gets established.

The first tasks of the CMA Governing Board after its establishment will include:

- ❑ Development of a business plan.
- ❑ Establishment of a broad O&TS framework that can be implemented over an agreed time period.
- ❑ Initial negotiations with DWAF regarding possible secondment and transfer of DWAF staff to the uSuthu CMA.
- ❑ Development of human resources policies, outsourcing policies and job/task descriptions for the job/task categories appropriate to the first phase of the broad O&TS framework. The job description of a CEO is likely to be undertaken first.

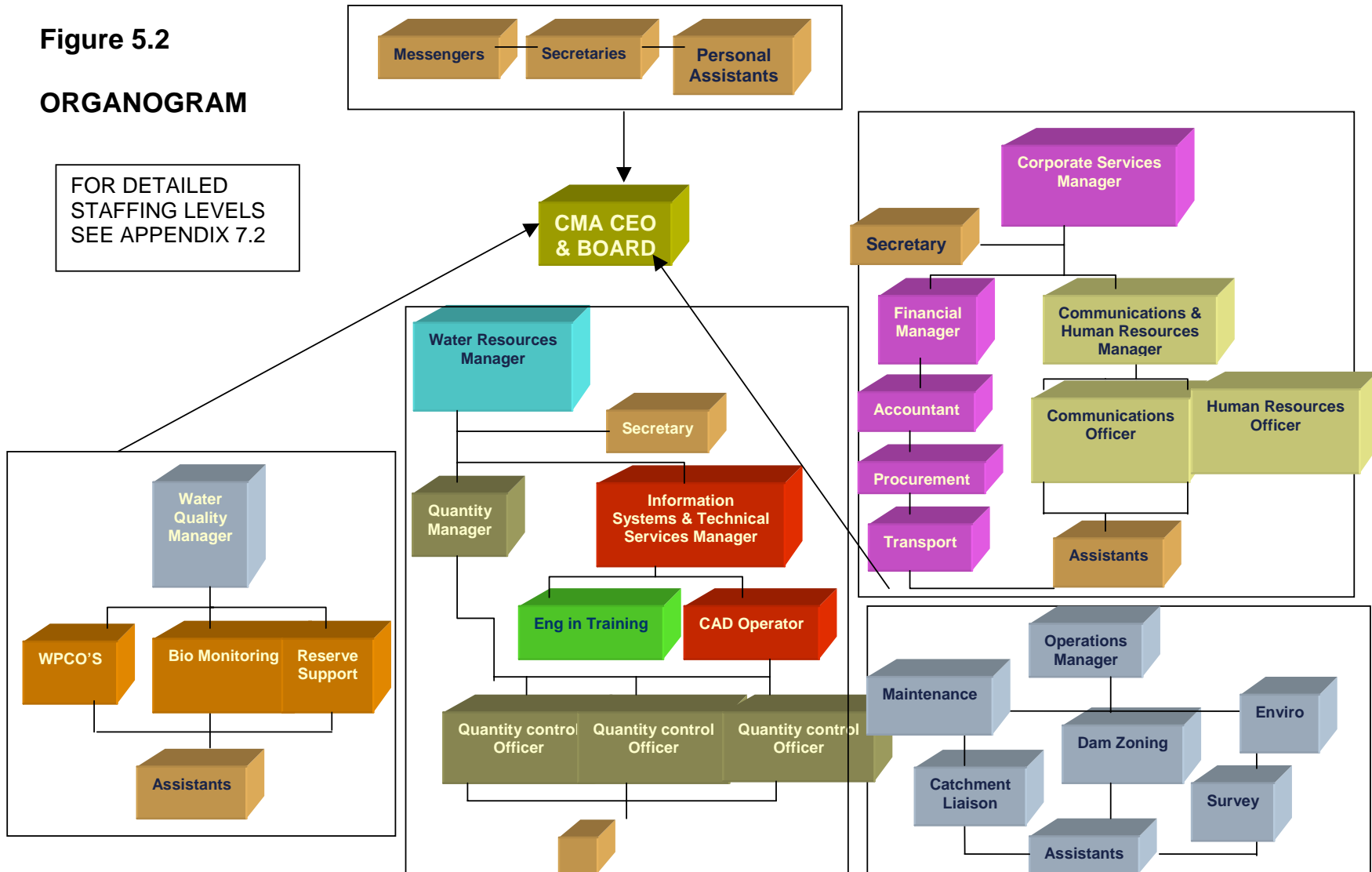
- Formalisation of the status of CMCs and the establishment of a range of support committees



The proposed phasing in of the uSuthu to Mhlatuze CMA, commencing with the appointment of the CMA Governing Board has been modelled based on an initial personnel complement of 19 persons, rising to 35 in the fifth year and to 90 in the tenth year. Detailed staffing structures are indicated in Figure 5.2, overleaf and detailed numbers in Appendix 7.3.

Figure 5.2
ORGANOGRAM

FOR DETAILED STAFFING LEVELS SEE APPENDIX 7.2



ASSESSMENT OF THE FINANCIAL FEASIBILITY RELATED TO THE ESTABLISHMENT OF A CATCHMENT MANAGEMENT AGENCY FOR THE USUTHU TO MHLATUZE WATER MANAGEMENT AREA

6. CMA COSTS

Basic assumptions relating to CMA costs are summarised below:

- 1) DWAF seed funding totalling R6m for the first 3 years.
- 2) Motor vehicles allowances for managers are included in salary packages
- 3) Purchase of a head office building and four regional office buildings costing a total of R13.5m. In line with standard accounting practice this investment is not depreciated.
- 4) Fixed overheads drop in year base + 3 due to purchase of building.
- 5) Equipment for approximately 30 automated water measuring points will need to be replaced every year at a cost of R1m.
- 6) No revenue from discharge levies before year base + 4.
- 7) No loan funding is assumed to be required other than occasional bank overdraft facilities to meet temporary cash flow needs.
- 8) IT costs assume replacement every three years
- 9) GIS data capture costs assume recapture every five years
- 10) Reserve determination is the subject of an exhaustive current study and therefore cost projections are modest.
- 11) River sampling costs are based on an assumed outsourcing of this function
- 12) Dam operating costs do not include any major capital, renewals nor dam safety works nor interest and redemption payments. Dam maintenance is assumed to be outsourced.
- 13) Hydrology network costs includes ongoing expansion of network
- 14) Water resource analysis costs include systems analysis and hydrological modelling (also interaction with compulsory licensing process).
- 15) Water quality analysis costs are based on current costs but allowing for 20% increase (over 2 years) to improve overall quality of monitoring and information gathering. River sampling cost is based on outsourcing
- 16) Interim management secondments (temporary) will be funded out of the remuneration budget
- 17) Pre base year costs are not modelled and are assumed to be the responsibility of DWAF

TABLE 6.1

SUMMARY OF MAJOR COST ELEMENTS IN THE USUTHU TO MHLATUZE CMA FIRST YEAR BUDGET

COST ELEMENT	AMOUNT BUDGETED Rm/year	% OF TOTAL BUDGET
Remuneration – CEO & Board	0.964	7.0%
Remuneration – Resource Management	1.500	10.9%
Remuneration – Quality Management	1.000	7.3%
Remuneration – Operations	0.940	6.8%
Remuneration – Corporate Services	1.200	8.7%
GIS Data Capture	0.800	5.8%
Water Quality Analysis	0.200	1.5%
Fixed Overheads	1.500	10.9%
Travel & Subsistence	0.500	3.6%
Printing & Photocopies	0.100	0.7%
Communication	0.300	2.2%
Consultants	0.700	5.1%
Sundry & Contingency	0.100	0.7%
Interest & Finance Costs	0.100	0.7%
Depreciation	0.730	5.2%
Total Budgeted Expenditure Per Year: (Programmes Excluded)	10.634	77.4%
Working for Water	0.200	1.5%
Catchment Management Strategy	0.500	3.6%
Reserve Determinations	0.200	1.5%
River Sampling	1.000	7.3%
Monitoring Sampling & Analysis	0.200	1.5%
Water Resources Analysis	0.500	3.6%
Institutional Support (incl. Fora)	0.500	3.6%
Total Budgeted Expenditure Per Year: (Programmes Included)	13.734	22.6%

Note: 14% VAT included where appropriate

7. FUNDING THE USUTHU TO MHLATUZE CMA

TABLE 7.1: EXAMPLE OF POSSIBLE ANNUAL SECTORAL CHARGES SUPPLIED BY DWAF

	SECTOR			
	Total registered water use 1400m x 10 ^{6m3}			
Catchment Management Activity Total Budget R10,0 x 10 ⁶	Municipal water use 100x10 ^{6m3}	Industrial water use 145x10 ^{6m3}	Irrigation water use 680x10 ^{6m3}	Forestry water use 475x10 ^{6m3}
Catchment Management Strategy Budget R1,5 x 10 ⁶	0,11 ^c /m ³	0,11 ^c /m ³	0,11 ^c /m ³	0,11 ^c /m ³
Dam Safety Budget R0,2 x 10 ⁶	0,02 ^c /m ³	0,02 ^c /m ³	0,02 ^c /m ³	Not allocated
Water Quality Management Budget R2,5 x 10 ⁶	0,18 ^c /m ³	0,18 ^c /m ³	0,18 ^c /m ³	0,18 ^c /m ³
Water Utilisation Budget R2,5 x 10 ⁶	0,18 ^c /m ³	0,18 ^c /m ³	0,18 ^c /m ³	0,18 ^c /m ³
Water Conservation				
* Demand Management Budget R0,3 x 10 ⁶	0,02 ^c /m ³	0,02 ^c /m ³	0,02 ^c /m ³	0,02 ^c /m ³
* Working for water (WFW) Budget R3,0 x 10 ⁶	0,32 ^c /m ³	0,32 ^c /m ³	0,32 ^c /m ³	0,32 ^c /m ³
Sectoral charge	0,83 ^c /m ³	0,83 ^c /m ³	0,54 ^c /m ³	0,49 ^c /m ³
Revenue	R830 000	R1 204 000	R3 670 000	R2 238 000

* WFW subsidized by 90% for Irrigation Sector

Funds can practically be generated no earlier than April 2003 with substantial income for the CMA generated no earlier than October 2003.

The Water Resource Management Charge could be phased in over a period, resulting in increasing levels of charges, or, as an alternative, can be collected to cover the full budgeted amount from the beginning. DWAF has indicated that the Water Resource Management Charge will be used by it to recover its costs in providing catchment management (or O&TS) services in the Usuthu to Mhlatuze Water Management Area, which means that the full amount will have to be charged from the outset.

The underlying water use assumptions and related tariff levels are summarised in appendix 7.

The funding of the CMA will be finalised and refined by DWAF and the Governing Board in consultation with the CMCs soon after establishment of the Usuthu to Mhlatuze CMA. It is assumed that DWAF will cover the costs associated with the CMA should registration of water use not be completed in time for charges to be sent out in April 2003.

7.1 FUNDING OF THE CMA: PRE ESTABLISHMENT PHASE

All costs to be borne by DWAF.

7.2 FUNDING OF THE CMA: ESTABLISHMENT PHASE

It is clear that the Usuthu to Mhlatuze CMA will require financial assistance from DWAF during its establishment phase. This proposal is based on the National Pricing Strategy and DWAF's current position on the use of funds appropriated by Parliament. In general, water users recognise that by forming a CMA they can, ultimately, control water resource management costs and, with that, water resource management charges.

It is anticipated that the CMA will have an income from Water Resource Management Charges no earlier than October 2003. Financial support from DWAF will therefore be required to cover the recruitment, salary and office costs of any O&TS staff who may be appointed prior to October 2003 (or the date of receipt of first income), as well as costs associated with meetings of the CMCs and the CMA Governing Board.

In addition to bridging financial and logistical support to a fledging Usuthu to Mhlatuze CMA, DWAF will need to budget for the following to allow the former to undertake its works as required in terms of the Act:

- Provision to the CMA of up-to-date information on the water resources of the Usuthu to Mhlatuze Water Management Area, including information on the following:
 - Hydrology
 - Yield calculations
 - Registered water use
 - Reserve estimates
 - Water quality
- Establishment of a geographic information management system (GIS) for easy access and manipulation of data for planning, monitoring and, ultimately, direct management purposes.
- Development of the CMA Proposal.
- Support during the first round of planning by the new Usuthu to Mhlatuze CMA.
- On-going subsidisation of the Working for Water Programme, as described in the National Pricing Strategy, for the next five years.
- Subsidisation of the water resource management charges to emerging farmers, to the irrigation sector and to the forestry sector.

An initial estimate of the potential cost of performing the above indicates that DWAF may have to make a budget allowance of approximately R37 million over the first five years.

7.3 FINANCIAL FEASIBILITY

The current charges and taxes paid by water consumers vary according to the type of consumer, whether a consumer receives its water from a Government Water Scheme (GWS), and the extent to which water works loans need to be repaid by the consumer's bulk supplier. In the case of a domestic consumer in an urban area, the consumer's water rate may cover the following aspects:

- ❑ DWAF charges for water supplied via a government water scheme.
- ❑ Repayment of water works loans by the local authority.
- ❑ Local authority administration, maintenance and running costs.
- ❑ Water Research levy.

An irrigator under an irrigation board (water user association - WUA) will pay water rates based on very similar aspects, with the local authority now being replaced by the irrigation board (WUA).

The proposed Catchment Management Charge for the use of raw water is intended to fund the work undertaken by the Usuthu to Mhlatuze CMA in undertaking its initial and delegated functions:

AGRICULTURE

It is anticipated that charges will be made according to the volume of water used. Information generated during the registration and licensing processes, preferably captured in a GIS, will be needed for the implementation of a system of differentiated charges.

FORESTRY

The forestry industry can differentiate between cultivars if it chooses, as long as the total revenue target is being met.

INDUSTRY AND DOMESTIC USERS

The charge will be levied on bulk suppliers in most cases who can cross-subsidise particular categories of user if they choose to.

ADDITIONAL CHARGES

Possible mechanisms for charging for evaporation from and filling of private dams need to be investigated. Tourism, possible discharge charges, and the use of water from boreholes are, at this stage, excluded from the charge calculations. If these charges are levied, they could reduce the Water Resource Management Charges for other users. These scenarios will be incorporated into the financial model business plan once more information becomes available.

In future, local authorities may be required to pay a fee for borehole usage (at the very least, they will be required to obtain permission for groundwater extraction).

The following are important exclusions from the Catchment Management Agency expenditure budget:

GIS System

One of the most important tools for effective catchment management, namely accurate and readily available date of owners, water use, status of the river etc. are still lacking. It is our firm belief that such information can only be made available from a proper and active GIS. This is an expensive exercise and the product is not available yet.

The cost budget does not make provisions for the setting up of such a system. However, it makes provision for the maintenance and updating of the system from time to time once it has been established (establishment includes updating of the existing information). It is assumed that DWAF will provide such a system to the CMA to maintain, or provide the funds to the CMA to establish such a system itself.

The establishment of a GIS system is therefore excluded in the cost budget.

Existing Water Users

It has been assumed that the proposed CMA will be provided with such an information system on water licences and registered water use, and that the CMA would take responsibility for using and maintaining this system.

Initial Reserve Determination

The cost to do the first Reserve Determination has also been excluded from the CMA costs. Updating thereof, however, has been included in the cost estimate.

The proposed Catchment Management Charge represents only a small portion of the cost structure of water users. If this charge was the only water charge to pay, one would have no hesitation in stating that the Usuthu to Mhlatuze CMA is feasible and good value for money in terms of providing water users with a system of which they can take ownership. However, there is concern about the impact of additional, not yet finalised, cost elements on water users and their running concerns.

It is clear that the Usuthu to Mhlatuze Water Management Area with its intensive development and rich natural resources deserves and needs a one-stop service which will promote optimal, but sustainable, water resource development. Establishment of a viable concern that will be able to meet the requirements of the National Water Act, 1998 (Act No. 36 of 1998) is demonstrated in this study. Such a concern will provide water users with the ideal vehicle for continuous improvement of service delivery and refinement of cost and finance arrangements.

8. CAPACITY OF THE PROPOSED CMA TO MEET OBLIGATIONS

A number of categories of expertise which will be very useful to the Usuthu to Mhlatuze CMA can be found locally or in nearby water management areas. These include:

- Engineering expertise
- Legal expertise
- Expertise in the management of water distribution
- Expertise in the management of ecosystems
- Expertise in the integrated water resource management

Water users and interest groups are fairly well organised in the Usuthu to Mhlatuze Water Management Area, and are currently organising for the establishment of prototype CMCs and Water User Associations.

An indicative list of available expertise is to be found in appendix 4.

9. SUMMARY OF FINDINGS

9.1 STRATEGIES AND POLICIES TO BE ADOPTED

A pragmatic staged approach to the establishment of the Usuthu to Mhlatuze CMA has been assumed. This will minimise or delay establishment costs whilst taking full advantage of existing capacity in the WMA to support the CMA in its designated functional areas.

9.2 COSTING OF CMA FUNCTIONS & SERVICES

An indication of the size of the CMA is given by the personnel complement that is projected to grow to 90 (excluding board members) by the tenth year of operation.

A very large proportion of the costs of operation of the CMA will be personnel related – projected at between 42% and 62% for the ten-year study period. Focus in this study has therefore been on determining realistic manning levels for the functions planned to be performed on a pragmatic phased basis of introduction over a seven-year period. The resulting cost estimates are realistic and of a sufficiently flexible nature (that is, they will be driven essentially by the process of personnel recruitment) as to be adjusted to the cash flow reality of the CMA as it develops.

9.3 SERVICE PRICING ASSUMPTIONS

Pricing is an insignificant factor except in relation to those users such as forestry plantations that have not previously paid directly for water.

9.4 FINANCIAL STRATEGIES

Setting of charges is assumed to be on a basis of aggregate cost recovery taking account of what the market will bear. In this context here is a need for sectoral division between broadly the urban and agricultural water uses and within specific sectors and this has been taken account of in the financial modelling. In view of the strong cash flow characteristics of the Usuthu to Mhlatuze CMA no borrowing for capital expenditure is planned. Occasional use of overdraft facilities to meet temporary cash flow fluctuations may be necessary. Investment in a suitable building is assumed to minimise rental costs. Motor vehicles are assumed to be purchased for cash and replaced on a five-year cycle. Water monitoring equipment is also assumed to be purchased for cash on a three-year

replacement cycle.

9.5 FORECAST OF REVENUE AND EXPENDITURE

Based on this approach the Usuthu to Mhlatuze CMA is viable. DWAF seed funding of around R6 million will however be required during the first three years. Full details are provided in Appendix 7.3.

9.6 ECONOMIC IMPLICATIONS

The impact of increased control associated with registration, licensing, operations and the legal enforcement of water use will have significant long term benefits in terms of encouraging rational and sustainable use of the water resources of the WMA. No significant negative economic impacts are anticipated.

APPENDIX 1

REFERENCES

- Adrian Wilson and Associates International: *uSuthu to Mhlatuze Water Management Area Situational Analysis Report*. Unpublished report (2000). DWAF KwaZulu-Natal Regional Office.
- Department of Water Affairs and Forestry, *Criteria for the Evaluation of a Proposal for the Establishment of a Catchment Management Agency* (2000)
- Department of Water Affairs and Forestry, *Establishing a Catchment Management Agency* (1999)
- Department of Water Affairs and Forestry, *Establishing a Water User Association* (1999)
- Department of Water Affairs and Forestry, *National Microbial* (1999)
- Department of Water Affairs and Forestry, *Proposal for the Establishment of a Catchment Management Agency for the Inkomati Basin: Final Draft* (2000)
- Department of Water Affairs and Forestry, *Public Participation for CMA's and WUA's* (1999)
- Department of Water Affairs and Forestry, *South African Water Quality Guidelines (second edition). Volume 1: Domestic Use* (1996)
- Department of Water Affairs and Forestry, *South African Water Quality Guidelines (second edition). Volume 4: Agricultural Water Use* (1996)
- Department of Water Affairs and Forestry, *South African Water Quality Guidelines (second edition). Volume 7: Aquatic Ecosystems* (1996)
- Department of Water Affairs and Forestry, *Water quality monitoring programme data and information* (2000)
- Department of Water Affairs and Forestry, Policy *Framework on the Financial Arrangements of Catchment Management Agencies" – Discussion Paper Version 3.0* (2003)
- Drennan, Maud and Partners, Groundwater Consulting Services, E. Martinelli and Associates, VSA Earth Science Consultants, *KwaZulu-Natal Groundwater Characterisation and Mapping Project* (1995)
- Government of South Africa, *National Water Act* (1998)
- Government of South Africa, *Water Services Act* (1997)
- KwaZulu-Natal Department of Traditional and Environmental Affairs, *Preliminary State of the Environment Report for KwaZulu-Natal* (1998)
- KwaZulu-Natal Provincial Cabinet, *The Provincial Growth and Development Strategy* (1996)
- MBB Consulting Engineers, *Riparian Zone Alien Vegetation Studies* (1998)
- Rothwell, A.F: *The role of indigenous knowledge in sustainable development:-A case study of medicinal plant use in the Upper Usuthu to Mhlatuze Valley* (1999). Unpublished Masters thesis. University of Natal
- Muller, Graham *et al*, *Initial Scan of Issues to be Addressed in Establishing Catchment Management Agencies*, CSIR (1999)
- Statistics South Africa, *Census* (1996)
- WRC Project K5/824/01, *Monitoring Implementation Manual. Final Report*.

APPENDIX 2

FUNCTIONS OF A CMA

1. Investigate and determine the extent to which any of its powers, duties or functions are currently being carried out by any body or institution within its Water Management Area (WMA) and the desirability of delegating the continued performance of such powers, duties or functions to such body or institution upon such conditions as it may negotiate and deem fit.
2. As to the protection, use, development, conservation, management and control of the water resources in its WMA and subject to the provisions of its (CMS) Catchment Management Strategy.
 - a. investigate and advise interested persons thereon.
 - b. Investigate and determine the steps to be taken to secure the protection, development and conservation of the water resources in its WMA and thereafter arrange for the implementation of such steps in accordance with the degree of priority and the costs attached to each step.
 - c. Investigate, record and monitor the use of the water resources in its WMA with a view to redressing the results of past racial and gender discrimination and achieving equitable access for all to such water resources.
 - d. Manage and control the water resources of its WMA with a view to achieving sustainability in both the quantity and the quality of such water resources.
3. Develop a Catchment Management Strategy (CMS) consonant with the National Water Resource Strategy and the relevant provisions of section 6(1) of the Act which CMS shall provide a broad framework within which Catchment Management Plans (CMP) may be drawn up for each of the catchments in its WMA.
4. Manage and control its income and expenditure with such care and efficiency as to ensure that its funds are not overspent yet its functions, powers and duties are exercised effectively.
5. Co-ordinate the related activities of water users and of water management institutions within its WMA with a view to achieving efficiency and efficacy in the conduct of such activities and avoiding duplication or undue overlapping of services.
6. Co-ordinate the implementation of its CMS and its CMPs with the implementation of any applicable development plan in terms of the Water Services Act (Act 108 of 1997).
7. Promote community and sectoral participation in the exercise of its functions and raise the level of public awareness concerning the importance of the work of the CMA.
8. Develop procedures for co-operative governance with all relevant institutions and national, provincial and local government in respect of all issues bearing on water resource quality and quantity including agricultural and developmental Land use practices and land use planning, pollution control, environmental and ecological factors, health, education and community participation.
9. Accept and receive the delegation or assignment of powers and duties and, subject to the conditions imposed by the Minister or the Director General (including those set out in Schedule 3 to the Act) and subject to the conditions imposed by the Minister, exercise those powers and duties.
10. Draw up CMPs, in terms of its CMS for each catchment in its WMA. In consultation with the communities resident in and the bodies or institutions associated with each such catchment provided that such plans shall be drawn up sequentially in accordance with the degree of urgency or priority for the need for the performance of any of its functions, powers or duties in any specific catchment.
11. Exercise such of the powers and duties set out in Schedule 3 to the Act as may be assigned or delegated to it by the Minister (annexure 3).
12. Exercise such of the powers and duties of a responsible authority set out in Chapter 4 of the Act as may be assigned or delegated to it by the Minister (including the authorisation, licensing and allocation of water use in its WMA).
13. Establish and collect Water Use Charges.
14. Where necessary and desirable develop and operate waterworks.
15. Determine and maintain the required standards for the quality of the water resources in its WMA and maintain the quantity of the Reserve in each of the catchments in its WMA.
16. Audit and monitor regularly all its catchment management activities and the performance of its powers, duties and functions in its WMA.
17. Enforce compliance with the provisions of any law, regulation, rule or directive relating to the protection, use, development, conservation, management or control of the water resources in its WMA (including pollution) by such means as may be deemed appropriate through either its own personnel or any outside agency qualified and equipped to do so or any due process of the law.
18. Draw up contingency plans for the management of the risks of floods, droughts and any other disasters affecting any of the water resources in its WMA.

APPENDIX 3

SUPPORTING STRATEGIES FOR THE PROTECTION, USE, DEVELOPMENT, CONSERVATION, MANAGEMENT AND CONTROL OF WATER RESOURCES

Functions (s80)	Strategies (Ref: Development of a generic framework for a catchment management strategy, final draft, June, 2000)
Protection	<ul style="list-style-type: none"> o Establish Resource Directed Measures and Source Directed Controls. o Develop procedures for co-operative governance on hazardous spills, import and disposal of hazardous waste. o Influence land use planning decisions that could lead to unacceptable impacts on WR. o Devise economic incentives for reduction in pollution. o Establish links with relevant authority evaluating Environmental Management and Implementation plans. o Establish water quality strategy for point and non point sources.
Use	<ul style="list-style-type: none"> o Establish net water surplus (or deficit) from NWRS and highlight stressed parts of WMA. o Establish criteria for evaluating current lawful usage. o Establish principles for general authorisations. o Establish water (use) allocation principles and water allocation plans taking account of s23, s27(1) and corrective action. o Review allocations at regular intervals. o Decide whether individual or compulsory license applications must be called for. o Develop strategy for trading water rights. o Develop strategy for upliftment programmes regarding the productive use of water. o Review merits/options regarding imported water (if any)
Development	<ul style="list-style-type: none"> o Investigate efficiency and financial viability of existing schemes. o Devise new approach and criteria to review and evaluate new development proposals so that they are streamlined (one stop shop), compatible with new policy and take account of impact on environment and local communities. o Develop new internal (DWAF) environmental policy (to co-ordinate with DEAT). o Establish links with land use related development initiatives (eg LDOs, SDIs). o Assess potential for transfers to other catchments and develop criteria for assessing merits thereof.
Conservation	<ul style="list-style-type: none"> o Devise new approaches to WM in each sector (considering efficiency, effective use and demand management). o Develop systematic approach to resource conservation. o Devise intervention framework (institutional) for each sector by which to guide water related activities towards optimum, sustainable use and resource conservation. o Develop flexible incentives to encourage change. Prepare Water Pricing policy to support Conservation objectives. o Prepare new water conservation policy for each sector, including regulations to ensure long term water security. o Devise (communication) programmes to promote better utilisation, whilst also providing comparative information for user sectors. o Structure management programmes for each user sector.
Management	<ul style="list-style-type: none"> o Compile register of all water related institutions in WMA. o Engage in consultative process to identify key issues and corresponding management goals. o Establish CMCs in response to relevant key issue identification. o Establish communication links with DWAF, provincial and local government organisations. o Devise strategy to facilitate/promote efforts of existing forums. o Establish and implement appropriate water pricing strategy
Control	<ul style="list-style-type: none"> o Determine acceptable levels of risk for floods, droughts, and other hazards, and establish appropriate (pro-active and pre-emptive) public safety and disaster prevention policy. o Establish suitable assessment, monitoring and auditing programme o Establish co-ordinated disaster management system. o Design and implement ongoing monitoring & assessment to enhance ability to manage and protect WR.

APPENDIX 4

EXISTING CAPACITY AND AN AUDIT OF DIFFERENT FUNCTIONS CONDUCTED BY THE RESPECTIVE INSTITUTIONS WITHIN THE USUTHU TO MHLATUZE WMA:

NAME	FUNCTION
DURBAN METRO	<p>Pollution control</p> <ul style="list-style-type: none"> ○ Leachate monitoring ○ Waste water monitoring ○ Oil/hydrocarbon removal ○ Litter control ○ Rainfall monitoring ○ Education ○ Stream flow monitoring <p>Quantity</p> <ul style="list-style-type: none"> ○ Land use/town planning ○ Erosion control ○ Catchment analysis ○ Storm water control ○ River systems maintenance
DWAF	<p>Dam management</p> <ul style="list-style-type: none"> ○ Dam safety ○ Dam scheduling ○ Control of large state dams ○ Survey siting ○ Hydraulic functions ○ Drilling and mechanical ○ Monitoring <p>Abstraction management</p> <ul style="list-style-type: none"> ○ Abstraction control ○ Registration of water use <p>Pollution control</p> <ul style="list-style-type: none"> ○ Water pollution control, industries and local authorities ○ Evaluation of water discharges (waste water) applications ○ Marine pipeline ○ Solid waste sites ○ EMPRs for mines/quarries ○ Water sampling ○ Biomonitoring <p>Community</p> <ul style="list-style-type: none"> ○ Representation of Catchment For a ○ Liaison with national, provincial and local authorities <p>Ground water management</p> <ul style="list-style-type: none"> ○ Geophysical field surveying ○ Gathering of borehole data ○ Ground water quality ○ Logging of ground water levels ○ Identification of likely drilling sites ○ Pumping tests on boreholes

	<ul style="list-style-type: none"> ○ Building capacity and creating awareness on ground water for schools, local authorities and the general public <p>Forestry Regulation (Water Use Management)</p> <ul style="list-style-type: none"> ○ Afforestation permit system ○ Conducting of proposed afforestation hydrological impact assessment ○ Afforestation site inspections ○ Investigations of unlawful afforestation and water abstraction <p>Information Technology</p> <ul style="list-style-type: none"> ○ Network control ○ GIS
<p>UMGENI WATER & MHALTUZE WATER</p>	<p>Hydrological</p> <ul style="list-style-type: none"> ○ Hydrological modelling. ○ Flood management planning. <p>Hydrogeological</p> <ul style="list-style-type: none"> ○ Groundwater potential evaluation and modelling ○ Geophysical investigations <p>Environmental</p> <ul style="list-style-type: none"> ○ Environmental scoping, EIAs, EMSs, EMS and procedures ○ Social Impact Assessments ○ Alien plants control ○ Environmental monitoring and auditing compliance ○ Sludge disposal systems <p>Water Engineering</p> <ul style="list-style-type: none"> ○ Infrastructure feasibility studies ○ Dam design <p>Water Resources Planning and Management</p> <ul style="list-style-type: none"> ○ Water resources assessments and allocation planning ○ Water resources systems modelling and yield analyses ○ Integrated water resources management planning, development and implementation <p>Water Conservation and Demand Management</p> <ul style="list-style-type: none"> ○ Water demand forecasting ○ Environmental reserve determination ○ Water conservation and demand management planning <p>Data Management</p> <ul style="list-style-type: none"> ○ Data capture, storage, maintenance and dissemination; water quality and quantity <p>Education and Capacity building</p> <ul style="list-style-type: none"> ○ Environmental awareness, water and sanitation ○ Training needs assessments, training and development of material and programmes ○ Public awareness programmes and campaigns ○ Internet and Intranet designs <p>Institutional Development</p> <ul style="list-style-type: none"> ○ Initiation, establishment and management of Catchment Fora ○ Institutional establishment; HR, finance and Administration, procurement, staff recruitment ○ Pollution Prevention and Control ○ Industrial, agricultural and general land use pollution threat assessment. ○ Development of mitigation options for pollution prevention and control. ○ Detection and response to pollution incidents and cleanup action. ○ Handling of legal issues relating to water pollution. ○ Aquatic weed threat assessment and implementation of required controls. ○ Assessment of suitability of sanitation in relation to water resource pollution. ○ Pollution monitoring of rivers, storm water, sewer networks, detection of sewer leaks

	<p>and response to related pollution.</p> <p>Monitoring Programmes Planning, designing and implementing quality and quantity monitoring programmes:</p> <ul style="list-style-type: none"> ○ Water quality ○ Biota ○ Microbiology & health-risks ○ Aquatic weeds ○ Continuous flow measurement ○ Automatic sampling <p>Catchment assessments</p> <ul style="list-style-type: none"> ○ Assessment and prediction of land use-water quality effects. ○ Pollutant load assessments. ○ Eutrophication assessment, modelling and control programmes. ○ Assessment of In-stream Flow Requirements. ○ Assessment of limnological characteristics.
MSINSI HOLDINGS	<p>Land Management</p> <ul style="list-style-type: none"> ○ Land parcel's integrity ○ Soil, plant and animal management <p>Ecotourism</p> <ul style="list-style-type: none"> ○ Marketing, advertising and public relation ○ Recreational activities ○ Safety, health and environmental management <p>Wildlife Management</p> <ul style="list-style-type: none"> ○ Protected areas planning and management ○ Habitat assessment ○ Species manipulation
CSIR	Laboratory Services

APPENDIX 5

POWER & DUTIES OF A CMA

Initial 'Inherent' Functions;

A CMA has a number of inherent powers by virtue of establishment. A CMA is a body corporate and has the powers of a natural person of full capacity (s79(1)). This means that a CMA can carry out activities such as entering contracts for supplies and borrowing money.

A CMA can carry out a range of powers related to the planning and conduct of the routine administrative and institutional business of the CMA (Schedule 4). In addition, a CMA can impose charges, in terms of the Minister's pricing strategy for water use charges, to cover the cost of executing its functions.

Following establishment, a CMA will be expected to carry out a range of initial functions as shown below. These focus on planning, co-ordination and public participation.

1. Investigate and advise interested persons on, the protection, use, development, conservation, management and control of the water resources in its WMA,
2. Develop a Catchment Management Strategy,
3. Co-ordinate the related activities of water users and of water management institutions within its WMA,
4. Promote the co-ordination of the implementation of its Catchment Management Strategy with the implementation of any applicable development plan in terms of the Water Services Act (Act 108 of 1997),
5. Promote community participation in its functions.

Powers and Duties of a Responsible Authority;

The powers and duties of a responsible authority are set out in Chapter 4 of the Act and relate to the ability to authorise, licence and regulate water use. These are shown below;

1. Issue general authorisations and licenses in respect of water use subject to conditions,
2. Extend the license period under certain conditions,
3. Review licenses at periods stated in the license and make amendments to its conditions or renew it,
4. Waive the need for a license if the water use is authorised under another law,
5. Promote 'one stop shop' licensing,
6. Require license applications to provide security for license obligations,
7. Require registration of existing lawful water uses,
8. Require an existing water user to apply to verify its water use,
9. Undertake compulsory licensing where there is water stress,
10. Suspend or withdraw entitlements to use water,
11. Enforce license conditions.

Other powers and duties vested in the Minister which may be delegated to CMAs or which are excluded

The Minister may delegate to a CMA, and a range of other bodies, many of the other powers and duties vested in the Minister by the Act (s63(1)). This would include, for example, the power to oversee the activities of a WUA. However, the Minister may not delegate the power to make a regulation, to authorise a water management institution to expropriate, to appoint the governing board of a CMA, or to appoint a member of the Water Tribunal (s63(2)).

APPENDIX 6

WATER RESOURCE MANAGEMENT CHARGE DETERMINATION

WRM ACTIVITY	Cost Rx10 ³	SECTORAL UNIT COST IN C/M ³		
		Domestic/ Industrial V ₁ (10 ³ m ³)	Agriculture V ₂ (10 ³ m ³)	Forestry V ₃ (10 ³ m ³)
Planning & Implementation of CMS	C1	100 C1 V ₁ +V ₂ +V ₃	100 C1 V ₁ +V ₂ +V ₃	100 C1 V ₁ +V ₂ +V ₃
Dam Safety Control	C2	100 C2 V ₁ +V ₂ +V ₃	100 C2 V ₁ +V ₂ +V ₃	Nil
Pollution Control	C3	100 C3 V ₁ +V ₂ +V ₃	100 C3 V ₁ +V ₂ +V ₃	100 C3 V ₁ +V ₂ +V ₃
Solid Waste Control	C4	100 C4 V ₁ +V ₂ +V ₃	100 C4 V ₁ +V ₂ +V ₃	100 C4 V ₁ +V ₂ +V ₃
Pollution Control on Mines	C5	100 C5 V ₁ +V ₂ +V ₃	100 C5 V ₁ +V ₂ +V ₃	100 C5 V ₁ +V ₂ +V ₃
Water Allocation	C6	100 C6 V ₁ +V ₂ +V ₃	100 C6 V ₁ +V ₂ +V ₃	100 C6 V ₁ +V ₂ +V ₃
Water Use Control	C7	100 C7 V ₁ +V ₂ +V ₃	100 C7 V ₁ +V ₂ +V ₃	100 C7 V ₁ +V ₂ +V ₃
WFW	C8	100 C8 V ₁ +V ₂	100 C8 V ₁ +V ₂	Nil
20/20 Vision	C9	100 C9 V ₁ +V ₂ +V ₃	100 C9 V ₁ +V ₂ +V ₃	100 C9 V ₁ +V ₂ +V ₃
Water Weeds	C10	100 C10 V ₁ +V ₂ +V ₃	100 C10 V ₁ +V ₂ +V ₃	100 C10 V ₁ +V ₂ +V ₃
Demand Management	C11	100 C11 V ₁ +V ₂ +V ₃	100 C11 V ₁ +V ₂ +V ₃	100 C11 V ₁ +V ₂ +V ₃
Total Unit Cost				
Less Subsidies		Nil	90 C8 V ₁ +V ₂	Nil
SECTORAL CHARGE				
Plus Inter-basin Transfer Input Costs	C12	100 C12 * V ₁		
TOTAL SECTORAL CHARGE				

V1, V2, V3 - Sectoral volumes as per 3.5.4.3.1

C1 to C11 - Activity costs to be taken into account for pricing purposes as per 3.5.4.3.3


C12 - Inter-basin transfer input cost, determined as per 3.5.4.3.6.

* In this case it is assumed that only the Domestic/Industrial sector has growing demands and will benefit from the inter-basin transfer.

APPENDIX 7

FINANCIAL MODEL

SEE MS EXCEL FILE: uSuthuCMAmodelPFFA.xls

In printed copies of this report the above file should be printed out on three pages
 and should replace this page.

USUTHU TO MHLATUZE CATCHMENT MANAGEMENT AGENCY

PROPOSED FUNDING MODEL (YEAR 2001 COST LEVELS)



ASSUMPTIONS:

Population Growth *pa* Due to current uncertainty regarding population trends no growth is assumed.

Water Demand Growth *pa* Demand is assumed to be static for the ten year planning horizon

Notes:

Fields which may be entered or altered manually are indicated in red *italics*

Calculated fields are indicated in black

Base Year Data:	Water Use m ³ pa	Ha	Tariff / Ha ¹ Rands All Years	Tariff / m ³ Cents Base +0/+2	Tariff / m ³ Cents Base +3/+4	Tariff / m ³ Cents Base +5/+7	Tariff / m ³ Cents Base +8/+9
Irrigation	606000000	-	-	1	1	1	1
Forestry	322000000	450366	10	-	-	-	-
Bulk Non-urban Industrial							
- Abstraction	19000000	-	-	1.4	1.7	2.3	2.4
- Discharge ²	15200000	-	-	1.4	1.7	2.3	2.4
Urban (Households & Industrial)							
- Abstraction	233000000	-	-	1.4	1.7	2.3	2.4
- Discharge ²	139800000	-	-	1.4	1.7	2.3	2.4
Unallocated - 50 year drought scenario	0	-	-				

Note:
The per Ha charge for Forestry will ultimately be converted to a per cubic metre charge.

% Registration Efficiency:	YEAR:	Base + 0	Base + 1	Base + 2	Base + 3	Base + 4	Base + 5	Base + 6	Base + 7	Base + 8	Base + 9
Irrigation		75	77	80	82	84	86	88	90	92	94
Forestry		80	85	90	95	96	97	98	99	100	100
Domestic / Industrial / Mining / Energy											
- Abstraction		95	96	97	98	99	100	100	100	100	100
- Discharge		0	0	0	0	100	100	100	100	100	100
Unallocated Water		100	100	100	100	100	100	100	100	100	100

% Collection Efficiency:	YEAR:	Base + 0	Base + 1	Base + 2	Base + 3	Base + 4	Base + 5	Base + 6	Base + 7	Base + 8	Base + 9
Agriculture (incl. Irrigation)		30	40	55	60	65	70	75	80	81	82
Forestry		75	80	85	90	91	92	93	94	95	96
Domestic / Industrial / Mining / Energy											
- Abstraction		80	85	90	91	92	93	94	95	96	97
- Discharge		0	0	0	0	100	100	100	100	100	100
Unallocated Water		100	100	100	100	100	100	100	100	100	100

OTHER ASSUMPTIONS:

- DWAF subsidies are as spelt out in the water management charge pricing policy. There is therefore no under-development subsidy.
- Motor vehicles allowances for managers are included in salary packages.
- Purchase of a head office building and four regional office buildings costing a total of R13.5m in year base +2 to +9. In line with standard accounting practice this investment is not depreciated.
- Fixed overheads drop after year base + 3 due to purchase of own building.
- Equipment for approximately 33 automated water measuring points will need to be replaced every year at a cost of R1m.
- No revenue from discharge levies before year base + 3.
- No loan funding is assumed to be required other than occasional bank overdraft facilities to meet temporary cash flow needs.
- IT costs assume replacement every three years
- GIS data capture costs assume recapture every five years
- The level of the water management charge on raw water transfers out of the Thukela catchment are based on a % of CMA costs as advised by DWAF
- River sampling costs are based on an assumed outsourcing of this function
- Operating costs do not include any major capital, renewals or dam safety works nor interest and redemption payments.
- Hydrological sampling costs includes ongoing expansion of network (construction of small weirs and supply and installation of equipment). Assumes significant extension and improvement of system in years base +0, +1 and + 2 which will be funded via DWAF in those years.
- Water resource analysis costs include systems analysis and hydrological modeling (also interaction with compulsory licensing process).
- Water quality analysis costs are recoverable from DWAF in the form of a discharge levy subsidy until the promulgation of discharge levy regulations makes it possible (assumed in year base +3 for the CMA to collect this revenue.
- Interim management secondments (temporary) will be funded out of the remuneration budget
- Pre base year costs are not modelled and are assumed to be the responsibility of DWAF

USUTHU TO MHLATUZE CMA MANNING LEVELS

APPENDIX 7.2



Position	Year: Base +0	Cost	Base +1	Cost	Base +2	Cost	Base +3	Cost	Base +4	Cost	Base +5	Cost	Base +6	Cost	Base +7	Cost	Base +8	Cost	Base +9	Cost	
	Annual Cost of Employment Rm																				
Chairman	0.072	1	0.072	1	0.072	1	0.072	1	0.072	1	0.072	1	0.072	1	0.072	1	0.072	1	0.072	1	0.072
Directors	0.024	8	0.192	8	0.192	8	0.192	8	0.192	8	0.192	8	0.192	8	0.192	8	0.192	8	0.192	8	0.192
CEO	0.600	1	0.600	1	0.600	1	0.600	1	0.600	1	0.600	1	0.600	1	0.600	1	0.600	1	0.600	1	0.600
Personal Assistant	0.100	1	0.100	1	0.100	1	0.100	1	0.100	1	0.100	1	0.100	1	0.100	1	0.100	1	0.100	1	0.100
Senior Secretaries	0.090	0	0.000	0	0.000	0	0.000	1	0.090	1	0.090	1	0.090	2	0.180	2	0.180	3	0.270	4	0.360
Sub-total			0.964		0.964		0.964		1.054		1.054		1.054		1.144		1.144		1.234		1.324
Water Resource Manager	0.400	1	0.400	1	0.400	1	0.400	1	0.400	1	0.400	1	0.400	1	0.400	1	0.400	1	0.400	1	0.400
Hydro Manager	0.300	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300
Geo Hydro Manager	0.300	0	0.300	0	0.300	0	0.300	0	0.300	0	0.300	2	0.600	2	0.600	2	0.600	2	0.600	1	0.300
Engineers	0.300	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300	2	0.600	2	0.600	3	0.900	3	0.900	4	1.200
IT Staff	0.200	1	0.200	1	0.200	1	0.200	1	0.200	1	0.200	2	0.400	2	0.400	2	0.400	2	0.400	2	0.400
Licensing Officers	0.150	0	0.000	0	0.000	0	0.000	0	0.150	2	0.300	3	0.450	3	0.450	4	0.600	4	0.600	11	1.650
Registration Officers	0.075	0	0.000	0	0.000	0	0.000	0	0.075	2	0.150	3	0.225	4	0.300	5	0.375	6	0.450	6	0.450
Clerks	0.060	0	0.000	0	0.000	0	0.000	0	0.060	1	0.060	2	0.120	3	0.180	4	0.240	5	0.300	7	0.420
Sub-total			1.500		1.500		1.500		1.500		1.785		2.870		3.155		3.590		3.875		5.120
Water Quality Manager	0.400	1	0.400	1	0.400	1	0.400	1	0.400	1	0.400	1	0.400	1	0.400	1	0.400	1	0.400	1	0.400
Biomonitoring Officers	0.300	1	0.300	1	0.300	1	0.300	1	0.300	2	0.600	1	0.300	1	0.300	2	0.600	2	0.600	1	0.300
Reserve Support Officers	0.300	0	0.300	0	0.300	0	0.300	0	0.300	1	0.300	2	0.600	3	0.900	3	0.900	4	1.200	1	0.300
WPCOs	0.150	0	0.000	0	0.000	0	0.000	0	0.150	2	0.300	3	0.450	3	0.450	4	0.600	5	0.750	5	0.750
Clerk	0.060	1	0.060	1	0.060	1	0.060	1	0.060	1	0.060	1	0.060	1	0.060	1	0.060	1	0.060	1	0.060
Sub-total			1.000		1.000		1.000		1.000		1.450		1.600		2.050		2.350		2.800		1.750
Operations Manager	0.400	0	0.000	0	0.000	0	0.000	1	0.400	1	0.400	1	0.400	1	0.400	1	0.400	1	0.400	1	0.400
Catchment Liason Manager	0.300	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300
Mechanical Engineer	0.220	0	0.000	0	0.000	0	0.000	1	0.220	1	0.220	1	0.220	1	0.220	1	0.220	1	0.220	1	0.220
GIS / IT Manager	0.300	0	0.000	0	0.000	0	0.000	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300
Environmental Officer	0.300	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300
Dam Safety Officer	0.220	1	0.220	1	0.220	1	0.220	1	0.220	1	0.220	1	0.220	1	0.220	1	0.220	1	0.220	1	0.220
Liason Officers (Community Development)	0.200	0	0.000	0	0.000	0	0.000	1	0.200	1	0.200	1	0.200	2	0.400	2	0.400	2	0.400	2	0.400
GIS / CAD Staff	0.120	1	0.120	1	0.120	1	0.120	1	0.120	1	0.120	2	0.240	2	0.240	3	0.360	3	0.360	4	0.480
Technicians/Artisans	0.075	0	0.000	0	0.000	0	0.000	1	0.075	2	0.150	5	0.375	8	0.600	10	0.750	11	0.825	12	0.900
Assistants (Community Development)	0.060	0	0.000	0	0.000	0	0.000	1	0.060	1	0.060	2	0.120	2	0.120	2	0.120	2	0.120	2	0.120
Sub-total			0.940		0.940		0.940		2.195		2.270		2.675		3.100		3.370		3.445		3.640
Corporate Services Manager	0.400	1	0.400	1	0.400	1	0.400	1	0.400	1	0.400	1	0.400	1	0.400	1	0.400	1	0.400	1	0.400
Accountant	0.300	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300
Office Manager	0.200	0	0.000	0	0.000	0	0.000	0	0.200	0	0.200	1	0.200	1	0.200	1	0.200	1	0.200	1	0.200
Bookkeeper	0.200	0	0.000	1	0.200	1	0.200	1	0.200	1	0.200	1	0.200	1	0.200	1	0.200	1	0.200	1	0.200
Credit Controller	0.200	0	0.000	0	0.000	0	0.000	0	0.200	0	0.200	0	0.000	0	0.000	0	0.000	0	0.000	1	0.200
Paymaster	0.200	1	0.200	1	0.200	1	0.200	1	0.200	1	0.200	1	0.200	1	0.200	1	0.200	1	0.200	1	0.200
HR Manager	0.300	0	0.000	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300	1	0.300
Cashier	0.200	0	0.000	0	0.000	0	0.000	0	0.200	0	0.200	1	0.200	1	0.200	1	0.200	1	0.200	1	0.200
Communications Officer	0.200	1	0.200	1	0.200	1	0.200	1	0.200	1	0.200	1	0.200	1	0.200	1	0.200	1	0.200	1	0.200
Clerks (Reception, Accounts, Legal, HR, Filing)	0.060	1	0.060	1	0.060	1	0.060	1	0.060	1	0.060	2	0.120	4	0.240	4	0.240	5	0.300	5	0.300
Messenger / Cleaner	0.040	1	0.040	1	0.040	1	0.040	1	0.040	1	0.040	2	0.080	2	0.080	2	0.080	2	0.080	2	0.080
Sub-total			1.200		1.700		1.700		1.700		1.700		2.200		2.320		2.320		2.380		2.580
GRAND TOTAL		19	5.604	21	6.104	21	6.104	28	7.449	35	8.259	52	10.399	64	11.769	71	12.774	79	13.734	90	14.414
CAPITAL EXPENDITURE																					
Manager's / Professional's Cars	0		0		0		0		0		0		0		0		0		0		0
Other Vehicles	4		4		4		5		9		13		15		17		20		24		24
Vehicle Purchases	0.400		0.000		0.000		0.100		0.400		0.800		0.200		0.200		0.350		0.850		0.850
Water Metering Equipment	0.500		0.500		0.500		0.500		0.500		0.500		0.500		0.500		0.500		0.500		0.500
Building			2.500		2.500				3.000		3.000		3.500		3.000		1.000		0.500		0.500
Monitoring Network	1.250		1.250		1.250		1.250		1.250		1.250		1.250		1.250		1.250		1.250		1.250
Computers	1.000		0.700		0.500		0.500		0.500		0.500		0.500		0.500		1.000		1.000		1.000
Other Capital Expenditure	0.500		0.500		0.500		0.500		0.400		0.300		0.200		0.200		0.200		0.200		0.200
TOTAL		3.650		2.950		5.250		2.850		3.050		6.350		6.150		5.650		4.300		4.300	

uSuthu to Mhlatuze CMA Financial Model:

INCOME Rm	YEAR:	Base + 0	Base + 1	Base + 2	Base + 3	Base + 4	Base + 5	Base + 6	Base + 7	Base + 8	Base + 9
Sectoral Tariffs											
Agriculture (incl. Irrigation)		1.364	1.866	2.666	2.982	3.309	3.648	4.000	4.363	4.516	4.671
Forestry		2.702	3.062	3.445	3.851	3.934	4.019	4.105	4.191	4.278	4.324
Urban Households & Industry		0.675	0.690	0.706	0.761	1.026	1.229	1.234	1.238	1.276	1.280
Transfers Out											
Upper Vaal 162 million m ³ pa	6.24%	0.856	1.020	1.020	0.965	1.002	1.142	1.223	1.314	1.443	1.526
Transfers In											
Thukela 88 million m ³ pa	4.20%	-0.473	-0.473	-0.473	-0.473	-0.473	-0.473	-0.473	-0.473	-0.473	-0.473
Other											
DWAF Seed Funding		2.000	2.000	2.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DWAF Irrigation Subsidy		1.818	1.866	1.939	3.478	3.563	6.775	6.933	7.090	7.805	7.975
DWAF Forestry Subsidy		3.570	3.794	4.017	5.158	5.212	7.140	7.214	7.287	7.683	7.683
DWAF Underdevelopment Subsidy		0	0	0	0	0	0	0	0	0	0
DWAF Discharge Levy Subsidy		4.200	4.200	4.200	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DWAF Catchment Management Strategy		0.500	0.500	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL INCOME		17.212	18.526	20.020	16.721	17.573	23.481	24.234	25.011	26.528	26.986
EXPENDITURE Rm											
Programmes											
Working for Water		0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
Catchment Management Strategy		0.500	0.500	0.500	0.200	0.200	0.200	0.200	0.200	0.200	0.200
Reserve Determinations		0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
River Sampling		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.500	2.000	2.500
Monitoring Sampling & Analysis		0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
Water Resources Analysis		0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500
Institutional Support (incl. Fora)		0.500	1.500	2.000	0.500	0.200	0.200	0.200	0.200	0.200	0.200
Core Costs											
Remuneration - CEO & Board		0.964	0.964	0.964	1.054	1.054	1.054	1.144	1.144	1.234	1.324
Remuneration - Resource Management		1.500	1.500	1.500	1.500	1.785	2.870	3.155	3.590	3.875	5.120
Remuneration - Quality Management		1.000	1.000	1.000	1.000	1.450	1.600	2.050	2.350	2.800	1.750
Remuneration - Operations		0.940	0.940	0.940	2.195	2.270	2.675	3.100	3.370	3.445	3.640
Remuneration - Corporate Services		1.200	1.700	1.700	1.700	1.700	2.200	2.320	2.320	2.380	2.580
GIS Data Capture		0.800	0.800	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
Water Quality Analysis		0.200	0.220	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
Fixed Overheads		1.500	1.500	1.500	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Travel & Subsistence		0.500	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.500	1.500
Printing & Photocopies		0.100	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150
Communication		0.300	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500
Consultants		0.700	0.600	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500
Sundry & Contingency		0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
Interest & Finance Costs		0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
Depreciation		0.720	1.176	1.256	1.323	1.404	1.512	1.437	1.392	1.495	1.657
TOTAL EXPENDITURE		13.724	16.350	16.360	15.472	16.063	18.311	19.606	21.066	23.129	24.471
SURPLUS BEFORE CAPITAL EXP.		3.488	2.176	3.661	1.249	1.510	5.169	4.628	3.944	3.398	2.515
CAPITAL EXPENDITURE		3.650	2.950	5.250	2.850	3.050	6.350	6.150	5.650	4.300	4.300
CAPITAL EXP less DEPRECIATION		2.930	1.774	3.994	1.527	1.646	4.838	4.713	4.258	2.805	2.643
CUMULATIVE CASH FLOW		0.558	0.960	0.626	0.348	0.212	0.544	0.459	0.145	0.739	0.611
CAPITAL ASSETS BOOK VALUE		3.650	4.704	5.023	5.294	5.616	6.050	5.750	5.570	5.982	6.629
DEPRECIATION BASE		3.598	5.880	6.278	6.617	7.020	7.562	7.187	6.962	7.477	8.286
Total Personnel Costs		5.604	6.104	6.104	7.449	8.259	10.399	11.769	12.774	13.734	14.414
% of Total Core Costs		43%	42%	43%	50%	53%	58%	61%	62%	60%	60%

APPENDIX 7.

ASSUMPTIONS:

- DWAF subsidies are as spelt out in the water management charge pricing policy. There is therefore no under-development subsidy.
- Motor vehicles allowances for managers are included in salary packages.
- Purchase of a head office building and four regional office buildings costing a total of R13.5m in year base +2 to +9. In line with standard accounting practice this investment is not depreciated.
- Fixed overheads drop after year base + 3 due to purchase of own building.
- Equipment for approximately 33 automated water measuring points will need to be replaced every year at a cost of R1m.
- No revenue from discharge levies before year base + 3.
- No loan funding is assumed to be required other than occasional bank overdraft facilities to meet temporary cash flow needs.
- IT costs assume replacement every three years
- GIS data capture costs assume recapture every five years
- The level of the water management charge on raw water transfers out of the Thukela catchment are based on a % of CMA costs as advised by DWAF
- River sampling costs are based on an assumed outsourcing of this function
- Operating costs do not include any major capital, renewals or dam safety works nor interest and redemption payments.
- Hydrological sampling costs includes ongoing expansion of network (construction of small weirs and supply and installation of equipment). Assumes significant extension and improvement of system in years base +0, +1 and + 2 which will be funded via DWAF in those years.
- Water resource analysis costs include systems analysis and hydrological modeling (also interaction with compulsory licensing process).
- Water quality analysis costs are recoverable from DWAF in the form of a discharge levy subsidy until the promulgation of discharge levy regulations makes it possible (assumed in year base +3 for the CMA to collect this revenue).
- Interim management secondments (temporary) will be funded out of the remuneration budget
- Pre base year costs are not modelled and are assumed to be the responsibility of DWAF

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