

REPUBLIC OF SOUTH AFRICA

**DEPARTMENT OF
WATER AFFAIRS AND FORESTRY**

Proposed First Edition
**NATIONAL WATER RESOURCE
STRATEGY**

SUMMARY



August 2002



**PROPOSED FIRST EDITION
NATIONAL WATER RESOURCE STRATEGY**

SUMMARY

This document provides a Summary of the Proposed First Edition National Water Resource Strategy for comment by the public. The complete document is available for inspection at the following public places, including the offices of the Department of Water Affairs and Forestry.

EASTERN CAPE

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 DWAF Area Office: East London
 DWAF Regional Office: King Williams Town
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 DWAF Area Office: Umtata
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MPUMALANGA (continued)

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NORTHERN CAPE

Calvinia Hantam Municipality Offices
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 DWAF Regional Office: Kimberley
 DWAF Area Office: Upington
 Namaqua District Municipality Offices
 Northern Cape Agricultural Union, Upington
 Prieska Public Library
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NORTH-WEST

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Written comments on the Proposed Strategy should be submitted on or before 31st January 2003 to

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INTRODUCTION

RONNIE KASRILS, MP

MINISTER OF WATER AFFAIRS AND FORESTRY

Water gives life. It waters the fields of farmers; it nurtures the crops and stock of rural communities; it provides recreation for our children, our friends, our families; it supports our power generation, our mines, our industry, and the plants and animals that make up ecosystems. Water is the key to development and a good quality of life in South Africa. South Africa's water belongs to its people. It is the task of the South African Government to care for this water, to seek its fair distribution, and to facilitate its wise use for, amongst other things, social and economic development.

The National Water Act (No. 36 of 1998) specifies that the government, as the public trustee of the nation's water resources, must ensure that water is protected, used, developed, conserved, managed and controlled in an equitable and sustainable manner for the benefit of all people, and requires that the Department of Water Affairs and Forestry as custodian of South Africa's water resources, should provide a National Water Resource Strategy as a framework for the management of water resources in South Africa.

South Africa is a semi-arid country, with an average rainfall for the country of about 450 mm per year, well below the world average of about 860 mm per year. Our rivers are small in comparison with other countries. The Orange River carries only about 10% of the volume of water flowing annually down the Zambezi River, and about 1% of the flow in the Congo River. Furthermore, many of our larger rivers, such as the Orange/Senqu and the Limpopo, are shared with other countries. Eleven of the nineteen water management areas in the country are facing a water deficit, where the requirements for water exceed its availability.

Not all of our water is of good quality. Across the country, on a daily basis, organisations and individuals impact on the water quality in our rivers and streams, our groundwater and our wetlands. Major water quality problems in South Africa include high salt and nutrient loads, sediments caused by erosion, contamination by bacteria, acid waters and the presence of toxic substances. Other threats to the health of our rivers are over-utilisation of riparian zones; alien species of fauna and flora (terrestrial and aquatic); and regulation of flows and water abstraction.

Neither do rivers respect political boundaries. Many cross national boundaries (trans-boundary rivers) and some provide the boundary between countries (contiguous rivers). South Africa shares four major river systems with neighbouring countries:

- The Orange-Senqu system is shared with Lesotho (trans-boundary) and Namibia (contiguous).
- The Limpopo River is shared with Botswana and Zimbabwe (contiguous), and Mozambique (transboundary).
- The Inkomati system is shared with Swaziland and Mozambique (trans-boundary)
- The Usutu/Pongola-Maputo system is shared with Mozambique and Swaziland (trans-boundary).

The Protocol on Shared River Courses in the Southern African Development Community provides the framework for the management of these rivers, whilst the National Water Act gives international requirements a priority second only to the basic human needs and ecological Reserve.

But water management is not just about solving problems, it is also about creating opportunities. The Proposed First Edition National Water Resource Strategy, summarised in this document, sets out the ways in which we aim to achieve integrated water resources management in South Africa. It is the implementation strategy for the National Water Act and provides the legally-binding framework within which the water resources of South Africa will be managed in the future. It outlines the goals and objectives of water resources management for the country and provides the plans, guidelines and strategies to achieve these goals. It identifies opportunities for social and economic development where water is available, and the developments required to achieve them. It is a remarkable document, the first of its kind in South Africa. It is also a dynamic document, which will continue to grow and change as the needs, capacity and understanding of our people change.

CHAPTER 1 WATER POLICY, WATER LAW AND WATER RESOURCES MANAGEMENT

1.1 INTRODUCTION

The National Water Resource Strategy (NWRS) provides the implementation framework for the National Water Act, 1998 (No. 36 of 1998) (the Act, or NWA). The foundations of the National Water Resource Strategy are the National Water Policy (1997) and the National Water Act.

The Act requires the Minister of Water Affairs and Forestry (the Minister), as soon as reasonably practicable, to establish the National Water Resource Strategy by publishing a Notice in the Government Gazette. This document provides the summary of the First Edition National Water Resource Strategy (NWRS).

1.2 THE NATIONAL WATER RESOURCE STRATEGY

The NWRS has four main objectives:

- **To establish the national framework for managing water resources** - Section 5(3) of the Act states that South Africa's water resources must be protected, used, developed, conserved, managed and controlled in accordance with the NWRS. The NWRS is legally binding. It is intended to be an enduring description of the ways in which water resources will be managed, but may be amended to suit changing circumstances through a review process that must occur at least every five years, in consultation with stakeholders.
- **To establish the framework for the preparation of catchment management strategies** - A catchment management strategy is the framework for water resources management in a water management area. The NWRS provides a framework within which all catchment management strategies will be prepared and implemented in a nationally consistent way. A catchment management strategy may not be in conflict with the NWRS.
- **To provide information** - The Act requires that the Minister ensures that all aspects of water resources management, which will affect other Organs of State, water users and the public in general, are brought to their attention. In addition, the Strategy may be formally established only when the Minister is satisfied that everyone who wishes to comment has been afforded an opportunity to do so, that all comments have been carefully considered, and necessary changes have been made.
- **To identify development opportunities and constraints** - The NWRS also identifies areas of the country in which limited water resources are a constraint for development, as well as areas in which water resources are available to support social and economic development initiatives.

1.3 INTEGRATED WATER RESOURCES MANAGEMENT

The Act recognises that to achieve the objectives of sustainability, equity and efficiency, water resources need to be managed in an integrated manner. Integrated water resources management is an evolving, iterative process for the coordinated planning and management of water, land and environmental resources. It is based on the concept that different water resources (rivers, wetlands, reservoirs, groundwater) are linked by the hydrological cycle to each other, to the surrounding environment and to human activities that influence them.

The NWRS is based on integrated water resources management, taking into account the availability of surface and groundwater, water use, ground- and surface water quality, and environmental and social considerations. Surface and groundwater are viewed as an integrated whole, as are aspects of water quantity and quality. Special reference is made only in cases where different components need to be managed differently.

The Department of Water Affairs and Forestry (the Department) intends to establish catchment management agencies to manage water resources in an integrated manner at regional level. These agencies will be responsible for ensuring that there is consonance between their water-related plans and programmes, and the plans and programmes of all other role players in their areas. The agencies must establish cooperative relationships with a wide range of stakeholders, including other water management institutions, water services institutions, provincial and local government authorities, communities, water users ranging from large industries to individual irrigators, and other interested persons.

CHAPTER 2

SOUTH AFRICA'S WATER SITUATION, AND STRATEGIES TO BALANCE SUPPLY AND DEMAND

2.1 INTRODUCTION

South Africa is a semi-arid country in which the average rainfall is well below the world average of about 860 mm per year. As a result, South Africa's water resources are, in global terms, scarce and limited in extent. Groundwater plays a pivotal role for rural water supplies in the country, but few major groundwater aquifers exist that can be utilised on a large scale.

The natural availability of water across the country is also uneven and this is compounded by a strong seasonality of rainfall. Stream flow in South African rivers is at a relatively low level for most of the time, a feature which limits the proportion of stream flow that can be relied upon to be available for use. This variability also has implications for water-related disasters such as floods and droughts. Many urban and industrial developments, as well as some dense rural settlements, have been established in locations remote from large watercourses. As a result, the requirements for water already far exceed the natural availability of water in several river basins, and therefore large-scale transfers of water across catchments have been implemented.

Four of the main rivers in South Africa are shared with other countries. These are the Limpopo, Inkomati, Pongola (Maputo) and Orange (Senqu) rivers, which together drain about two-thirds of the land area and contribute a significant proportion of the country's total surface runoff (river flow). Approximately 70% of the gross domestic product (GDP) of South Africa and a similar percentage of the population of the country are supported by water supplied from these rivers, making their wise joint management, with the neighbouring countries, of paramount importance to South Africa.

In order to facilitate the management of water resources, the country has been divided into 19 catchment based water management areas (see Figure 3.1, page 21).

2.2 BROAD PERSPECTIVE ON WATER SITUATION

Water resource developments in South Africa have continuously evolved to meet the socio-economic needs of the country, within the constraints imposed by nature. This has been made possible by recognising water as a national asset, thereby allowing its transportation to areas where the greatest overall benefits for the nation can be achieved.

In general, there are sufficient water resource developments to ensure that all current requirements for water can reasonably be met, without impairing the socio-economic development of the country. There are, however, situations where people do not have access to a reliable source of potable water. This is largely due to a lack of infrastructure, and funding for its provision and operation. Redressing this situation is a priority for the Department and other relevant government institutions.

In order to meet the water requirements of South Africa, water resources are highly developed and utilised in most of the country. As a result of the many control structures (dams, weirs), abstractions of water, return flows to rivers, as well as the impacts of land use, the flow regime in many rivers has been significantly altered. The general expectation is that trends towards industrialisation of the economy and urbanisation of the population are likely to continue, which will further affect the country's rivers unless appropriate corrective measures are taken. The focus of the NWRS is on the sustainable use of the country's water resources.

Whilst attention in the past was mainly focused on the development of new resources, the efficiency of water use has not developed to the same level of sophistication. With the current high degree of water resource utilisation in the country, the efficiency of water use must be substantially improved. The Department is developing an extensive programme for water conservation and water demand management which forms an important element of the NWRS. In addition, measures are to be introduced to ensure the most beneficial utilisation of water in the country, both from a social and economic perspective. This will include the re-allocation of some water from low-benefit uses to higher benefit uses over time.

2.3 WATER RESOURCES

South Africa is dependent on surface water resources for most of the urban, industrial and irrigation water supplies in the country. Groundwater, while also extensively utilised, particularly in the rural and more arid areas, is limited due to the geology of the country. Large porous aquifers occur only in a few areas.

In the northern parts of the country, both surface and groundwater resources are nearly fully developed and utilised. Some over-exploitation occurs in localised areas, with little undeveloped resource potential remaining. The reverse applies to the well-watered south-eastern region of the country where there are still significant undeveloped and little-used resources.

The total surface water available in South Africa averages 49 200 million cubic metres (m³) per year (see Table 2.1), this includes about 4 800 million m³ per year of water originating from Lesotho, and approximately 700 million m³ per year originating from Swaziland (inflows from neighbouring countries into rivers bordering on South Africa are not included.). A portion of this needs to remain in the river to maintain the environmental (ecological) component of the Reserve, provisional estimates of which are given in Table 2.1. Only a portion of the remaining available water can practically and economically be harnessed as usable yield, and this is given in Table 2.2.

Table 2.1: Natural mean annual runoff and the ecological Reserve (million m³/a)

Water Management Area	Natural Mean Annual Runoff	Ecological Reserve
1 Limpopo	985	156
2 Luvuvhu/Letaba	1 185	224
3 Crocodile West and Marico	855	165
4 Olifants	2 042	460
5 Inkomati	3 539	1 008
6 Usutu to Mhlatuze	4 780	1 192
7 Thukela	3 799	859
8 Upper Vaal	2 423	299
9 Middle Vaal	888	109
10 Lower Vaal	368	48
11 Mvoti to Umzimkulu	4 798	1 160
12 Mzimvubu to Keiskamma	7 241	1 122
13 Upper Orange	6 981	1 349
14 Lower Orange	502	69
15 Fish to Tsitsikamma	2 154	243
16 Gouritz	1 679	325
17 Olifants/Doring	1 108	156
18 Breede	2 472	384
19 Berg	1 429	217
Total for Country	49 228	9 545

Substantial volumes of water from urban and industrial developments are returned to streams and are then available for re-use. Total usable return flows are close to double the current yield from groundwater (see Table 2.2). In Table 2.2, the negative yields from surface water in the Lower Vaal and Lower Orange water management areas (in brackets) reflect the fact that river losses due to evaporation and seepage are greater than the additional yield contributed by local runoff in these areas.

Estimates of the still-undeveloped resource potential show that the yield from surface water can be increased by about 5 600 million m³ per year (see Table 2.5, page 9). In addition, substantial quantities can be made available through the increased re-use of return flows, with specific potential at some coastal cities, where wastewater is discharged to the sea. Potential also exists for further groundwater development, although on a smaller scale.

Desalination of seawater offers particular opportunities for coastal users. Although expensive, the trend is that desalination will become more competitive as there are continued advances in technology. It is not foreseen that the

application of importation and other unconventional options (e.g. iceberg importation and cloud seeding) will be economically competitive in the near future.

Table 2.2: Available yield in year 2000 (million m³/a)

Water Management Area	Natural Resource		Usable Return Flow			Total Local Yield
	Surface Water	Ground -water	Irrigation	Urban	Mining and Bulk Industrial	
1 Limpopo	160	98	8	16	0	282
2 Luvuvhu/Letaba	243	44	19	4	0	310
3 Crocodile West and Marico	202	111	44	295	41	693
4 Olifants	409	99	44	45	14	611
5 Inkomati	857	9	58	8	11	943
6 Usutu to Mhlatuze	920	39	39	11	1	1 010
7 Thukela	666	15	23	25	9	738
8 Upper Vaal	1 173	32	11	361	146	1 723
9 Middle Vaal	83	54	16	30	18	201
10 Lower Vaal	(135)	126	52	5	2	50
11 Mvoti to Umzimkulu	433	6	21	61	6	527
12 Mzimvubu to Keiskamma	777	21	17	40	0	855
13 Upper Orange	4 420	65	34	38	0	4 557
14 Lower Orange	(1 108)	24	76	1	0	(1 007)
15 Fish to Tsitsikamma	265	36	115	21	0	437
16 Gouritz	191	64	8	8	6	277
17 Olifants/Doring	266	45	22	2	0	335
18 Breede	687	109	54	18	0	868
19 Berg	419	45	11	26	0	501
Total for Country	10 928	1 042	672	1 015	254	13 911

2.4 WATER REQUIREMENTS

There is a large variation in water requirements across the country due to the different water use sectors and their requirements with respect to quantity, quality, distribution in time, and assurance of supply.

The water use sectors are:-

- Rural requirements, mainly representing domestic use and stock watering in rural areas;
- Urban requirements, which include all water used in urban areas such as domestic, industrial, offices, parks and communal;
- Mining and bulk users, with the latter essentially representing large industrial users outside urban areas;
- Power generation;
- Irrigation for agricultural production;
- Afforestation, as a formally declared stream flow reduction activity; and
- Transfers of water out of a particular area, which constitutes a requirement for water from that area. (Provision for basic human needs (human component of the Reserve) is included under rural and urban requirements).

Current Water Requirements

Estimated water requirements for the year 2000 are given in Table 2.3 for the different water use sectors, standardised to the equivalent quantities at a 98% assurance of supply (that is, in two years out of a hundred, some level of failure to supply will occur, where not all of the water needed will be available).

Table 2.3: Water requirements for year 2000 (million m³/a)

Water Management Area	Irrigation	Urban	Rural	Mining and Bulk Industrial	Power Generation	Afforestation	Total Local Requirements
1 Limpopo	238	37	28	14	7	1	325
2 Luvuvhu/Letaba	248	11	31	1	0	43	334
3 Crocodile West and Marico	445	691	38	127	27	0	1 328
4 Olifants	557	92	44	94	181	3	971
5 Inkomati	737	65	24	24	0	198	1 048
6 Usutu to Mhlatuze	404	54	40	91	0	104	693
7 Thukela	204	56	31	46	1	0	338
8 Upper Vaal	114	795	42	173	80	0	1 204
9 Middle Vaal	159	112	32	86	0	0	389
10 Lower Vaal	525	78	44	6	0	0	653
11 Mvoti to Umzimkulu	207	438	44	74	0	65	828
12 Mzimvubu to Keiskamma	190	100	39	0	0	46	375
13 Upper Orange	777	129	60	2	0	0	968
14 Lower Orange	780	28	17	9	0	0	834
15 Fish to Tsitsikamma	763	116	16	0	0	7	902
16 Gouritz	254	57	11	6	0	14	342
17 Olifants/Doring	356	7	6	3	0	1	373
18 Breede	577	43	11	0	0	6	637
19 Berg	301	423	14	0	0	0	738
Total for Country	7 836	3 332	572	756	296	488	13 280

Agricultural irrigation represents close to 60% of the total water requirements in the country, urban requirements constitute about 25% of the total as the second largest user sector, with the remaining 15% shared by the other four sectors (all standardised to 98% assurance of supply). The direct contribution by the agricultural sector to the gross domestic product is only about 4,5%, of which an estimated 25% to 30% is from irrigated agriculture. Therefore, the economic impact of water use in irrigation is substantially less than in other sectors. Employment by the agricultural sector (irrigation and dryland combined) accounts for about 11% of the total national employment, but only 10-15% of the total agricultural employment is in irrigated agriculture.

Future Water Requirements

There are many factors which influence the requirements for water in the country. These include climate, nature of the economy (i.e. irrigated agriculture, industrialisation) and standards of living. Population growth and economic growth, which also relates to socio-economic standards, are therefore regarded as the primary determinants with respect to future water requirements.

Changes in national policies since 1994, together with the influence of global economic trends, have stimulated migration to certain areas while declines in population have been experienced in others. Specifically evident are the strong urbanisation trend and the negative impacts of HIV/AIDS.

Based on a range of scenarios for population and economic growth, initial estimates of possible future water requirements were made for the period until the year 2025. Additionally, provision was made for known and probable future developments in irrigation, mining and other bulk uses. Where possible estimates were also made of the water required for poverty eradication strategies, which will depend on the specific requirements of local and regional development strategies. From this, it is evident that sufficient resources are available to meet all priority requirements for water for the next 25 years, provided they are well-managed.

Given the trends in the urbanisation and economic growth, the main challenge will be to ensure that water is available where it is needed.

A base scenario, built on the high scenario of population growth and more equitable distribution of wealth leading to higher average levels of water services, was selected for estimating the most likely future water requirements. A possible upper scenario of future water requirements is also given, based on the assumption of high population growth and high standard of services (socio-economic development); together with a strong increase in the economic requirements for water, where the public and business use of water would increase in direct proportion to the gross domestic product. The purpose of the upper scenario is to serve as a conservative indicator in order to prevent the occurrence of possible unexpected water shortages. Figures for the base scenario are presented in section 2.5, page 9.

2.5 STRATEGIES TO BALANCE SUPPLY AND DEMAND (RECONCILIATION)

Current situation

A "reconciliation" of the available water and total requirements for the year 2000, including transfers between water management areas and to neighbouring countries, is given in Table 2.4, page 8. The transfer of 124 million m³ per year out of South Africa relates to water from the Crocodile West and Marico water management area to Gabarone in Botswana (7 million m³ per year), the present minimum flow (a revised figure is being negotiated with Mozambique) released from the Inkomati water management area to Mozambique (63 million m³ per year), and abstractions from the yield of the Orange River Project by Namibia (54 million m³ per year).

More than half of the water management areas are in deficit, whilst a surplus still exists for the country as a whole, which demonstrates the regional differences in the country. Similarly, a surplus or deficit with respect to a particular water management area is unlikely to be representative of the situation in smaller areas within the water management area. Often it is not practical or economically viable for water to be transferred from areas of surplus to areas of deficit. Imbalances within water management areas will be addressed by the relevant catchment management strategies when they are developed.

In many cases the deficits do not mean that actual use exceeds supply, but that the estimated needs for the ecological Reserve cannot fully be met. The requirements for the Reserve are only indicative at present, but it is felt prudent to include this in the NWRS to guide implementation when the Reserve is formally brought into effect.

Existing surpluses will generally be taken up in the foreseeable future by growth in the domestic, urban, industrial and mining requirements for water. In a few instances existing surpluses are available and may beneficially be applied to irrigation or afforestation. In some cases, some quantity of water must be used to maintain water quality at the desired levels.

After abstraction of available yield and allowing for evaporation from reservoirs and rivers, about 66% of the natural river flow (mean annual runoff) remains in the country's rivers as a national average. The pattern of these flows has been significantly altered as a result of upstream regulation and use, and no longer reflects the natural stream flow characteristics. However, it substantially serves to meet the requirements of the Reserve, and to honour downstream international commitments. Some water is still available for allocation to new uses, although development of additional storage infrastructure may be required for this purpose, as shown in the following section.

Table 2.4: Reconciliation of water requirements and availability for year 2000 (million m³/a)

Water Management Area	Reliable* Local Yield	Transfers In	Local Requirements	Transfers Out	Balance
1 Limpopo	282	19	325	0	(24)
2 Luvuvhu/Letaba	310	0	334	13	(37)
3 Crocodile West and Marico	693	656	1 328	10	11
4 Olifants	611	172	971	8	(196)
5 Inkomati	943	0	1 048	148	(253)
6 Usutu to Mhlatuze	1 010	32	693	114	235
7 Thukela	738	0	338	497	(97)
8 Upper Vaal	1 723	1 443	1 204	1 481	481
9 Middle Vaal	201	791	389	605	(2)
10 Lower Vaal	50	651	653	0	48
11 Mvoti to Umzimkulu	527	34	828	0	(267)
12 Mzimvubu to Keiskamma	855	0	375	0	480
13 Upper Orange	4 557	2	968	3 105	486
14 Lower Orange	(1 007)	1 886	834	54	(9)
15 Fish to Tsitsikamma	437	571	902	0	106
16 Gouritz	277	0	342	1	(66)
17 Olifants/Doring	335	3	373	0	(35)
18 Breede	868	1	637	203	29
19 Berg	501	203	738	0	(34)
Total for Country	13 911	0	13 280	124	504

*The amount that can reliably be provided 98 years out of 100.

Future perspective

Table 2.5 provides an estimate of possible future (2025) requirements for water, as well as of potentially available water, for the base scenario. These provide an additional background to the development of national strategies as well as strategic perspectives for the respective water management areas. The base scenario, which is regarded as probable, does not show great change from the year 2000 situation. However, deficits are generally projected to increase and surpluses to diminish. The growth in surplus for the Crocodile West and Marico water management area results from growing wastewater return flows in the water management area.

Dramatic growth is projected under the high growth scenario, which is regarded as an upper extreme for testing the resilience of proposed strategic action plans. This can be met by resource development, principally through the construction of new storage dams although, since these are often not in the desired locations, transfer infrastructure may also be required.

Further development of groundwater resources is possible although the potential is substantially smaller than for surface water, and groundwater development may impact on surface water availability. The potential for resource development given in Table 2.5 should therefore be regarded as representative of the total undeveloped resource potential for both surface and groundwater.

From the demographic projections, which reflect the economic driving forces in the country, it is expected that future growth in water requirements will largely be in the main metropolitan centres. Together with catchments already under stress, particular attention will therefore have to be given to ensuring adequate future water supplies to these areas.

While issues of importance have been identified with respect to each of the water management areas, the following are of specific note from a national perspective:

- Crocodile West and Marico water management area – Large additional transfers of water to the Pretoria-Johannesburg area, in the upper reaches of the Crocodile catchment, will be required in future. Specific attention will need to be given to the balance between the transfer of water and re-use of return flows.
- Olifants water management area – Addressing deficits which will result from implementation of the Reserve and future water supplies for power generation and mining. Possible impacts on Mozambique to be considered.
- Inkomati water management area – Current deficits, and impacts associated with implementation of the Reserve need to be addressed, with joint management of the Komati River being of specific importance.
- Upper Vaal water management area – This water management area should be adequately supplied until 2025, given the projections in the base scenario. The existing surplus transfer capacity is to be reserved for urban, industrial and mining developments, and not used for irrigation.
- Mvoti to Umzimkulu water management area – Ensuring adequate future water supplies for the Durban-Pietermaritzburg metropolitan area.
- Berg water management area – Provision of water to meet future requirements in the greater Cape Town area.

Table 2.5: Reconciliation of water requirements and availability for year 2025 base scenario (million m³/a)

Water Management Area	Local Yield	Transfers In	Local Requirements	Transfers Out	Balance	Potential for Development
1 Limpopo	281	18	347	0	(48)	8
2 Luvuvhu/Letaba	403	0	349	13	41	102
3 Crocodile West and Marico	805	901	1 594	10	102	0
4 Olifants	630	210	1 075	8	(243)	239
5 Inkomati	1 073	0	1 088	148	(163)	114
6 Usutu to Mhlathuze	1 011	32	700	114	229	110
7 Thukela	742	0	347	497	(102)	598
8 Upper Vaal	1 818	1 743	1 440	2 042	79	50
9 Middle Vaal	205	775	400	580	0	0
10 Lower Vaal	48	648	645	0	51	0
11 Mvoti to Umzimkulu	555	34	1 012	0	(423)	1 018
12 Mzimvubu to Keiskamma	872	0	413	0	459	1 500
13 Upper Orange	4 799	2	1 022	3 496	283	900
14 Lower Orange	(1 001)	1 931	883	54	(7)	150
15 Fish to Tsitsikamma	452	595	979	0	68	85
16 Gouritz	278	0	353	1	(76)	110
17 Olifants/Doring	335	3	371	0	(33)	185
18 Breede	869	1	639	203	28	197
19 Berg	506	203	829	0	(120)	210
Total for Country	14 681	0	14 486	124	68	5 576

Development Opportunities

Strategic opportunities for further resource development should be noted in the Luvuvhu/Letaba, Thukela, Mvoti to Umzimkulu, Mzimvubu to Keiskamma, and Upper Orange water management areas.

In addition to supporting urban, industrial and mining growth, opportunities for increased water use include:

- Expansion of irrigation in the Lower Orange and Fish to Tsitsikamma water management areas with water from the Upper Orange water management area.
- Expansion of irrigation below Pongolapoort Dam in the Usutu to Mhlathuze water management area.
- Refurbishment of irrigation schemes and additional development in the Mzimvubu to Keiskamma water management area, as well as some limited hydropower generation.

- Expanded forestry development in some catchments in the Usutu to Mhlathuze, Thukela, Mvoti to Umzimkulu and Mzimvubu to Keiskamma water management areas.
- Expansion of irrigation in the north-eastern part of Limpopo Province (from the Nandoni Dam in the Luvuvhu River).

Reconciliation Interventions

The NWRS allows for changes in emphasis and the revision of action plans as growth and development progress and improved insights are gained. The main interventions by which a balance between the availability of and requirements for water may be achieved are addressed below.

- Demand management - Management of the demands (requirements) for water has been applied with great success by some users and could be used at water management area level to move from deficit to surplus.
- Resource management - Regulation of streamflow through storage and the control of abstractions and releases, to provide appropriate quantities of water at specific times and locations (inter-basin transfers), and of such quality and reliability to meet user requirements is the traditional approach.
- Development of surface water resources - there is substantial potential for further development of surface water resources in some parts of the country, through construction of storage and transfer infrastructure..
- Inter-catchment transfers - inter-catchment transfers will be necessary in many cases in South Africa.
- Managing groundwater resources - Potential exists in certain areas for larger scale development of groundwater resources.
- Re-use of water – While most water used in a non-consumptive manner is directly recycled for re-use or returned to the rivers for re-use elsewhere, there is further potential, particularly in coastal areas.
- Control of invasive alien vegetation - Estimates suggest that close to 3% of the national mean annual runoff is intercepted by invasive alien vegetation. Removal and containment of such vegetation may contribute to catchment management strategies.
- Re-allocation of water - The re-allocation of water between user sectors is an obvious and powerful option. The National Water Act provides for the re-allocation of water to be gradually introduced as the need arises in different parts of the country using pricing, compulsory licensing, water demand management, and trading of water use authorisations.
- Water quality considerations - Although not a reconciliation intervention in itself, water quality is a fundamental concern in water resources management. In addition to making sufficient quantities of water available for use at specific locations and times as required, reconciliation strategies must ensure that water is of appropriate quality for the intended uses.

Varying combinations of the above options will have to be employed, as many are suited to the situation in each water management area or sub-area. Possible resource developments are listed in Tables 3.2 and 3.3, page 30.

2.6 OTHER FACTORS INFLUENCING WATER AVAILABILITY AND WATER REQUIREMENTS

The availability of and requirements for water are subject to other external influences which include:

- **Land use** - Land use practices can alter the proportion of rainfall that reaches surface streams or penetrates to groundwater. Land uses which may influence water availability include afforestation, alien vegetation, dry-land cultivation of crops, grazing practices, urban development, and soil erosion resulting in reservoir sedimentation.
- **Climate change** - There is evidence that global temperatures are rising, with some climatic models suggesting that this could cause a decrease in runoff in South Africa, spreading progressively from west to east during the next few decades.

2.7 WATER RESOURCES UNDER THE DIRECT CONTROL OF THE MINISTER

A proportion of the available water in each water management area is under the direct control of the Minister in terms of his or her national responsibilities. This includes:

- **The Reserve** - Sufficient water of appropriate quality to provide for basic human needs; and for safeguarding and sustaining healthy ecosystems.
- **Water to meet international rights and obligations** – The share of the international waters as negotiated from time to time through the relevant bi-national and multi-lateral forums.

- **Water use of strategic importance** – Since electricity is fundamental to the functioning of modern society allocations of significant quantities of water used by Eskom in the generation of electricity is authorised by the Minister. Allocations reserved for transfer between water management areas are also established by the Minister in this Strategy.
- **A contingency to meet projected future water needs** – This may include water reserved for use outside a water management area or for specific large augmentation projects within it.

A more detailed analysis of South Africa's water situation is presented in Appendix D of the NWRS, which provides present and future water balance information, and possible reconciliation interventions, for subdivisions of the 19 water management areas.

CHAPTER 3 STRATEGIES FOR WATER RESOURCES MANAGEMENT

CHAPTER 3, PART 1: PROTECTION OF WATER RESOURCES

3.1.1 INTRODUCTION

The aim of protecting water resources is to ensure their continuing availability for human use, by leaving enough water of appropriate quality in rivers and streams to maintain their ecological functioning. Two complementary approaches will apply:

- **Resource-Directed Measures (RDM)** focus on the quality and the overall health of water resources. Resource quality includes water quantity and water quality, the character and condition of in-stream and riparian habitats, and the characteristics, condition and distribution of the aquatic biota.
- **Source-Directed Controls** are primarily designed to control water use activities at the source of impact, through tools such as standards, and conditions in water use authorisations.

3.1.2 RESOURCE-DIRECTED MEASURES

Resource-directed measures include the following elements:

- Development of a National Classification System;
- Determination of the class of specific water resources;
- Establishment, for each significant water resource, of resource quality objectives and determination of the Reserve in accordance with the class of the resource.

The full set of resource-directed measures is still under development, and will be established after public consultation in terms of other provisions in the Act - not via the NWRS - in due course. A summary of the current proposals is provided here for completeness.

National System for Classifying Water Resources

It is not economically possible or desirable to protect all water resources to the same degree. The water resource classification system will group water resources into broad management classes, each representing a different level of protection and utilisation. The classification system will apply to all surface water resources in South Africa, but it will be sufficiently flexible to accommodate the different characteristics of rivers, wetlands, impoundments and estuaries.

The following management classes for water resources are being considered:

- **Natural** - No or minimal changes to biological communities, hydrological characteristics, or the bed, banks and channel of the resource; chemical concentrations are not significantly different from background concentration levels for naturally occurring substances, and concentration levels of artificial substances do not exceed the detection limits of advanced analytical methodologies.
- **Good** - resource conditions are slightly to moderately altered from the *Natural* class conditions.
- **Fair** - resource conditions that are significantly changed from the *Natural* class conditions.
- **Poor** - resources in a condition below *Fair* and considered unable to sustain functional ecosystems.
- **Severely Modified** - water resources so severely and permanently physically modified (e.g. rivers that have been canalised through urban areas, or for flood protection) that rehabilitation is not possible. These will be classified as *Severely Modified*, and will not be considered as functional ecosystems.

The quantitative and/or descriptive characteristics that will be used to classify surface water resources include chemical and physico-chemical, biological and hydrogeomorphological characteristics. Each management class will represent a range of values for each characteristic, with the values defined at the boundaries between classes.

Water resources will, as far as possible, be managed within the boundaries of their management class.

However, in the case of *Poor* resources, the management class may be set as a minimum of *Fair*, and management will aim to rehabilitate the resources to this status.

Determination of Resource Quality Objectives and the Reserve

The Reserve includes water to meet basic human needs, and water to protect aquatic ecosystems. It has priority over all water uses, and the requirements of the Reserve must be met before water can be allocated for other uses. However, where water is already allocated for use, the requirements of the ecological Reserve may be met progressively over time.

Resource quality objectives provide numerical or descriptive statements about the biological, chemical and physical attributes that characterise a resource for the level of protection defined by its class. They include:

- The quantity, pattern, timing, water level and assurance of instream flow (the ecological Reserve);
- The water quality, including the physical, chemical, and biological characteristics of the water;
- The character and condition of the instream and riparian habitat; and
- The characteristics and condition of the aquatic biota.

The determination of the management class, the related resource quality objectives and the Reserve will normally be undertaken as an integrated exercise. Procedures will range from rapid, low resolution methods to more time-intensive and higher resolution methods, that can be flexibly utilised depending on management requirements. They will be applied in a phased approach to attain full coverage of all significant water resources, in accordance with the programme for compulsory licensing described in Part 8, page 28.

3.1.3 SOURCE DIRECTED CONTROLS

Source directed controls include:

- **Best management practice measures** that apply nationally.
- **Special measures**, derived from catchment management strategies and/or plans.
- **Site specific measures**, stemming from the authorisation process, taking account of considerations specific to the water use being considered.

Source directed controls will be implemented through the conditions specified in licences and general authorisations (see Part 2, pages 14 and 15) for each type of use, so that the cumulative impact of all uses does not exceed the limits appropriate to the management class of the resource. Source directed controls will also inform the drafting of regulations on water use under section 26 of the Act.

3.1.4 PROTECTION OF GROUNDWATER RESOURCES

Classification of Groundwater Resources

The classification system for groundwater will be similar to that for surface waters, but with its own unique features. Determining the practicable level of protection necessary for individual groundwater resources will take account of:

- The social, economic and ecological importance of the resource, regionally and/or locally.
- The vulnerability of the resource to pollution and other impacts.
- Groundwater recharge areas, particularly where these are separate from abstraction areas (e.g. in mountainous areas).

The Groundwater Reserve

Reserve determinations for surface water resources consider groundwater where aquifers are connected to surface waters, and contribute to low flows required for ecological maintenance. However, a groundwater Reserve must also be determined for aquifers that are not connected to surface waters, and where people are supplied with water from groundwater. The methods for this are currently being developed.

Resource Quality Objectives for Groundwater Resources

Resource quality objectives for groundwater resources will relate to:

- Groundwater levels or gradients (time- and locality-specific);
- Groundwater quality;
- Spring flow;
- Targets for the health of terrestrial ecosystems that are dependent on groundwater.

3.1.5 WATER QUALITY MANAGEMENT

The new approach to resource protection embraces both water quantity and water quality considerations. For clarity, this section provides an overview of the issues specifically relevant to water quality. In general:

- The receiving water quality objectives approach will continue to be used for non-hazardous substances;
- The pollution minimisation and prevention approach will continue to be used for hazardous substances;
- Source-directed controls for water quality will include identification of emerging threats to the water resource, and priorities for appropriate action.

Receiving Water Quality Objectives

The Receiving Water Quality Objectives approach assumes that the water environment has a finite capacity to assimilate non-hazardous wastes discharged into it without violating water quality objectives. Consideration of applications to discharge wastes will be preceded by assessments of the impacts of the proposed discharges. To facilitate the process standards for discharges will be prescribed by regulation, and relaxation of standards will be contemplated only where there are pressing social or economic reasons to do so, and only if the resource will not be unacceptably impacted.

Water Quality Management Approaches

The approach to promoting the water quality dimension of resource protection will therefore be as follows:

- The prevention, reduction, recovery and treatment of waste will be encouraged by applying best management practice measures as part of source-directed controls.
- If the application of best management practice measures still results in a need for discharge of water containing waste or the disposal of waste, a minimum requirement or standard will apply.
- Until applicable waste standards are developed for implementation, the current General and Special Effluent Standards will apply;
- If the applicable minimum requirements or standards are not sufficient to ensure suitable water quality as required by resource quality objectives, requirements or standards stricter than the minimum requirements or standards will be applied.
- Deviation from minimum requirements or standards, or from special or site-specific sourcedirected controls, will receive consideration if enforcement of these measures could have significant negative social or economic impact which outweighs the ecological benefits.
- Reclassification of the water resource, due to irreversible water resource impairment, will be considered only under very special environmental value requirements.
- For other water uses that impact on water quality, such as impeding or diverting the flow of water in a water course, measures required to meet resource quality objectives will be stipulated by guidelines or directives.

Remediation Measures

Remediation strategies will address impaired, degraded and contaminated land areas and water resources. Clean-up levels and targets, remediation approaches and measures as well as prioritisation of remediation focus and effort will be primarily dictated by appropriate risk-based approaches. Application of the relevant financial provisions of the NWA to cover remedial action will form part of the remediation strategy. Until the remediation strategy has been developed and implemented, current regulatory instruments will be used for specific situations.

CHAPTER 3, PART 2: WATER USE

3.2.1 INTRODUCTION

The regulation of water use will be achieved through formal water use authorisation that will impose limits and restrictions on water use. Conditions of use are the essential operational link between the need to protect water resources, and the need to use water for social and economic development.

3.2.2 WATER USE

The Act recognises the following kinds of water uses:

- Taking (abstracting) water from a water resource;
- Storing water;
- All aspects of the discharge of wastes into water resources, including:
 - Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;
 - Disposing of waste in a manner which may detrimentally impact on a water resource;
 - Disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;
- Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people;
- Making changes to the physical structure of rivers and streams:
 - Impeding or diverting the flow of water in a watercourse;
 - Altering the bed, banks, course or characteristics of a watercourse;
- Certain activities which may affect the quantity or quality of water in the resource:
 - Engaging in a stream flow reduction activity contemplated in section 36;
 - Engaging in a controlled activity identified as such in section 37 or declared under section 38; and
- Using water for recreational purposes.

Priorities for allocating water, in order of importance are:

- Provision of the Reserve;
- Meeting international obligations;
- Meeting the need for water for strategic purposes;
- Meeting the needs of general social and economic uses.

3.2.3 AUTHORISING WATER USE

Types of Authorisations

There are three types of water use authorisations:

- **Schedule 1 uses** - relatively small quantities of water, mainly for domestic and stock watering purposes, but also for emergency situations and certain recreational purposes.
- **General authorisations** - by which limited water use is conditionally allowed without a licence. Current general authorisations are described in Government Notice No. 1191, 8 October 1999.
- **Water use licences** - which are used to control water use that exceeds the limits imposed by Schedule 1 and general authorisations.

Water Use Licences

Licences give existing or prospective water users formal authorisation to use water for productive or beneficial purposes. A licence to use water may only be issued by a "responsible authority" (See Part 5, page 20), to which a prospective user must apply. A licence:

- Replaces all previous entitlements, if any, to use water for the purpose specified in the licence;
- Is specific to the user to whom it is issued, and to a particular property or area;
- Is specific to the use or uses for which it is issued;
- Is valid for a specified time period, which may not exceed 40 years;
- May have a range of conditions attached to it; and
- Must be reviewed by the responsible authority at least every five years.

As a transitional measure the Act permits water use that was lawfully exercised under any law which preceded the NWA - existing lawful water use - to continue under the same conditions until such time as it is formally licensed.

Applications

The following applies with regard to applications for licences:

- Applications may be made individually, or generally as part of a compulsory licensing process (see below).
- In general individual licence applications will be for new users, existing users who wish to increase or change their use, and existing users who wish to continue their use in terms of an existing limited duration authorisation. Most existing users will acquire licences during compulsory licensing.

- A detailed procedure has been established for individual licence applications. Applicants can request technical, administrative and financial assistance from the responsible authority to make their applications.

Compulsory licensing

Compulsory licensing will apply if it is desirable that water use in respect of one or more water resources within a specific geographic area be licensed:

- To achieve a fair allocation of water from a stressed water resource;
- When it is necessary to review prevailing water use to achieve equity in allocations;
- To promote beneficial use of water in the public interest;
- To facilitate efficient management of the water resource and to protect water resource quality.

The process for compulsory licensing will be as follows:

- Existing use and its lawfulness is verified.
- The responsible authority issues a notice calling for licence applications to all registered water users (see later) and potential users.
- Users and prospective users prepare and submit licence applications.
- The responsible authority evaluates all licence applications.
- The responsible authority develops possible solutions for reconciling water requirements with water availability.
- The responsible authority prepares, publishes and invites public comment on a proposed allocation schedule.
- After considering all comments on the proposed allocation schedule, and making necessary amendments, a preliminary allocation schedule must be published.
- The preliminary allocation schedule is amended in the light of successful appeals to the Water Tribunal.
- The responsible authority publishes the final allocation schedule in the *Government Gazette*.
- As soon as reasonably practicable after the final allocation schedule has been published, the responsible authority must issue licences to water users in accordance with its provisions.

Evaluation of Licence Applications

All licence applications, whether individual or compulsory, must be evaluated against the factors specified in section 27 of the Act. A detailed procedure is being developed to facilitate evaluation of licence applications.

Requirements for Licences and Licence Conditions

Sections 28 and 29 of the Act describe, respectively, the essential information that must be included in a licence, and the conditions under which the water use is authorised. As far as possible conditions of use will be determined by negotiation and agreement with users, and every case will be decided on its individual merits.

One of the most important attributes of a licence is its period of validity. The evaluation procedure for licence applications will contain broad guidelines for determining the licence period. In addition to the licence period, water use may be subject to a range of other conditions, which are jointly intended to ensure that the total use from a particular water resource does not unreasonably prejudice the integrity of the resource, that individual uses do not unreasonably prejudice other users, and that water resources are effectively managed.

Review and Amendment of Licences

Conditions attached to licences will not necessarily remain unchanged throughout the life of the licence. Any condition, except the licence period, may be amended on review (at least every five years) if such amendments are necessary to maintain the integrity of the water resource, to achieve a balance between available water and water requirements, or to accommodate changes in water use priorities. Licence conditions for all similar uses from the same water resource must be reviewed together, and amended in an equitable manner. At each general review the responsible authority may, after considering all relevant factors, extend the licence period, but only by the length of a single review period.

Compliance with Conditions of Water Use

All water users are required to adhere to the conditions of use attached to permitted water uses and responsible authorities are required to ensure that they do so. A responsible authority may issue a notice directing the user to rectify the contravention. If the user fails to comply with the notice, the responsible authority may suspend or withdraw the entitlement to use water. Failure to comply with any condition of use is an offence under the Act, and the responsible authority may choose to prosecute an offending user.

A comprehensive compliance management strategy will be developed during the course of the first compulsory licensing exercise, and implemented when a significant number of licences have been issued.

Registration of Use

As an essential preliminary step towards licensing, and to enable water pricing to be implemented, a country-wide process to register existing water uses (taking and storing water, and stream flow reduction activities) has been undertaken. A sufficiently high number of users (more than 80% of the total volume used in these three uses) has been registered to enable water use charges to be equitably made. Unregistered users are now liable for a penalty charge for late registration, and risk losing their existing entitlements if they fail to register. Other water uses will be registered in due course.

Verification of Existing Water Use

The responsible authorities will be required to verify the extent and lawfulness of all existing water uses, before compulsory licensing is undertaken. *Ad hoc* verifications of individual uses may also be undertaken if it is necessary. Verification of existing use will also be used to extend registration to all water uses.

Transfer of Water Use Authorisations

Water use authorisations may be transferred, on application to the relevant authority, through:

- **A temporary transfer of water**, authorised by a water management institution, for irrigation either on the same property for a different use, or to another property for the same or a similar use. In general temporary transfers will be for one year only, with the option of applying for an extension of a further year.
- **Permanent transfers**, authorised by a responsible authority, which may be effected by one user offering to surrender all or part of an allocation to the responsible authority to facilitate a licence application by another user. In this case, the new licence application will be subject to all the relevant requirements of the Act regarding applications for licences.

Transfers, whether temporary or permanent, will only be permitted where both the original and transferred water use are from the same water resource.

Water Use of Strategic Importance

A water use of strategic importance is one that is considered to be of such critical national importance that it will be authorised by the Minister, as follows:

- Water transferred from one water management area to another.
- All water taken from a water resource, or stored, for use at Eskom power generation facilities.

Using Water for Recreational Purposes

An approach is being developed to ensure that recreational water use is equitable and sustainable, compatible with other water users, and within the capacity of the resource. The approach includes:

- A policy on using water for recreational purposes, which provides overall guidance and direction;
- An implementation programme, and
- A planning procedure for the preparation of utilisation plans and management structures, which ensures that all stakeholders have the opportunity to participate.

Section 113 of the Act empowers the Minister to make the water of government waterworks and the surrounding State-owned land, particularly at State-owned dams, available for recreational purposes. Special attention will be given to policies governing access to, and the use and development of the water surface and surrounding land for recreational purposes in these cases.

Regulations on Water Use

The NWA provides the broad legal framework for water resources management that enables the Act's requirements to be implemented in practice. Implementation details are found in regulations. Current regulations include:

- Government Notice No. 704, 4 June 1999, National Water Act, 1998 (No. 36 of 1998): Regulations on the use of water for mining and related activities aimed at the protection of water resources.
- Government Notice No. 1352, 12 November 1999, National Water Act, 1998 (No. 36 of 1998): Regulations requiring that a water use be registered.

Other regulations that are in preparation, or are contemplated in the near future will deal with:

- Limiting or restricting the purpose, manner or extent of water use in respect of impeding or diverting the flow of water in a watercourse; altering the bed, banks, course or characteristics of a watercourse; and using water for recreational purposes.
- The outcomes or effects of management practices for waste treatment, to encourage reduction of wastes at source, recycling, detoxification and neutralisation.
- Transactions in respect of authorisations to use water (trade).

CHAPTER 3, PART 3: WATER CONSERVATION AND WATER DEMAND MANAGEMENT

3.3.1 INTRODUCTION

The options for further augmentation of water supply by developing physical infrastructure are limited, and in future attention must be devoted to managing the demand for water. Water conservation and water demand management relate to the efficient and effective use of water, and the minimisation of loss or waste of water.

3.3.2 THE NATIONAL WATER CONSERVATION AND WATER DEMAND MANAGEMENT STRATEGY

The National Water Conservation/Water Demand Management (WC/WDM) Strategy that is currently being developed is based on the premises that many water users can maintain their quality of life and achieve the desired outcomes from their water use whilst using less water, and that significant reductions in water use can be achieved by changes in behaviour and the adoption of water-saving technologies.

The National WC/WDM Strategy is based on three fundamental principles:

- Water institutions should strive to supply water efficiently and effectively, minimise water losses, and promote WC/WDM among their consumers.
- Users should not waste water, and should strive to use it efficiently.
- WC/WDM should be an integral part of water resources and water services planning processes. In situations of water shortage the appropriateness and cost effectiveness of demand-side solutions must be considered alongside supply-side augmentation options.

The foundation of the WC/WDM Strategy is the creation of a WC/WDM culture within all water management and water services institutions and among water users.

3.3.3 SECTORAL STRATEGIES

Water Services

Although the local government water supply and sanitation services sector accounts for only about 15% of total national water use, it is the sector with the highest expected growth in demand. More efficient use of water will reduce the costs associated with purifying and distributing water to consumers, and with the subsequent treatment of waste water. Proposed strategies include:

- Water Services Authorities will be required, as part of their Water Services Development Plans, to develop a WC/WDM strategy in accordance with the model strategy prescribed by DWAF.
- Water Boards will be required to develop their WC/WDM strategies according to the model strategy prescribed by the Department, and submit them as part of their business plans.

Agriculture

Irrigated agriculture accounts for almost 60% of water used in South Africa. There are significant losses in many distribution and irrigation systems and, whilst there are areas where water use is efficient, substantial improvements can be achieved in others. Proposed strategies include:

- Consideration to requiring water users in the agriculture sector applying for a licence for water use, to develop and submit, to the responsible authority, a water management plan in accordance with the Implementation Guidelines for Water Conservation and Demand Management in Agriculture: Development of Water Management Plans.

Industry, Mining and Power Generation

The well-being of this sector is crucial to South Africa's economic development, and it requires a high degree of certainty that its water needs will be satisfied. There is nevertheless scope for water use to become more efficient without adverse impacts on economic activity. Proposed strategies include:

- Industrial users who require a licence for water use (that is, users who draw their water direct from a water resource) will be required, by December 2005, to develop and submit, to the responsible authority, a water management plan in accordance with the Implementation Guidelines for Water Conservation and Demand Management in Industry.

3.3.4 COMMUNICATION, COMMUNITY AWARENESS, EDUCATION AND MARKETING

The community awareness component of the programme will promote an understanding of, and support for WC/WDM among the general public, whilst the education component will be carried out in schools. The marketing component will promote WC/WDM in water management and water services institutions, and develop supportive networks among them.

3.3.5 CONTROL OF INVASIVE ALIEN VEGETATION

Estimates indicate that about 10 million hectares of land in South Africa are infested with invasive alien plants, and that they can cause significant reductions in runoff in some of the catchments where they occur. The problem is already significant, and will worsen if no action is taken.

Invasive vegetation is a land management issue with strong environmental considerations, and its management must be approached in a co-ordinated multi-sectoral way. The Working for Water Programme, a joint programme of the Department of Environmental Affairs and Tourism, the National Department of Agriculture and the Department, aims to progressively clear infestations of invasive alien plants everywhere in the country, and ensure that follow-up work is undertaken so that they do not recur. The Programme's activities also contribute to social development by creating employment and training opportunities, and promotes the establishment of secondary industries to use the harvested wood.

Clearing work is undertaken on State-owned land, and also on privately-owned land by agreement with the landowner. Where necessary regulations under the Conservation of Agricultural Resources Act are used to enforce follow-up work. The Programme is currently funded largely through special poverty relief funds, but the intention is for the costs of vegetation clearing activities which contribute to increasing water availability to be partially funded from water resources management charges on water users (see Part 4 following).

CHAPTER 3, PART 4: WATER PRICING AND FINANCIAL ASSISTANCE

3.4.1 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. The Act provides for water use charges to:

- Fund water resources management;
- Fund water resource development and use of waterworks and
- Achieve the equitable and efficient allocation of water.

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.

3.4.2 WATER PRICING STRATEGY FOR WATER USE CHARGES

The pricing strategy, which relates to charges for any water use, is established in terms of section 56 of the Act, and *not* via the NWRS. A summary is provided here for completeness.

The pricing strategy applies only to the use of raw (untreated) water, 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 and distributed to households, which is dealt with in the Water Services Act, 1997.

The overall pricing strategy will comprise several components which will be established and implemented progressively over time, and includes charges for:

- Abstracting and storing water and stream flow reduction activities (this component was established by Government Notice No. 1353, 12th November 1999);
- Waste discharge (e.g. controlled activities, discharging waste or water containing waste, disposing of waste in a manner that is detrimental to a water resource, waste from industrial or power generating processes, discharging water found underground) to be established in 2003.
- Other components such as impeding or diverting flow, altering the physical characteristics of a watercourse and the use of water for recreational purposes, if necessary and practical.

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

Setting charges, collecting and disbursing revenue

The responsible authority will set charges and collect revenue. Charges may differ between water management areas, depending on the socio-economic circumstances and physical and demographic characteristics of each area. 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. 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 (e.g. commercial forestry). Charges may be different for each user sector.

Charges for Funding Water Resources Management

These charges will be based on the budgeted annual costs of water resources management activities. The following will apply:

- Water which is used in terms of Schedule 1 will not incur a charge;
- The municipal sector and the industrial, mining and energy sector will attract all charges relating to water resources management.
- The agricultural sector will attract all charges *except* those related to the control of invasive alien vegetation.
- The stream flow reduction activity sector will attract all water management activity costs *except* those related to dam safety control and invasive alien vegetation control.
- Transfer of water from one WMA 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 which benefit from the transferred water, will revert to the source area for water resources management purposes.

Charges for Water Resource Development and Use of Waterworks

Water Resource Development Charges

Charges for water resource development on government water schemes will be based on the rate of return on assets approach, with allowance for the depreciation of asset value. Capital cost charges on government water schemes will consist of:

- A charge based on a 4% return on the depreciated replacement value of assets, and
- A charge based on the annual depreciation cost, depreciated in a straight line over the asset's remaining economic life.

On multipurpose government water schemes, capital costs will be divided between sectors on the basis of water allocations. Charges may be different for different sectors depending on the assurance of supply required or on peak demand rates.

Charges for the Use of Waterworks

These charges will be based on the annual costs of operating and maintaining waterworks. Users of water from specific government water schemes will pay all the scheme-related costs. Charges will be phased in progressively over time, and the target of achieving full cost recovery will be achieved at different times for different sectors.

Charges for Achieving the Equitable and Efficient Allocation of Water

Administratively-Determined Charges, Public Tender or Auction

- Charges may be determined administratively, by basing them on the opportunity cost of water, as reflected in the price paid for water in transactions taking place between users.
- In areas where compulsory licensing has been completed, any remaining water may be allocated for use by public tender or auction.

Water Trading

Administratively-determined charges, public tender or auction may not be needed in areas where trade in water use is permitted to take place. Regulations will be introduced specifying the conditions under which trade will be permitted after compulsory licensing has been completed.

Application of Charges for Achieving the Equitable and Efficient Allocation of Water

This charge will be determined by the Minister, and will be introduced only when the effects on resource use of full financial pricing of water have been evaluated.

3.4.3 FINANCIAL ASSISTANCE

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

- **Via 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.
- **Via section 61 of the Act:** Capital cost subsidies are available to emerging farmers who are members of water user associations, for the construction of communal waterworks. Limited operational subsidies will be available to water user associations that take over the operations and maintenance of government water schemes.

These policies are currently the subject of an interdepartmental review.

CHAPTER 3, PART 5: WATER MANAGEMENT INSTITUTIONS

3.5.1 INTRODUCTION

The Act provides for a fundamental transformation of water resources management and governance, through decentralisation of the responsibility and authority for water resources management to appropriate, representative, regional and local institutions.

3.5.2 INSTITUTIONAL FRAMEWORK FOR WATER MANAGEMENT

Minister of Water Affairs and Forestry

The Minister, as the public trustee of water resources on behalf of the National Government, has overall responsibility for all aspects of water resources management in South Africa. For practical reasons the Act allows the Minister to delegate most of his or her powers and duties to departmental officials, water management institutions, advisory committees, and water boards.

The Minister will retain the responsibility for:

- Specifying the requirements of the Reserve;
- Specifying water requirements for international rights and obligations;
- Specifying a "contingency" to meet projected future water needs;
- Authorising any transfers of water between water management areas; and
- Authorising other water uses of strategic importance.

Department of Water Affairs and Forestry

At present the Department is responsible for administering all aspects of the Act on the Minister's behalf. The Department's role will progressively change, as regional and local water management institutions are established and the responsibility and authority for water resources management are delegated and assigned to them. The Department's eventual role will mainly be to provide the national policy and regulatory framework within which other institutions will directly manage water resources, and to maintain general oversight of the institutions' activities and performance.

The Department's organisational structure is changing to accord with this new role. The following principles and approaches are guiding the transformation of the Department:

- The Department will progressively withdraw from direct involvement in the development, financing, operation and maintenance of water resources infrastructure.
- The Department will transfer the responsibility for operating and maintaining infrastructure to other institutions such as catchment management agencies and water user associations.
- The establishment and empowerment of catchment management agencies for all water management areas should proceed as quickly as possible.

The new organisational design for water resources management in the Department is expected to be finalised early in 2003, and details will be made publicly available.

Water Management Institutions and Responsible Authorities

Under the Act, a water management institution may be a catchment management agency, a water user association, a body responsible for international water management or any person who fulfils the functions of a water management institution. The powers and duties of a water management institution relate to water resources management in general. The Act also defines a responsible authority, whose duties relate specifically to water use, and particularly to the authorisation of water by general authorisation or licence. A responsible authority may be the Department or a catchment management agency to which the Minister has delegated or assigned this function.

Water Management Areas and Catchment Management Agencies

After a country-wide process of public consultation, nineteen water management areas (Figure 3.1) were established in South Africa, in October 1999 by Government Notice No. 1160. The boundaries of the water management areas are described in the full National Water Resource Strategy document.

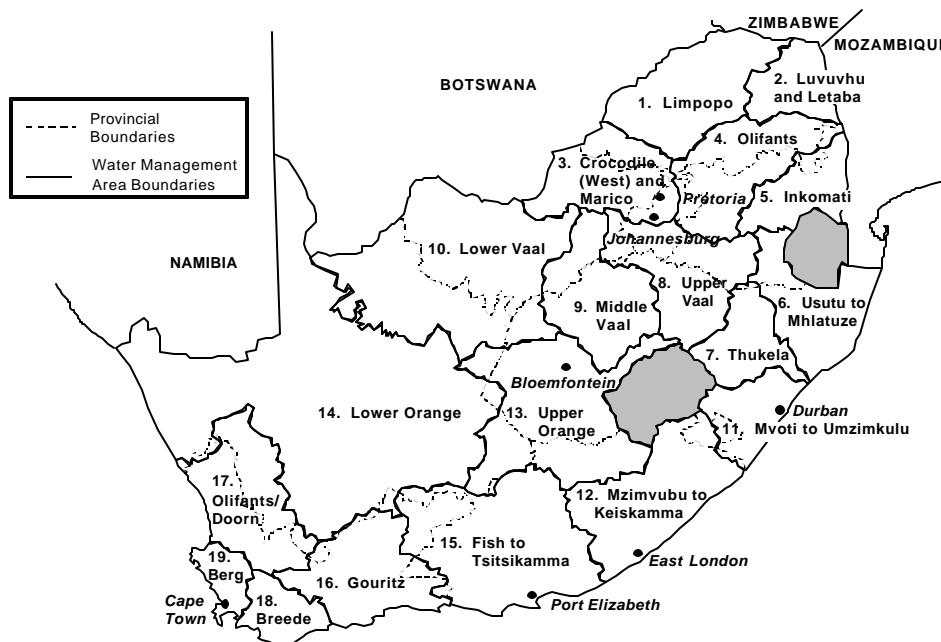


Figure 3.1: Water management areas

Catchment management agencies (CMAs) are statutory bodies, established by Government Notice, with jurisdiction in a defined water management area. Functions and responsibilities of CMAs include:

- Development of a catchment management strategy, which may not be in conflict with the NWRS while giving effect to its provisions and requirements.
- Management of water resources, and co-ordination of the water-related activities of water users and other water management institutions within water management areas.
- Additional functions may be delegated or assigned to a CMA by the Minister. The delegation and assignment of duties and responsibilities should progress from the initial functions, to the financial and administrative responsibilities for setting and collecting water use charges, to the technical water resources management functions based on the issues identified in the catchment management strategy.

CMAs may be established either on the Minister's initiative, or as a result of a proposal, submitted to and approved by the Minister. The proposal must include, among other information, details of the boundaries within which the proposed agency will operate, information about the water resources and existing infrastructure in the area, and the ways in which they are managed. An agency is functional once a Governing Board has been appointed by the Minister.

In areas where agencies have not yet been established, or where they are not yet fully functional, all powers and duties vest in the Minister, and the Department will undertake the agencies' functions on the Minister's behalf.

Water User Associations

Water user associations are co-operative associations of individual water users who wish to undertake water-related activities at a local level for their mutual benefit. They operate in terms of a formal constitution as set out in guidelines prepared by the Department. They are expected to be financially self-supporting from water use charges determined and made in terms of the pricing strategy, and payable by members. A water user association falls under the authority of the

catchment management agency in whose area of jurisdiction it operates, if the agency has received powers from the Minister to direct the association's activities. An association may receive delegated powers and duties from the catchment management agency to undertake activities that are within the scope of its constitution.

Establishment

- Existing irrigation boards, subterranean water control boards and water boards established for stock watering purposes in terms of the 1956 Water Act, must be transformed to become water user associations, or be disestablished.
- New water user associations may be established for any purpose, although it is expected that the majority will continue to focus on supporting agricultural water use.
- New associations may be established on the Minister's initiative, or as a result of a proposal, submitted to the Minister, by those wishing to establish the association.
- The Minister must ensure that a consultation process is undertaken before establishing an association or transforming an existing board.

Advisory Committees

The Act empowers the Minister to establish advisory committees, for different purposes and with different functions. Although primarily advisory in nature, such committees may also exercise powers which the Minister delegates to them. Advisory committees are responsible to the Minister, who may make regulations concerning their terms of reference, membership, powers, duties and operation. The Act obliges the Minister to establish an advisory committee to make recommendations on the composition of the Governing Board of a catchment management agency.

Forums

Although not statutory organisations, forums have made significant contributions to water resources management at a local level by, among other things, providing essential local knowledge, expertise and information. In this respect they may eventually be expected to play an important role in the operation of catchment management agencies when they are established. The Department will continue to support existing forums, and encourage the creation of new ones where the necessity arises.

Institutions for Infrastructure Development and Management

The Department owns, operates and maintains many water resources schemes. It is envisaged that these will be dealt with as follows:

- The responsibility for operating and maintaining schemes that are of local importance, or mainly serve one user sector, will be transferred to water user associations, water boards or local authorities as appropriate.
- Policy proposals are being developed, and are expected to be finalised by the end of 2002, for the development and management of schemes of wider importance that are regarded as national water resources infrastructure (e.g. transfers across national boundaries or between water management areas; schemes serving multiple user sectors or large geographic areas etc.) Options for the management of national infrastructure, and the development of new infrastructure as required, include:
 - The creation of a separate and distinct organisational entity within the Department.
 - The establishment of a national public water utility; or establishment of several regional water utilities.

The Act empowers the Minister to direct the Trans-Caledon Tunnel Authority (see below) to undertake specific activities related to its core business of financing major water infrastructure. In this context the Authority is already supporting Umgeni Water's treasury, and is to lead the implementation of the Berg Water Project in the Western Cape.

Institutions for International Water Management

The Minister may, in consultation with Cabinet, establish institutions to implement international agreements in respect of the development and management of shared water resources, and on regional co-operation in water matters. Three existing bodies, the Trans-Caledon Tunnel Authority (RSA-portion of the Lesotho Highlands Water Project), the Komati Basin Water Authority (RSA-Swaziland), and the Vioolsdrift Noordoewer Joint Irrigation Authority (RSA-Namibia), are regarded as international water management bodies in terms of the Act.

Although not established in terms of the Act, structures have been established to further the development and management of international river basins that South Africa shares with neighbouring countries. These bodies include:

- Botswana / RSA Joint Permanent Technical Water Committee
- Lesotho Highlands Water Commission (LHWC)

- Limpopo Basin Permanent Technical Committee (LBPTC)
- Mozambique / RSA Joint Water Commission
- Orange / Senqu River Basin Commission (RSA, Namibia, Lesotho and Botswana)
- Permanent Water Commission (PWC) RSA- Namibia
- Swaziland / RSA Joint Water Commission
- Swaziland / Mozambique / RSA Tripartite Permanent Technical Committee (TPTC)

Water Tribunal

The Water Tribunal was established in October 1998. It is not a water management institution in terms of the Act, but an independent body with a mandate to hear and adjudicate appeals, mainly against administrative decisions made by responsible authorities and water management institutions, on a wide range of water-related issues specified in the Act. The Tribunal will also adjudicate claims for compensation where a user considers that the economic viability of her or his water-using activity has been severely prejudiced by a refusal to grant a licence, or a reduction in water use on granting or reviewing a licence.

The Tribunal has jurisdiction everywhere in the country, and it may hold hearings in the areas where the cause of action arose. The Tribunal's operations are funded from the National Treasury. Procedural rules for the Tribunal are in preparation, and will be published in the Government Gazette when they have been approved by the Minister. A person who is not satisfied with the Tribunal's decision may, on a question of law, appeal against the decision to a High Court.

Members of the Tribunal are: Advocate Maritza Uys (Chair), Mr. Brian Hollingworth (Deputy Chair), Ms Ethney Davey and Mr. Meshack Mabesele. They will serve for a three year term, after which they may be re-appointed.

3.5.3 MONITORING INSTITUTIONAL PERFORMANCE

The Act provides for various formal instruments by which the performance of institutions may be monitored and assessed:

- **Catchment management agencies and water user associations** are required to prepare business plans and annual reports.
- **An institution for international water management** established in terms of the Act is required, unless the particular international agreement provides otherwise, to submit a report each year to the Minister and any other party specified in the international agreement.

3.5.4 RELATIONSHIPS AMONG WATER MANAGEMENT INSTITUTIONS

The institutional relationships based on statutory authority are explicit in the Act, and relate to the Minister's overall authority over all water management institutions. They enable the Minister to empower institutions, and to exercise oversight and control of their activities:

- The Minister empowers institutions by delegating and assigning powers and duties to them.
- The Minister has oversight of the plans and performance of institutions through the submission of business plans, financial strategies and targets, and annual reports for approval.
- The Minister may exercise control over institutions by issuing directives to them on a wide range of matters concerning their performance.

In addition, catchment management agencies may, when empowered to do so, delegate powers and duties to its own committees, and to water user associations.

The vertical, hierarchical authority relationships defined in the Act are not necessarily sufficient to ensure that the institutions will operate successfully. This will depend on all institutions building cooperative and supportive working relationships with each other. The Department will provide support for the CMAs initially in their developmental stages, and subsequently when they are fully established.

In turn, catchment management agencies must establish co-operative relationships with water user associations in their areas; water users, stakeholders and other administrative authorities; provincial government departments and local government.

CHAPTER 3, PART 6: MONITORING AND INFORMATION

3.6.1 INTRODUCTION

To meet the requirement for integrated information the Department is reviewing, and revising where necessary, all data-acquisition, monitoring and information systems. National systems will be designed so that catchment management agencies, when they are established, can take responsibility for information management in their water management areas, as well as have access to information from adjacent areas. The national information system for water services required by the Water Services Act will be linked to information systems for water resources.

The Act requires any person, on the request of the Minister, to provide data and information to facilitate the management and protection of water resources. Regulations may be written in this respect.

3.6.2 MONITORING SYSTEMS

The Act requires the Minister to establish national monitoring systems for water resources to collect appropriate data and information. The Department operates several monitoring systems that collect some of the required data and information. The Department is addressing the shortcomings of the current arrangements by amalgamating all existing and planned monitoring and assessment systems into a structured and coherent monitoring, assessment and information system.

An important component of the monitoring and assessment strategy will be to develop co-operative, collaborative relationships between the Department and other organisations that also operate water-related monitoring, assessment and information systems.

Surface Water - Flow Monitoring

Flow in rivers is monitored at 800 national monitoring stations. To meet international best practice standards 500 additional national monitoring points would be required during the next 20-25 years using present technologies, and the number of meteorological stations increased from 275 to 350.

The number of operational flow-monitoring sites, where flow is measured at reservoirs, in transfer schemes or at major irrigation schemes, would need to be increased from 625 to between 1 500 and 2 000. A review will be undertaken of technological trends in this area, to determine if more cost-effective options are available.

Surface Water - Water Quality Monitoring

Water quality parameters monitored include:

- **Physico-chemical:** The National Chemical Water Quality Monitoring Network comprises approximately 850 monitoring points in rivers and at reservoirs. The size of the network is considered to be adequate.
- **Microbial:** The National Microbial Monitoring Network is operational in eight water management areas.
- **Eutrophication:** The National Eutrophication Monitoring Programme, which includes cyanobacterial surveys, is operational in 50 reservoirs.
- **Biological:** The National River Health Programme operates in all 19 water management areas.
- **Toxicity:** The National Toxic Monitoring Programme is in its planning and design phase.
- **Radioactivity:** The National Radioactivity Monitoring Programme is being tested in three mining areas.
- **Estuaries:** A National Estuarine Monitoring Programme is planned.

The structure and co-ordination of these programmes will be reviewed and prioritised as part of the implementation of the monitoring, assessment and information system.

Groundwater Monitoring

Continuous monitoring of groundwater levels is required at an estimated 460 points for an effective national network (currently 150 points). The intention is to refine and develop the present system at three levels:

- **Nationally** by the Department, in relatively unimpacted areas, to provide background and baseline information, by 2006.
- **In major aquifers** by catchment management agencies, to determine trends in water levels and water quality (physico-chemical only) resulting from human activity.
- **Locally**, through information provided by users, in terms of licence conditions, on groundwater use and on conditions encountered during borehole drilling.

Resources Required for Monitoring

Resources currently available for monitoring are generally inadequate throughout all existing systems. The proposed expansion of monitoring activities, and training water resources management practitioners will require additional resources, and the Department is assessing and quantifying the extent of new resources required as part of its overall implementation planning.

3.6.3 INFORMATION SYSTEMS

The Minister is required by the Act to establish the following national information systems.

Surface Water Hydrology

The Department's existing mainframe-based Hydrological Information System, and several related systems will be replaced with a new server-based commercial system during 2002. It is expected to be operational at all departmental Regional Offices by 2004.

Water Quality

The Department is developing the Water Management System for the operational management of water quality monitoring systems, and storing, processing and disseminating the results arising from monitoring. The Water Management System is currently functional, and operational in the Department's National Office and one Regional Office. The system is expected to be fully operational throughout the Department in 2007.

Groundwater

The present mainframe-based national groundwater database is to be replaced with a server-based, web-enabled National Groundwater Archive. The development of the system, and transfer of all data, is expected to be completed by 2004. The Archive will be linked to a proprietary system that provides management information by modelling groundwater recharge, impacts of abstraction, and impacts of aquifer contamination. The system is expected to be installed in the Department's National Office and three Regional Offices by the end of 2002, and to be fully operational in all Regions by 2004.

Water Use Registration and Authorisation

The Water use Authorisation and Registration Management System (WARMS) is a comprehensive system designed to manage the process of registering water use and the authorisation of water use (by licensing), as well as manage administrative components of the water charge system. The registration component of the system has been in use since 2000. The cost recovery functions became operational early in 2002, with the licensing capabilities to follow in 2003. Links with national databases operated by other departments should be established by 2004.

State of Rivers Reporting

The National River Health Programme intends to produce State of the Rivers Reports for all major river systems in the country by 2008. The reports will indicate the present state of the rivers, whether conditions are stable, deteriorating or improving, what is causing the state of the river to change, and what management interventions are required.

CHAPTER 3, PART 7: PUBLIC SAFETY

3.7.1 INTRODUCTION

Water-related disasters take many forms, and range in the extent of their influences from local to national.

- Floods occur naturally as a result of South Africa's highly variable climate, but they may also be caused by dam failures.
- Droughts can occur at any time, anywhere in the country, and often last for several years.
- Pollution of water resources from spills of hazardous or toxic materials can render water unfit for use, and damage the ecological functioning of the resources. Bacteriological pollution of water resources can cause outbreaks of diseases such as cholera.

3.7.2 NATIONAL DISASTER MANAGEMENT POLICY AND LEGISLATION

The 1999 *White Paper on Disaster Management*, emphasises preparedness, prevention and mitigation. The responsibility for disaster management rests primarily with government, and depends on co-operation among all spheres of government, as well as civil society and the private sector. The policy proposals will be given legal effect when the National Disaster Management Bill (B58-2001), is promulgated as the National Disaster Management Act later in 2002.

This Act will establish the National Disaster Management Centre as the national focal point for all disaster management activities. The Centre will be mandated, among other things, to develop the National Disaster Management Framework.

3.7.3 THE DEPARTMENT'S ROLE IN DISASTER MANAGEMENT

Disaster Management Planning

The Department will be required to prepare a disaster management plan within the National Disaster Management Framework. It must also ensure that disaster management planning is included in catchment management strategies, and the business plans of water user associations, and see to it that provisions for water-related disasters in respect of water services are incorporated into the water services development plans of water services authorities and the business plans of water boards.

Floods

The National Disaster Management Centre has established several working groups, each of which will prepare a component of the National Disaster Management Framework. The Department will lead the working group to develop a national flood management policy. The flood policy will include proposals for guidelines and standards, and institutional responsibilities for:

- The operation of large storage dams, to provide security of water supply and protection for downstream areas;
- The safe and sustainable use of the floodplains of rivers;
- The design of services infrastructure situated on or adjacent to rivers, to optimise the balance between affordability and the need for structural robustness to resist damage during floods.
- Effective flood warning systems for all flood-prone areas, combined with education, training and awareness creation programmes, and
- Co-operative relationships with neighbouring countries with whom South Africa shares river systems.

Dam Safety

The Dam Safety Office, based in the Department, administers the Act's provisions relating to the safety of all new and existing dams with a safety risk. These provisions are intended to ensure that such dams are designed, constructed, operated and maintained by approved professional persons to minimise the risk of loss of life or damage to property caused by dam failure or operational shortcomings. All dams with a safety risk must be registered with the Department.

All dam owners (including the Department) are required to have their dams regularly inspected by an approved professional person, and to make any necessary repairs or alterations to ensure the safety of the dam. Each dam owner is also required to prepare an emergency preparedness plan detailing the actions to be taken in the event of an actual or imminent dam failure, or any other emergency situation relating to the dam.

The Department is preparing new regulations relating to the safety of dams. The drafting process is expected to be completed during 2002, after which the proposed regulations will be the subject of a public consultation process.

Droughts

The Department will co-operate with the National Department of Agriculture, which leads the drought working group established by the National Disaster Management Centre, in developing prevention and mitigation measures for drought conditions.

From a water resources perspective drought management is concerned mainly with mitigating the effects of prolonged periods of lower-than-average runoff in streams and rivers by providing water from storage dams. However, because the duration of droughts cannot be predicted with any certainty, water in storage dams must be used judiciously, and it may be necessary to impose restrictions on water use when there are indications that drought conditions are imminent. Where restrictions are necessary, water to meet basic human needs will always receive priority in allocations, followed by strategically important uses. In general, the availability of water for irrigation is restricted first.

Pollution of Water Resources

The Department's approach to water quality management is, as far as possible, to promote the reduction of discharges of waste or water containing waste into water resources. In emergency situations, where harmful substances are accidentally or negligently discharged into water resources, the Act makes those who have caused the pollution responsible for remedying its effects. At present all pollution incidents must be reported to the Department, so that appropriate departmental responses can be coordinated with the relevant emergency services and disaster management centres.

Pollution from diffuse sources such as informal settlements is extremely difficult to control at source, and inadequate sanitation facilities in these areas can result in bacterial pollution of water resources, which may cause outbreaks of diseases such as cholera. The National Disaster Management Centre has co-ordinated the development of an inter-departmental strategy to deal with cholera, which provides the framework for dealing with outbreaks of disease.

Information for Disaster Management

The timely availability of relevant information about potential, imminent or actual hazards is an essential requirement for institutional and public preparedness for disaster situations. Two specific requirements of the NWA in this regard are:-

- Section 144 requires township developers to indicate the 100 year flood lines on their plans; and
- Section 145 requires all water management institutions to make information available to everyone who might be affected by water-related incidents and events.

With regard to general information for the mitigation and prevention of disasters:

- Strategic monitoring sites to transmit data in as near real-time as possible to the Department's information systems are required for rapid-onset events such as floods, dam breaks and pollution incidents. The Department will strengthen its capacity to analyse the data, and distribute it to communities threatened by the event.
- The Department will work closely with the National Disaster Management Centre, the South African Weather Services and the Agricultural Research Centre to ensure that adequate rainfall data continues to be available to water resources and disaster managers.
- Water quality monitoring networks will be improved in order to detect contamination by pollutants, and to ensure that relevant information is rapidly available to those at risk.

As part of its work with the National Disaster Management Centre the Department is leading the development of a disaster vulnerability atlas, which will capture and display all relevant information required to support decision making in emergencies and disaster situations.

Departmental Public Safety Unit

The Department is investigating the establishment of a dedicated public safety unit to deal with its water resources management, water services and forestry responsibilities relating to disasters and emergencies.

CHAPTER 3, PART 8: ANTICIPATED PROGRAMME OF IMPLEMENTATION ACTIVITIES

(Read with Part 9)

3.8.1 INTRODUCTION

A multi-year programme will be undertaken to implement the National Water Act. Given the size and complexity of many of the activities described, the proposed programme is indicative, and not a rigid master plan. The programme will be reviewed in the light of experience gained during the (maximum five year) currency of the First Edition NWRS.

3.8.2 OPERATIONAL ACTIVITIES

Routine operational activities such as operating and maintaining bulk water supply systems, controlling water use, collecting water-related information, and dam safety control will be undertaken as long as the NWA remains in force, and no programmes are presented for them.

Commissioning and establishment activities have finite (although in some cases, rather long) durations. They are:

- Compulsory licensing (including determination of resource directed measures);
- Establishing catchment management agencies;
- Delegating operational responsibility for physical infrastructure, and transferring the ownership of infrastructure to water management institutions;
- Establishing new water user associations; and
- Expanding existing monitoring networks and information systems, and establishing new ones.

Compulsory Licensing

The country has been divided into approximately 100 significant surface and groundwater resources for the purposes of compulsory licensing. Figure 3.2, page 28, indicates the proposed programme of implementation for compulsory licensing. The Mhlathuze catchment, in WMA 6 - Usutu to Mhlathuze, has been selected as the pilot catchment.

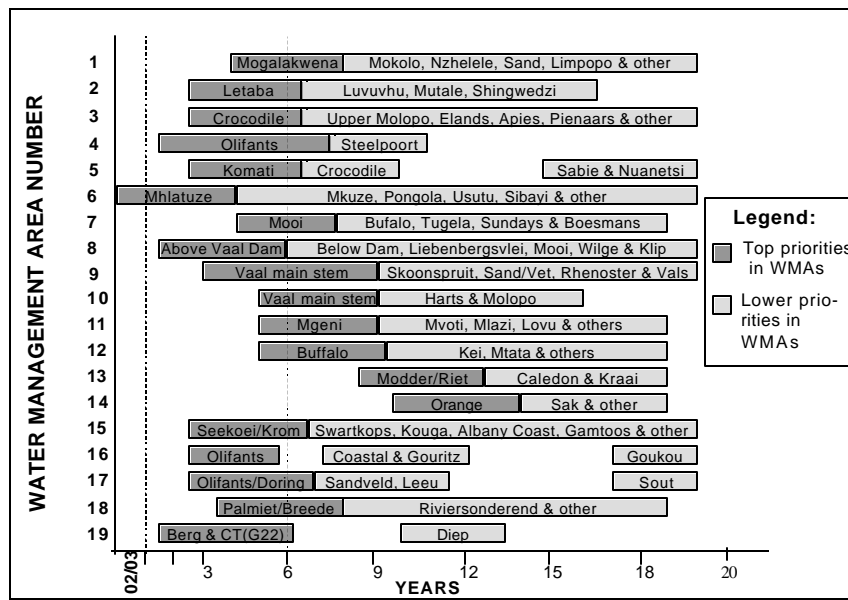


Figure 3.2: Proposed programme for compulsory licensing.

Establishment of Catchment Management Agencies

The timing for the establishment of CMAs is presented in Figure 3.3. Five water management areas have been identified for which catchment management agency establishment is urgent. These are the Inkomati, Olifants, Breede, Crocodile West & Marico, and Mvoti to Mzimkulu. Depending on the complexity of the water management area, a period of two to three years has been allowed for the process of establishing the agency and appointing the Governing Board. A further five years has been allowed for developing and establishing the executive structure of the agency.

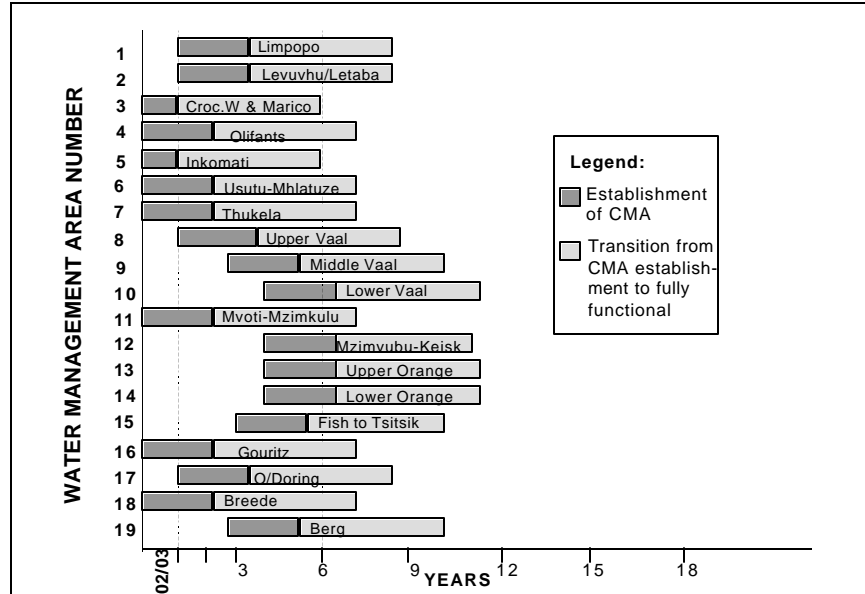


Figure 3.3: Proposed programme for establishing catchment management agencies

Delegation of Functions and Transferring Infrastructure to Water Management Institutions

The policy on the transfer of ownership of existing State-owned and operated infrastructure is being developed. The optimal institutional arrangements for the development of new water resources infrastructure in general, and the development and management of schemes which include dams in particular, is also under investigation. At this stage the programme in Figure 3.4 provides information only on the proposed transfer of operation and maintenance responsibilities for irrigation schemes with distribution infrastructure to water user associations.

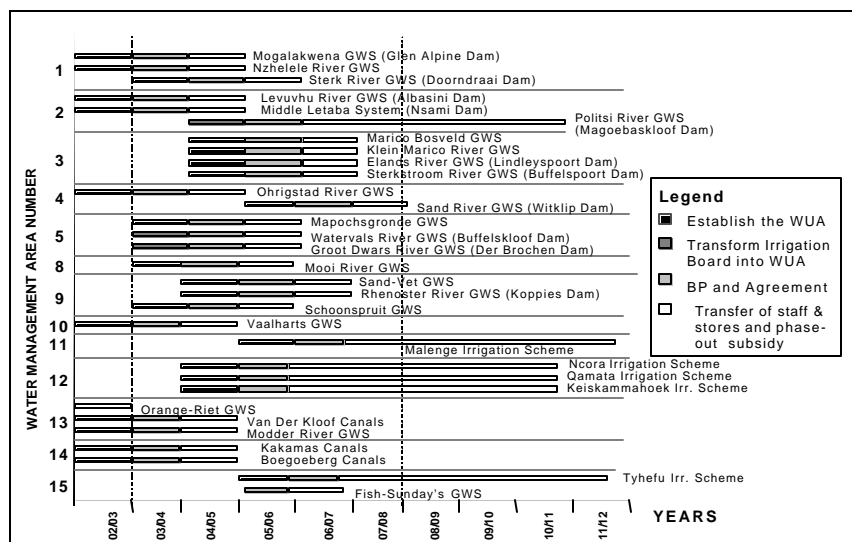


Figure 3.4: Proposed programme for delegating operation and maintenance functions to water user associations

Three other commissioning activities - implementing revenue collection for water resource management charges, completing the transformation of irrigation boards into water user associations, and streamlining the licence application process - are scheduled to be completed within two years.

3.8.3 DEVELOPMENT OF INTERNATIONAL WATER-SHARING AGREEMENTS

A programme for the establishment of international institutions, the completion of basin studies, and establishment of water sharing agreements is presented in Table 3.1.

Table 3.1: Indicative programme for international water sharing agreements

WATERCOURSE	NEIGHBOURING COUNTRIES SHARING THE WATERCOURSE	PROGRAMME FOR STUDIES AND AGREEMENTS	DATE
Orange	Botswana Lesotho Namibia	• (Orange - Senqu Basin Commission established)	2000
		• Lower Orange River Management Study (RSA/ Namibia)	Mid-2003
		• Lesotho Highlands Water Project Further Phases Pre-Commitment Study	2004
		• Feasibility Study for the sustainable development of Molopo - Nossob Watercourse	2004
		• Integrated water resources management plan for Orange-Senqu Basin	2005
Limpopo	Botswana Mozambique Zimbabwe	• Treaty to establish the Limpopo River Commission	2003
		• Limpopo Basin Study	2004
Inkomati	Mozambique Swaziland	• Joint Inkomati Basin Study completed	2002
		• Interim Agreement	2002
		• Inkomati River Commission Agreement	2004
		• Comprehensive Agreement	2009
Maputo	Mozambique Swaziland	• Interim Agreement	2002
		• Maputo River Commission Agreement	2004
		• Maputo River Basin Study	2005
		• Comprehensive Agreement	2010

3.8.4 DEVELOPMENT OF PHYSICAL INFRASTRUCTURE

The Department has investigated the necessity for the construction of several major government waterworks comprising dams and, where necessary, associated infrastructure such as pumping stations, pipelines and canals, to meet projected future needs for water. These schemes are listed in Tables 3.2 and 3.3. The following should be noted:

- Inclusion of a scheme as a possible development does not constitute a commitment to proceed with the scheme.

- In general, only schemes that are projected to be required during the next 25 years are mentioned.
- The preferred options are listed. (Where relevant, alternative options investigated are indicated in the full NWRS).
- The identification of the need for a scheme, and the selection of the most appropriate option, will eventually be undertaken through the development of a catchment management strategy for schemes which impact only at catchment level or within a single water management area.

Two other important schemes have been investigated, but are not included in Table 3.3 because demand scenarios indicate that supply augmentation is unlikely to be required during the 25 year planning period. They are:-

- The Thukela Water Project, which has been investigated to transfer 510 million cubic metres of water a year from the Thukela River to the Vaal River System to meet increasing urban and industrial uses in Gauteng and surrounding areas. Possible alternatives are transfers from the proposed Mashaai Dam in Lesotho, or from the proposed Boskraai Dam in the Upper Orange water management area.
- The Thukela-Mhlathuze Transfer scheme, which could transfer a maximum of an additional 54 million cubic metres a year from the Thukela River into the Mhlathuze water management area for possible mining and industrial developments at Richards Bay and surrounding areas.

Table 3.2: Possible future large scale water resource developments, primarily for irrigation purposes

WMA	Name of Dam / Scheme	River	Province	Use	Possible Completion Date	Additional Yield (mill m ³ /a)
2	Tzaneen Dam raising and nWamitwa Dam	Letaba	Limpopo	Irrigation, domestic	2007	50
6	Embiance Dam	Black Mfolozi	KwaZulu-Natal	Irrigation, domestic	2009	10
14	Vioolsdrif Dam	Orange	Northern Cape	Irrigation, improved operation of Orange River System.	2012	150
17	Clanwilliam Dam raising	Olifants	Western Cape	Irrigation	2009	10
17	Melkboom Dam	Doring	Western Cape	Irrigation	2011	121

Table 3.3: Possible future large scale water resource developments, primarily for domestic, urban, industrial or mining purposes

WMA	Name of Dam / Scheme	River	Province	Use	Possible Completion Date	Additional Yield (mill m ³ /a)
4	Flag Boshielo Dam raising	Olifants	Mpumalanga	Mining, urban, industrial in Olifants and Limpopo WMAs	2005	16
4	Rooipoort Dam	Olifants	Limpopo	Mining, domestic (urban and rural)	2010	77
4	De Hoop Dam	Steelpoort	Mpumalanga	Mining, domestic	2008	87
5	Mountain View Dam	Kaap	Mpumalanga	Domestic, irrigation	2012	64
5	Boekenhoutrand	Komati	Mpumalanga	Power generation, irrigation.	2012	50
7	Springgrove Dam and aqueduct	Mooi	KwaZulu-Natal	Transfer to Umgeni system. Urban, industrial.	2010	88
8	Klip River Dam	Klip River	Free State / Mpumalanga	Urban, industrial, power generation	2009	50
11	iSithundu	Mvoti	KwaZulu-Natal	Multi-purpose	2008	47
16	Grobbelaars	Grobbelaars	Western Cape	Urban, Industrial	2010	5
19	Skuifraam Dam and Supplement	Berg	Western Cape	Urban, Industrial	2008	81
19	Voelvlei Dam Augmentation	Berg	Western Cape	Urban, Industrial	2015	30

CHAPTER 3, PART 9: FINANCIAL IMPLICATIONS

(Read with Part 8)

3.9.1 INTRODUCTION

This Part summarises the financial implications of the main activities required to implement the Act's provisions, and indicates sources of funding. All costs and revenues are in 2002 Rands.

3.9.2 OPERATING COSTS

Operating costs include:

- **Routine Operational Activities** - Total estimated annual funding requirements for routine operational activities are R 1600 million for financial year 2002/3; and approximately R 1 800 million for the years thereafter.
- **Commissioning / Establishment Activities** - Over the next 15 years, the estimated cost of the commissioning activities is expected to be approximately R 1 500 million: that is, R 100 million per year on average.

3.9.3 CAPITAL COSTS

Capital costs include:

- **New government waterworks** - Indicative costs for constructing the major schemes described in Part 8 of this Chapter are presented in Table 3.4. Approximately R 11 916 million may be required for the development of major new government waterworks during the next 25 years, including provision for the augmentation of the Vaal River system, and investment to support development in Richards Bay, which may have to be initiated during the next 25 years.
- **Expansion of National Monitoring Networks** - The capital expenditure required may be up to R 1 300 million over the next 20-25 years.
- **Refurbishment of existing government waterworks and other capital expenditure** - Capital will also be required for refurbishment works on existing government water schemes, redemption of loans, transfer payments and movable assets. The allocation for the current (2002/03) financial year for these purposes is R 534 million, and it is anticipated that at least this amount will be needed for this purpose in future years.

Table 3.4: Indicative costs of major government water schemes

WMA	Name of Dam / Scheme	River	Indicative Cost (R million)
Schemes primarily for irrigation purposes			
2	Tzaneen Dam raising and nWamitwa Dam	Letaba	693
6	Embiana Dam	Black Mfolozi	101
14	Violsdrif Dam	Orange	165
17	Clanwilliam Dam raising	Olifants	50
17	Melkboom Dam	Doring	769
Sub-total			1 778
Schemes primarily for domestic, urban, industrial or mining purposes			
4	Flag Boshielo Dam raising	Olifants	142
4	Rooipoort Dam	Olifants	510
4	De Hoop Dam	Steelpoort	213
5	Mountain View Dam	Kaap	360
5	Boekenhoutrand	Komati	652
7/6	Thukela-Mhlathuze Transfer	Thukela/Mhlathuze	320
7	Thukela Water Project	Thukela	5 567
7	Springgrove Dam and aqueduct	Mooi	140
8	Klip River Dam	Klip River	350
11	iSithundu	Mvoti	440
16	Grobbelaars	Grobbelaars	31
19	Skuifraam Dam and Supplement	Berg	1 188
19	Voelvllei Dam Augmentation	Berg	225
Sub-total			10 138
Total			11 916

3.9.4 EXISTING FUNDING

The Department's activities are mainly funded from two sources: allocations from the government Exchequer Account, and revenue from the sales of water under the Water Trading Account. The Department also enjoys some international donor funding.

The projected expenditures and revenues for the water resources management components of the Trading Account are:

- Integrated Catchment Management: R 209 million and R 59 million - a projected deficit of R 150 million.
- Integrated Systems: R 1 354 million and R 1 597 million - a projected surplus of R 243 million.
- Bulk Water Supply: R 340 million and R 166 million - a projected deficit of R 174 million.

The Department will continue to operate the Water Trading Account until water management institutions are empowered to collect revenue from water user charges made in terms of the pricing strategy.

3.9.5 FUTURE FUNDING ARRANGEMENTS

Operational Activities

Although water use charges will increase revenue, allocations from National Treasury will continue to be necessary for a number of years, to support the costs of commissioning activities.

The duration and extent of continuing financial support for water management institutions will be clarified when the Department has completed its analysis of the full financial implications of the new institutional arrangements.

The objective is to implement the strategy without substantial additional exchequer funding.

Infrastructure Development

If a water utility is established, much of the proposed infrastructure development could be funded off-budget, depending on the detailed establishment arrangements.

Some government funding may continue to be required for developing schemes intended primarily for irrigation purposes, schemes for social, disaster mitigation or environmental purpose, or schemes to meet international obligations. Exchequer funding will also be required for the capital costs of expanding the monitoring network.

If the Department retains the responsibility for infrastructure development, this will have to be funded from the Exchequer.

3.9.6 CONCLUSION

It appears that the NWA can be implemented within the existing financial framework, but considerable uncertainty remains. The size of the Exchequer allocation will depend on levels of payment for water and on the Department being allowed to retain existing Exchequer allocations and revenue from water use charges to finance commissioning/establishment activities.

The initial review suggests that the required capital expenditure, averaging approximately R 534 million a year, could be required. Much of this could be funded off-budget if certain institutional restructuring is implemented. Should this not be done, Exchequer allocations for major capital investments may have to be increased.

CHAPTER 4 COMPLEMENTARY STRATEGIES

4.1 INTRODUCTION

This Chapter gives brief descriptions of strategies and activities that are not specifically required by the Act, but which are nonetheless essential for its long-term, sustained implementation.

4.2 CAPACITY BUILDING IN THE WATER SECTOR

It is recognised that South Africa's human resources are presently insufficient to implement all of the Act's provisions at once. It is necessary to ensure that steps are taken to build sufficient capacity in the water sector to implement, and sustain the implementation of water policy and legislation.

An important development in this respect is the recent establishment of a Water Sector Capacity Building Strategy Task Team, in which the Department is playing a prominent role. The capacity building strategy has the objective of ensuring that, in an achievable time (15 years) the necessary capacity will exist in all relevant institutions to fully implement water-related policy and law. The strategy will be consistent with capacity building initiatives in other sectors of society via the legislative, institutional and financial framework provided by the South African Qualifications Authority Act, 1995, the Skills Development Act, 1998, and the Skills Development Levies Act, 1999.

In line with the general requirement for national social and economic transformation, all capacity building initiatives must address representivity in terms of race, gender and disability in all water sector institutions. Since 1994 there has been particular emphasis in the Department's bursary policy, by which students are assisted with their studies in selected fields, on achieving improved representivity in the technical disciplines. Development of high-level skills of post-graduate students is also supported by the Water Research Commission (see below).

4.3 EDUCATION AND AWARENESS CREATION

Public Consultation

The Department has undertaken public consultation exercises on issues such as the establishment of water management areas, the pricing strategy, Reserve determinations, and the establishment of catchment management agencies. The Department is aware of the danger of stakeholders becoming overloaded with the number and complexity of issues on which they are consulted. The intention is to create several representative stakeholder groups in each water management area, and use them as the focus for consultation exercises. The principle objective is to ensure that everyone who wishes to contribute to the development and implementation of water management strategies is given the opportunity to do so.

The Department has developed guidelines for public participation in water matters, to ensure a consistent approach throughout the country. It is expected that all water management institutions will adopt these guidelines for their consultative processes.

The Water Education Programme

This programme (formally the 20/20 Vision for Water Programme) aims to raise awareness among South Africans of water as a scarce and precious resource, and to develop responsible attitudes towards its use and conservation. It is the biggest environmental education project ever undertaken in South Africa and so far has reached more than 10 000 schools. It plans to expand its activities to tertiary learning institutions. The programme works closely with the provincial education and environmental authorities to ensure consistency and integration with the outcomes based education system.

Communications

In addition to the NWA-specific consultation exercises described above, the Department will continue to run an extensive communications programme, which is intended to provide the public with information about the Minister's and the Department's activities, to gather information from the public about water- and forestry-related concerns, and to receive feedback from the public about the Department's performance in undertaking its mandates.

Other important sources of information about the Department's intentions and achievements are the three year Strategic Plan and the Annual Report, both prepared and published annually in accordance with the requirements of the Public Finance Management Act, 1999

4.4 WATER RESEARCH

Research has been fundamental to the creation of knowledge about and understanding of water resources, and for the development of many of the techniques and tools used for their management. New challenges in the water field arise continually, requiring new understanding and new tools and techniques.

The Water Research Commission (WRC), a statutory body funded from a levy on water use, is the principal leader and co-ordinator of water-related research and development in South Africa. The Commission maintains close ties with the Department and there are regular co-ordination meetings between the two organisations, in order to ensure that the Department's research needs are known. There is also co-ordination between the Department, the Water Research Commission and the Department of Arts, Culture, Science and Technology, to ensure that approaches are consistent with broad science and innovation policy.

The WRC's approach is founded on five inter-related Key Strategic Areas (KSA) of research, which are jointly intended to address the fundamental requirements of the NWA, including:

- *Water resources management*, which will consider issues of equity and sustainability in managing water resources;
- *Water-linked ecosystems*, which will address the protection of water resources;
- *Water use (industrial and domestic) and waste management*;
- *Sustainable water use for agriculture*;
- *Knowledge management*, which will address the mechanisms to ensure that research results and products are effectively disseminated to water resources managers and other prospective users.

Involvement in research is recognised as an important vehicle for building and developing expertise among water resource practitioners. Every research project will be required to have a strong element of capacity-building, especially in historically disadvantaged institutions and among previously disadvantaged individuals.

A review will be undertaken of the legislation governing the Water Research Commission, to ensure consistency with the Public Finance Management Act, as well as the evolving framework for the governance of public institutions.

CHAPTER 5 NATIONAL PLANNING AND CO-ORDINATION, AND INTERNATIONAL CO-OPERATION IN WATER MANAGEMENT

5.1 INTRODUCTION

The Department, in accordance with the Constitution, is committed to co-operating with all spheres of government to achieve the national objectives of equitable and sustainable social and economic development. The Act requires that the Department's strategies and institutional arrangements for water resources management are within the framework of existing relevant government policy.

5.2 THE FRAMEWORK OF EXISTING RELEVANT GOVERNMENT POLICY

The Department has examined a number of national policies and laws to determine the extent to which the strategies, objectives, plans, guidelines and procedures, and institutional arrangements proposed in the NWRS are in harmony with existing relevant government policy.

It was concluded that there were no fundamental conflicts between the Strategy's proposals for implementing the provisions of the NWA and the policies and laws examined, except that policy, legislation and development planning do not always take account of the availability of water, and assume that water can always be made available for any development initiative.

5.3 SPECIFIC REQUIREMENTS OF OTHER NATIONAL LEGISLATION

There are several national laws that make specific requirements of the Department, and other water management institutions, in carrying out their mandates in respect of water resources management.

The Water Services Act, 1997 (No. 108 of 1997)

Co-ordination is required between and within water management and water services institutions in the development of strategy and planning, water use regulation, implementation, institutional support and information management and communications.

There are also specific requirements in the NWA for water resources management activities to support the provision of water services.

- The Act requires catchment management strategies to take account of the water services development plans prepared by water services authorities in terms of the Water Services Act. These plans form part of the Integrated Development Plans that local authorities must prepare in terms of the Municipal Systems Act, 2000 (No. 32 of 2000).
- The NWA requires the strategies in the NWRS to support the achievement of compulsory national standards prescribed under the Water Services Act. For example: basic sanitation; basic water supply; quality of potable water; control of objectionable substances; disposal of grey water; the use of effluent; quantity and quality of industrial effluent discharged into sewerage systems; water services audits; water and effluent balance analysis and

determination of water losses; repair of leaks; measurement or control of water supplied; pressure in reticulation system; and reporting of non-compliance.

- The NWA requires the pricing strategy for water use charges to support the establishment of tariffs by water services authorities.

Environmental Legislation

Water resources management is subject to the requirements of national environmental legislation, that is, the National Environmental Management Act, 1998 (No. 107 of 1998) (NEMA) and those parts of the Environment Conservation Act, 1989, (No. 73 of 1989) (ECA) which have not yet been repealed by NEMA.

- In terms of NEMA, DWAF has published a Consolidated Environmental Implementation and Management Plan (CEIMP) that describes the Department's functions, policies, plans and programmes, as well as existing and proposed co-operative arrangements with other departments in all spheres of government to ensure their compliance with water-related policy and legislation.
- In its CEIMP, the Department has committed itself to developing and implementing an integrated environmental management framework, to ensure that its approach to environmental issues is aligned with the national environmental principles described in NEMA.
- DWAF will prepare regular State of Water Resources Reports, which will build on the State of Rivers reports by the River Health Programme. The reports will describe progress in achieving the environmental objectives of the NWA, and indicate areas where new interventions or intensified efforts are required. They will make inputs to national environmental reporting by DEAT.
- The Department, by agreement with DEAT, has the mandate in terms of section 20 of the ECA to oversee the management of waste disposal onto land.

National Disaster Management Legislation

The Department's obligations in terms of the new National Disaster Management Act, expected to be promulgated during the latter part of 2002, include:

- Supporting the Minister's participation in the Inter-Governmental Committee on Disaster Management;
- Representation on the National Disaster Management Advisory Forum.
- Contributions to the development of the National Disaster Management Framework
- Providing relevant information to the National Disaster Management Centre's information system.
- Preparing a departmental disaster management plan for water-related matters.
- Representing, or co-ordinating the representation of the water sector on forums to identify disaster-related priorities
- Ensuring interaction with neighbouring countries where basins are shared internationally.

Public Finance Management Act (No. 29 of 1999) (PFMA)

The Department is subject to all relevant provisions of the PFMA. The Department will clarify, in discussions with National Treasury, the extent to which catchment management agencies and water user associations will be subject to the requirements of the PFMA.

Promotion of Access to Information Act (No. 3 of 2000) (PAIA)

The Department has responsibilities under the NWA to make water-related information available to the public, particularly in respect of actual or potential disasters and emergency situations. The PAIA gives effect to the constitutional right of access to any information held by the Department that is required for the protection of any rights. All relevant provisions of the PAIA will apply to catchment management agencies and water user associations.

Promotion of Administrative Justice Act (No. 2 of 2000) (PAJA)

The NWA provides rights of appeal to the Water Tribunal, but the matters on which an appeal can be made are limited to those specified in the Act. The PAJA applies to all administrative actions, and reinforces the necessity for water resource managers to apply their minds to every aspect of the decision-making process, and to ensure that deliberations take every relevant aspect into consideration. All relevant provisions of the PAJA will apply to catchment management agencies and water user associations.

5.4 INTER-GOVERNMENTAL PLANNING

The three spheres of government must co-operate with each other and share information to ensure the delivery of services. Figure 5.1, page 36, outlines the links between plans and strategies for water management and other national, provincial, municipal and sectoral plans and strategies.

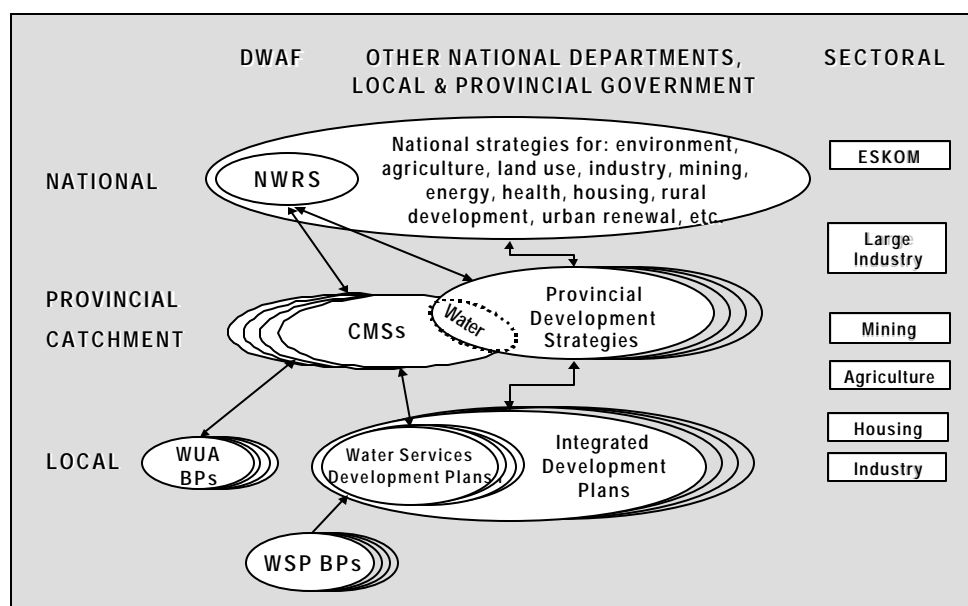


Figure 5.1: Water-related planning in the national planning framework

CMS - Catchment management strategy; WUA - Water user association; WSP - Water services provider; BP - Business plan

5.5 NATIONAL PROGRAMMES

The Department is co-operating with other departments to ensure that the management of water resources can contribute to the Integrated Rural Development Programme and the Urban Renewal Strategy, with particularly emphasis on interventions to eradicate poverty.

Integrated Rural Development Programme

Interventions include:-

- Modifying water resources management programmes and priorities, if necessary, to account for the priority areas identified for the Programme.
- Ensuring that rural development features strongly in catchment management strategies.
- Identifying rural water needs and opportunities, and making specific allowances for rural development and livelihoods in re-allocating water by compulsory licensing. In particular, identifying potential rural users, in addition to registered users, in calling for licence applications during compulsory licensing.
- Ensuring community representation on the management bodies of water management institutions.
- Ensuring that communications, awareness creation and education programmes are appropriate for rural communities.

Urban Renewal Strategy

Interventions include:-

- Contributing to the planning and development of urban river floodplains to ensure public safety, and the safety of infrastructure, during floods.
- Contributing to the health of urban rivers as social amenities by, among other things, ensuring compliance with conditions for licences to discharge waste into them.
- Supporting public awareness campaigns on the value of urban rivers as social amenities, and assisting with cleaning campaigns.

5.6 INTERNATIONAL COOPERATION IN WATER MATTERS

South Africa interacts on water issues with a number of countries both within and beyond Africa on a variety of issues, ranging from negotiating agreements for water sharing in international river basins with immediately-neighbouring countries, to arrangements for sharing technical information and other resources with developing and developed countries.

Water Sharing Arrangements with Immediate Neighbours

The NWA is one of the few national water laws in the world that makes specific provisions in water allocations for meeting the needs of neighbouring countries with which watercourses are shared. Several bi-lateral and multi-lateral commissions and committees have been established between South Africa and its immediate neighbours, as forums for discussing co-operative arrangements for the utilisation and development of shared water resources (see Chapter 3, Part 5). All technical agreements on water sharing must be politically ratified in each State, with a view to establishing a formal international agreement.

Co-operation in the Southern African Region

Co-operation in water matters in southern Africa takes place within the framework of the Protocol on Shared Watercourses in the Southern African Development Community. Activities relating to the implementation of the SADC Protocol are coordinated by the SADC Water Sector, which is led by Lesotho. The Water Sector has developed a Regional Strategic Action Plan for managing and developing the water resources of the region, and is in the process of initiating a number of projects which, when they are implemented, will give substance to the Protocol's provisions.

Other International Relationships and Interactions

In addition to its relationships with its southern African neighbours, South Africa is interacting with several African countries outside the SADC region, and with countries elsewhere in the world, to explore mutually-beneficial partnerships in water management matters.

In this respect, at present, a number of engineers and geohydrologists from Cuba, and water resources managers from Ruanda are working with the Department. Reciprocal exchanges of information are taking place with China and Tanzania, and the possibility of similar arrangements is being explored with Egypt, Mexico and Russia. Water-related discussions take place under the umbrellas of the Bi-National Commissions that have been established with Algeria, Nigeria and the United States of America.

International Donor Support

The Department has enjoyed considerable overseas development assistance - financial and in-kind - from a number of countries for water resources management, water services and forestry initiatives and projects, and will continue to seek assistance from other countries. In future it is expected that donor support will focus particularly on supporting projects of regional significance.
