PART 2: STRATEGIES FOR WATER RESOURCES MANAGEMENT IN THE MZIMVUBU TO MBASHE ISP AREA

FORMAT OF THE STRATEGY TABLES

DEVELOPED STRATEGIES FOR ISP AREA

The strategies for the Mzimvubu to Mbashe ISP area have been formulated based on the main strategies and complementary strategies in the National Water Resource Strategy. Specific strategies for the ISP area have been developed under the relevant main strategies. In these strategies the issues and concerns affecting water resource management in each of the key areas of the Mzimvubu to Mbashe ISP area are described and the management actions required also highlighted. The following strategies were found to be relevant for the Mzimvubu to Mbashe ISP area:

Strategy No 1 Resources Balance and Reconciliation Strategies

1.1 Water Resource Availability, Use and Reconciliation for the Mzimvubu key area (T30)

1.2 Water Resource Availability, Use and Reconciliation for the Pondoland key area (T60)

1.3 Water Resource Availability , Use and Reconciliation for the Mtata key area (T20,T70 & T80)

1.4 Water Resource Availability Use and Reconciliation for the Mbashe key area (T10 & T90)

1.5 Groundwater Resource Availability and Use in the Mzimvubu to Mbashe ISP Area

1.6 Water Supply to Local Authorities

Strategy No 2 Water Resources Protection Strategies

2.1 Reserve and Resource Quality Objectives

2.2 Water Quality Management and Pollution Control

Strategy No 3 Water Use Management Strategies

3.1 Schedule 1 Use and General Authorisation

3.2 Implementing SFRA : Foresty Management

3.3 Water use for power generation in the Mtata and Mbashe key areas

Strategy No 4 Water Conservation and Water Demand Management Strategies

4.1 Managing Water Demand in the Water Serices Institutions

4.2 Managing Water Demand in the Irrigation sector

Strategy No 5: Institutional Strengthening and Support

Strategy No 6: Social and Environmental

6.1 Poverty eradication, emerging farmers and revitalising of irrigation schemes

Strategy No 7: Integration and Co-operative Governance

Strategy No 8: Monitoring and Information Management

8.1: Monitoring Networks and data capture

8.2: Information management

The motivation for each of the identified strategies is described in the preamble to the strategies.

ASPECTS ADDRESSED UNDER EACH STRATEGY

The following layout is reflected in each strategy table:

- Management Objective: An understanding of where DWAF wants to be after strategy formulation and implementation.
- Situation Assessment: The management objective of each strategy provides the platform from which to launch an assessment and analysis of issues. This involves identifying, analysing and ranking major water resource issues affecting the key area under discussion. This also examines the physical aspects and wide variety of factors that influence the management of the water resources. This forms the basic platform upon which strategies are formulated.
- Strategic Approach: The intention of this section in the table is to strike a balance between the ideal and the practical choices available to address the issues, which have arisen. This includes developing options and analysing them as far as possible. Based on the situation assessment and a consideration of the ISP area in the light of regional and national water resource objectives, management responsibilities and the approach towards meeting these objectives are recommended. This is intended to offer direction and support to managers in making the decisions required to implement the NWA. The nature of future management actions is guided by the strategic approach.
- Management Actions: In this section of the strategy table, the required activities or work packages to achieve the objective, and the responsible authority, are identified and discussed.

STRATEGY NO 1: WATER BALANCE AND RECONCILIATION STRATEGIES

THE NEED FOR WATER BALANCE AND RECONCILIATION STRATEGIES

The Mzimvubu to Mbashe ISP area is one of the few areas in the country where there is an abundance of water. The ISP area is further characterised by the fact that there is widespread and deep poverty, compared to the rest of the Mzimvubu to Keiskamma Water Management Area (WMA12). The indicators such as literacy levels, unemployment and lack of access to basic and social services confirm this fact. The catchments are deeply rural and there is an urgent need to utilise the surplus water productively and in a sustainable manner to ensure that sustainable livelihoods programmes are developed to meet the socio-economic needs through equitable and fair allocation of the available water.

Water balance and reconciliation strategies address the need to:

- Clarify uncertainties and information gaps regarding the availability of surface water and groundwater.
- Investigate the current water allocations for Eskom, including obtaining more accurate information on the environmental Reserve requirements.
- Determine and implement water reconciliation strategies for specific systems, geographical areas or water sectors.
- Implement compulsory licensing. This is not at present a requirement in this ISP area.

Relevant Identified Strategies

The following specific strategies have been developed:

1.1 Water Resource Availability, Use and Reconciliation for the Mzimvubu Key area
1.2 Water Resource Availability, Use and Reconciliation for the Pondoland Key area
1.3 Water Resource Availability, Use and Reconciliation for the Mtata Key area
1.4 Water Resource Availability, Use and Reconciliation for the Mbashe Key area
1.5 Groundwater Resource Availability and Use in the ISP Area
1.6 Water Supply to Local Authorities

Strategy No 1.1

WATER RESOURCE AVAILABILITY, USE AND RECONCILIATION FOR THE MZIMVUBU KEY AREA (T30)

MANAGEMENT OBJECTIVE

To ensure that the water resources of the Mzimvubu key area, which has very limited storage, are utilised optimally whilst ensuring that the ecological Reserve requirements are met.

SITUATION

A water balance for these catchments and a tabulation of use by the different sectors is provided in Part 1, Chapter 5 of this document. The water requirements of the Mzimvubu catchment are considerably less than the available resource, even after allowing for the ecological Reserve, with the result that there are large surpluses available in this catchment. This is hardly surprising given that the Mzimvubu is South Africa's largest unregulated river with a naturalised MAR of 2 897 million m^3/annum. There are no major dams in this key area but a number of farm dams on the smaller tributaries of the tributaries of the Mzimvubu River. The total surplus for this key area is 50 million m^3 at the year 2000 level of development. Most of this water is from run-of–river yield and is in the lower catchments of the area. There are local deficits experienced in the upper catchments (i.e. T33A–E, T34E, F and T31A-G). These are catchments where commercial forestry takes place.

Consumptive water use in the Mzimvubu key area is fairly limited, with the largest consumptive water user being the irrigation sector, using an estimated 15 million m^3/annum. Most of the irrigation is situated in the Kokstad, Matatiele and Maluti areas.

Rural and urban water requirements make up another 15 million m^3/a. Water shortages are reported in the towns of Kokstad and Mt Fletcher. This is not due to a lack of water resources *per se* but rather due to a lack of infrastructure. The shortage of water in Kokstad due to the construction of the large new prison and the migration of people from the rural areas seeking employment were recently addressed with the construction of an augmentation scheme from the Crystal Springs Dam. The augmentation is for a short to medium term growth in demand. However the yield of the Crystal Springs Dam cannot meet the future water requirements of the town. Additional sources of supply will be required sometime in the future.

There are substantial afforested areas in the Mzimvubu key area, estimated at 73 000 ha, which reduces runoff by an estimated 80 million m^3/annum. The impact of this on the available yield was estimated in the calculation done for this ISP at 11 million m^3/a (refer to Forestry Management, section 9.3).

The water resources of the Mzimvubu key area were last investigated as part of the VAPS Study, 1994 [24] in which potential dam sites were identified for the possible augmentation of the water resources of the Vaal System. However, development of any such scheme would be far in the future. The NWRS has reserved these dam sites for possible

development in the national interest. The potential to transfer surplus water from the Mzimvubu River to the Orange River and hence to the Fish River catchment via the Orange-Fish tunnel is currently being investigated at a reconnaissance level of detail.

Only 45% of the land, which could be cultivated, is being fully utilised in the former homeland areas despite the poverty in the region. Although there is potential for agriculture, there are problems in starting irrigation systems in the key area. Problems experienced include: poor transport infrastructure in the area making access and time to markets difficult; lack of credit as a consequence of communal tenure. There is however potential for additional afforestation in the catchment. A Strategic Environmental Assessment of this catchment to be conducted in 2004/05, will focus on developing the forestry potential of this catchment.

The Mzimvubu catchment has highly erodable soils and suffers from a serious erosion problem, partly due to overgrazing and poor land-use management.

A separate investigation has been initiated by the DWAF after meeting with the Eastern Cape Provincial Government to determine the most feasible ways of utilising the surplus water supplies in the Mzimvubu key area for local economic development and for the benefit of the local communities. The use of the water supplies must take into account the national importance of the Mzimvubu River as a potential source of augmentation of the Vaal River Supply Area.

STRATEGIC APPROACH

A strategy to utilise the surplus water to maximise the benefit to the poor and hence uplift the stagnant economy of the region needs to be developed. As a start an investigation into irrigation and afforestation potential should be initiated but other more innovative solutions may be required, such as high value crops. Any developments must be conducted within the context of the NWRS, which has reserved water for transfer to the Vaal River Supply Area sometime in the future.

A land-use management plan needs to be developed and implemented in the Mzimvubu catchment to limit erosion. This is necessary to, *inter alia,* preserve the viability of potential major dam sites on the Mzimvubu for possible supply to the Vaal System in future. Limiting the number of stock on the land is one possible option and this should be part of a comprehensive land-care management programme.

PRIORITY

Medium to High

	MANAGEMENT ACTIONS	RESPONSIBILITY
1	Notify the relevant authorities such as the CCAW that there are significant water resources available in the Mzimvubu key area, which could be used for irrigation or afforestation in support of poverty eradication projects. The potential for these activities need to be evaluated by others.	DWAF: Regional Office
2	Investigate the future sources of water supply for Kokstad including groundwater and engage with the Local Authority on the future source of supply for the town. Ensure that this is reflected in the WSDP and IDP of Sisonke District Municipality.	

3 Through co-operative governance, address the high levels of erosion in the Mzimvubu catchment by development of a land-care management programme. This management action must be driven by the provincial Department of Agriculture and the local authorities. The IDP's must identify initiatives for land-care management. 4 Align the available water as an input factor of production in order for the Provincial Growth and Development Strategy to be implemented in the Mzimvubu key area as part of rural enterprise development. 5 The water allocation strategy for this catchment is as follows: *Water for poverty eradication/rural supply* Surplus water in these catchments should in the first instance be used for poverty eradication. While in theory there is ample run-of-river water available, the location and magnitude of these surpluses need to be verified before embarking on projects that have large water requirements. *Urban* Urban demands are limited and can be supplied from run-of-river in most cases. Where the assurance of supply is too low, storage can be developed or use made of the ample groundwater in the catchment. *Irrigation* Water for large-scale irrigation use could be made available through the provision of storage. The resource immediately available from run-of-river should be reserved for poverty eradication projects. *Forestry* From a water resource point of view, there is potential for additional forestry in this catchment.	

Strategy No 1.2

WATER RESOURCE AVAILABILITY, USE AND RECONCILIATION FOR THE PONDOLAND KEY AREA (T60)

MANAGEMENT OBJECTIVE

To ensure that the water resources of the Pondoland key area, which has very limited storage, are utilised optimally whilst ensuring that the ecological Reserve requirements are met.

SITUATION ASSESSMENT

A water balance for this key area catchments and a tabulation of use by the different sectors is provided in Chapter 6. The water resources of the Pondoland key area are limited to run-of-river flows which, after allowing for the ecological Reserve, are only just sufficient to meet the small water requirements of the key area. The Pondoland key area is approximately in balance.

The water requirements of the Pondoland catchment are very small and consist mostly of rural requirements, with small urban requirements associated with the coastal resorts. Although there is some 1 000 ha under afforestation in this key area, the area is not large enough to have a significant impact on the water resource.

Lusikisiki and surrounding villages have been experiencing water shortages. The Eastern Pondoland Basin Study identified that there is potential for both surface water and groundwater development to meet the existing and future water requirements of the key area. Further studies are being undertaken by DWAF to verify the most effective source.

There is potential for development of dryland agriculture and forestry in the Pondoland key area. The recently commissioned Forestry SEA will provide a more detailed assessment of where forestry development can take place and what mitigation measures will be required to ensure environmental protection given the high ecological importance and sensitivity of the key area.

The Pondoland key area has been identified for mining of heavy minerals. Although DWAF has not been approached with an application to allocate water for this potential development, the mines should be encouraged to approach DWAF long before water is required. This should be part of the mines' business plans.

There is significant potential for dryland agriculture including dryland sugar along the coast where rainfall is high.

STRATEGIC APPROACH

The strategy is to encourage conunjuctive use of the available groundwater sources to supply the rural requirements, for which there are sufficient resources. The DWAF and OR Tambo DM are currently investigating the groundwater potential to supply Lusikisiki and surrounding communities. DWAF has already investigated the surface water options

and is extending its study to look at groundwater after which recommendations will be made.

Dryland sugarcane might present opportunities in the key area but would require further investigation. The water allocation strategy for this catchment is as follows:

Urban

The urban demands can be supplied from groundwater. Alternatively there are opportunities to provide storage to increase the assurance of supply.

Irrigation

There is no water available for large-scale irrigation use given the high ecological status of the key area although opportunities exist for poverty eradication and small-scale commercial use.

Forestry

There is potential for additional forestry in this catchment but this would need to be carefully evaluated to understand the impact on the ecological Reserve, particularly for the estuaries.

PRIORITY

High to medium

MANAGEMENT ACTIONS		RESPONSIBILITY
1.	Investigate the potential for additional forestry in this key area giving special attention to its impact on the ecological Reserve.	DWAF: Regional Office
2.	Assist OR Tambo DM with the groundwater investigation to augment water supplies to Lusikisiki and the surrounding villages.	DWAF: Regional Office D: Options Analysis

Strategy No 1.3

WATER RESOURCE AVAILABILITY, USE AND RECONCILIATION FOR THE MTATA KEY AREA (T20, T70 & T80)

MANAGEMENT OBJECTIVE

To ensure that the water resources of the Mtata key area are utilised to develop the economy in a sustainable manner for the benefit of communities whilst ensuring that the risk of damaging the resource base is minimised by giving effect to the preliminary ecological Reserve to ensure that ecosystem health is maintained.

SITUATION ASSESSMENT

A water balance for these catchments and a tabulation of use by the different sectors is provided in Chapter 7. The water resources of the Mtata key area are dominated by the Mtata Dam which was constructed primarily for hydro-power generation. After allowing for the ecological Reserve, together with return flows and groundwater the water resources of the Mtata key area are estimated at 146 million m^3/a. This is far in excess of the water requirements, with the result that there is a large surplus in the Mtata catchment.

The water requirements of the Mtata key area, while still small in relation to the available water resource, is greater than the other three key areas put together. The largest water requirement is that of the forestry sector. There is an estimated 290 km^2 of forestry in the Mtata key area which reduces the runoff by an estimated 37 million m^3/annum. All of this forestry is upstream of the Mtata Dam which has a large impact on the yield of this dam, reducing the yield by an estimated 29 million m^3/annum. Urban requirements are also significant, estimated at 15 million m^3/a, mostly required by the town of Mtata. As with the other three key areas, irrigation is very limited in the Mtata catchment, estimated at 293 ha, despite the abundance of water, and it is estimated to use only 2 million m^3/a. Based on the current (year 2000) level of development the Mtata key area has a surplus estimated at 89 million m^3/annum.

The Mtata River Basin Study (DWAF, 2001) [17] estimated that there is potential for an additional 1 200 ha of irrigable land available in the Mngazi and Mtata catchments (downstream of the Mtata Dam) catchments of this key area. The presence of the significant urban population of the Mtata key area creates opportunity for cash crops elsewhere in the ISP area. The potential for high-value crops such as flowers which could be flown out from Mtata is also greater than elsewhere. The potential for additional afforestation in the Mtata key area is limited due to the lack of additional suitable land with sufficient rainfall.

The Mtata Dam supplies water for power generation on the First and Second Falls power stations. Since power production is not a consumptive use of water, it is therefore compatible with use in irrigation, which is required during the winter periods when there is more flow downstream of the dam. The development of irrigation downstream of the Mtata Dam will assist with reducing the winter flows produced by the power stations, which are problematic for the the

ecology of the estuaries.

As with the Mzimvubu key area, the Mtata key area suffers from a serious erosion problem, partly due to overgrazing and poor land-use management. The natural dispersivity of the soil is also a factor. This has a significant impact on the water quality of the Mtata Dam. The Mtata Dam is not silting because the soils remain in suspension.

STRATEGIC APPROACH

The strategy for DWAF is to provide support to the Provincial Growth and Development Strategy to realise its main goal of promoting rural enterprises based on sustainable utilisation of the natural resources and to develop the economy of the ISP area by developing small-scale irrigation projects. The water allocation strategy for this catchment is as follows:

Water for poverty eradication/rural supply

Surplus water in these catchments should in the first instance be used for poverty eradication. While in theory there is ample run-of-river water available, the location and magnitude of these surpluses need to be verified before embarking on projects that have large water requirements.

Urban

Increases in urban demands are expected to be limited but can be supplied from the Mtata Dam. In other smaller urban centres storage can be created or use made of the ample groundwater in the catchment to increase the assurance of supply.

Irrigation

Water for large-scale irrigation use is available through the secondary use of water supplied from the Mtata Dam for power generation. However, the availability of arable land is a serious limitation. The focus should rather be on dispersed small-scale irrigation schemes.

Forestry

From a water resource point of view, there is potential for additional forestry in this catchment, but not upstream of the Mtata Dam.

PRIORITY

High to Medium

	MANAGEMENT ACTIONS	RESPONSIBILITY
1	Notify the relevant authorities that there are significant water resources available in the Mtata key area downstream of the Mtata Dam below the hydropower stations which could be used for irrigation in support of poverty eradication projects. The potential for these activities need to be evaluated by others.	Responsibility: DWAF: Regional Office
2	Inform the authorities of the potential for irrigated agriculture in the Mngazi and Mtata catchments where 1 200 ha was identified during the Mtata River Basin Study with 507 ha available in the Mngazi catchment.	

3	Develop an operating rule for the Mtata Dam that allows for multiple use of the water released for Eskom power generation. As a start an investigation into irrigation potential downstream of the Mtata Dam should be initiated but other more innovative solutions may be required.	

Strategy No 1.4

WATER RESOURCE AVAILABILTY, USE AND RECONCILIATION FOR THE MBASHE KEY AREA (T10 & T90)

MANAGEMENT OBJECTIVE

To ensure that the water resources of the Mbashe key area, which is not highly regulated, are utilised optimally whilst ensuring that the ecological Reserve requirements are met.

SITUATION ASSESSMENT

A water balance for the Mbashe key area and a tabulation of use by the different sectors is provided in Chapter 8. The water requirements are found to be considerably less than the available resource, indicating that there is a large surplus in this catchment. The main reason for this is the large transfer from Ncora Dam on the Tsomo River in the Kei catchment to the Mbashe catchment to generate hydropower. After generating power, this water becomes available for consumptive use.

Consumptive water use in the Mbashe key area is small. The largest consumptive user is the irrigation sector, which has an allocation of 20 million m^3/a, 17 million m^3/a of which is an allocation from the Ncora Dam situated in the neighbouring Kei River catchment. Rural water requirements, which include stock watering, are estimated to be 6 million m^3/a while urban water use is 2 million m^3/a. There is a significant amount of forestry in the upper catchments of the Mbashe key area, estimated at 246 km^2 which reduces runoff by an estimated 19 million m^3/annum. The impact of this on the available yield is limited to only 3 million m^3/a.

There is a large non-consumptive use by Eskom for generating hydro-power. Water is transferred into the Mbashe catchment from the Ncora Dam in the Kei River catchment for this purpose. The NWRS quotes a transfer of 85 million m^3/a but there is some uncertainty as how much is actually allocated to Eskom or what agreements they have with DWAF on the control of this use. Although this water use is non-consumptive, the monthly distribution of this use needs to be understood better in order to ascertain how much of this can be used by other sectors situated downstream of the hydro-power stations. The impact of this large transfer on the riverine ecology is also an issue that needs to be addressed. This is discussed in Strategy 2.1.

The local water resources of the Mbashe key area have never been analysed in detail. The resource was assessed as part of this ISP and estimated at 47 million m^3/a at a 98% level of assurance. There are no significant dams in the Mbashe key area and the yield available is all from run-of-river flow. In addition to this, the water transferred from the Ncora Dam for hydropower generation becomes available for secondary use after its primary use for power generation.

The potential for additional irrigation appears to be limited due to the poor soils and the steep terrain, but this needs a more thorough assessment in the light of the availability of water. There is however also potential for additional

afforestation in the catchment.

STRATEGIC APPROACH

There is clearly a lot of surplus water available in the Mbashe catchment from the non-consumptive water downstream of Collywobbles hydropower scheme. A strategy to utilise this water to maximise the benefit of the local populace and hence uplift the stagnant economy of the region needs to be developed. As a start an investigation into more innovative irrigation methods and afforestation potential should be conducted.

The availability of water, through the secondary use of the water used by Eskom to generate hydro-power, needs to be better understood and more accurately quantified. Alternative options for the use of this water also need to be investigated. It needs to be ascertained whether the transfer from the Ncora Dam could not perhaps be better utilised in the Kei River catchment (for poverty eradication) than for power generation and subsequent irrigation in the Mbashe catchments. This will mean reallocation of water. Eskom will need to be consulted in this regard and their strategy regarding the hydro-power generating potential in the Mbashe River understood and taken into consideration.

The allocation of the surplus water can be done for the following uses in this catchment:

Water for poverty eradication/rural supply:

Surplus water in these catchments should in the first instance be used for poverty eradication. This is readily available in large quantities downstream of Eskom's hydro-power plant. The availability of water upstream of these facilites would require more detailed analysis.

Urban:

Urban demands are limited and can be supplied from run-of-river in most cases. Where the assurance of supply is too low, storage can be developed or used conjunctively with groundwater in the Key area.

Irrigation:

Water for large-scale commercial irrigation is certainly available in the Mbashe catchment and this in itself could be a viable poverty eradication strategy through job creation. The availability of suitable arable land and access to markets is however a serious limitation. High-value crops such as flowers are an option but this would require large capital investments.

Forestry:

From a water resource point of view, there is potential for additional forestry in this catchment.

Mining:

Potential for mining of the dunes is also believed to exist in this key area. Recent investigations by TICOR assumed that water for this would be sourced from the Kei River by building off-channel storage.

PRIORITY

Medium to High

MANAGEMENT ACTIONS		RESPONSIBILITY
DWAF needs to undertake the following management actions:		Responsibility:
1.	Confirm the allocation to Eskom for the transfer from the Ncora Dam. This is crucial in order to confirm how much is available for secondary use after the power generation. DWAF has installed a gauging weir to facilitate measurement of the transfers.	D: NWRP
2.	Investigate the availability of the water resources downstream of the Eskom power generation plants in close co-operation with Eskom.	DWAF Regional office
3.	The revitalisation of the Ncora Irrigation Scheme is receiving attention but will require ongoing attention, particularly the institutional, land tenure, and extension services.	DWAF Regional Office
4.	Notify the relevant authorities that there are large water resources available in the Mbashe key area which could be used for irrigation or afforestation in support of poverty eradication projects. The potential for these activities need to be evaluated by others.	D: NWRP
5.	Investigate the ecological impacts of the increased river flows associated with Eskom's hydro power generation in the Mbashe River and develop operating rules to mitigate these impacts, especially on the estuary.	D: RDM

Strategy No 1.5

GROUNDWATER RESOURCES AVAILABILITY AND USE IN THE MZIMVUBU TO MBASHE ISP AREA

MANAGEMENT OBJECTIVE

The purpose of this management strategy is to ensure the conjunctive use of surface water and groundwater, in order to optimise resource use in a sustainable manner within the ability of communities to pay for services received. The purpose is also to ensure that the different aquifers/wellfields/boreholes have appropriate operating rules and management plans that are reviewed and revised on the basis of the monitoring information. Operating rules must fulfil the legal requirements and be based on a reliable and quantitative understanding of the aquifer(s) and surface-groundwater interactions.

SITUATION ASSESSMENT

As indicated in Table 3.1 in Chapter 3, there are a number of the towns and villages whose sources of water supply are mainly from either groundwater or springs. The bulk of the current groundwater usage is from the primary aquifer in the Cedarville (T31F) area of the Mzimvubu key area. No aquifer specific numbers are available at present. There is limited use from coastal aquifers in the Mbashe key area (T90) but no usage figures are available. There is limited abstraction from the Karoo aquifers (Katberg Dolerite and regolith).

Regionally there are four key aquifer systems in this WMA. These are:

(1) large-scale alluvial aquifers underlying the flood plains below the headwaters of the Mzimvubu River extending to the Towns of Cedarville and Matatiele (T31 and T33, Mzimvubu key area);

(2) Msikaba fractured rock aquifer between Port Edward and Lusikisiki (SE Pondoland key area);

(3) Dolerite dykes and sills throughout the ISP area; and

(4) Katberg fractured rock aquifer in the western sector of the Mbashe key area (limited recharge area, within a rain shadow and storage limited as strata thin towards the east, water quality considerations).

The Mtata DWAF office is largely responsible for the monitoring and regulation of groundwater usage in this ISP area. There is dwindling supervision capacity and function in District Municipalities. The problem is two fold: lack of capacity within DWAF and the local authorities.

There is a lack of groundwater database management because of capacity constraints within the DWAF RO.

Lack of capacity to run urbanized centres and manage change from rural settlement to small towns present a major pollution and supply threat to groundwater and surface water.

STRATEGIC APPROACH

The following strategic approach is envisaged:

- ❑ To highlight the major benefits of groundwater use in terms of rural well-being and income and to raise awareness of the ivarious important linkages between groundwater and rural development. This strategy identifies appropriate technical and institutional approaches to improve the operational reliability of boreholes and the resource sustainability of aquifers in the context of rural development.
- ❑ To build the knowledge and understanding of groundwater and human resource capacity within DWAF to manage groundwater in this ISP area.

PRIORITY

High to medium

MANAGEMENT ACTIONS		RESPONSIBILITY
1.	Develop a database, information and guidelines for management and protection of different aquifers and as input to activities of other directorates and District and Local Municipalities.	Responsibility: DWAF: Regional Office
2.	Develop a springs protection programme for the ISP area in order to manage and protect the available resource.	
3.	Determine how much groundwater is available and where.	
4.	A better action would be to undertake an assessment study to determine the *status quo* of the locations, conditions and yields of selective boreholes which are able to give insights into aquifer behaviour.The outcome of the study would be the “Design and implementation of an integrated groundwater development plan”.	

Strategy No 1.6

WATER SUPPLY TO LOCAL AUTHORITIES

MANAGEMENT OBJECTIVE

The objective of this management strategy is to ensure that water services authorities are aware of their sources of water supply in their areas in order to optimise the development and use of these resources. Where surface water is difficult to access and in short supply the use of groundwater is encouraged, often conjunctively with existing surface water supplies.

SITUATION ASSESSMENT

The water supply situation in most of the towns in the ISP area is currently adequate with exceptions described under each key area below (also refer to the Table 3.1 in Chapter 3 of Part 1).

Studies such as the Mtata River Basin Study and the East Pondoland Basin Study investigated water supplies to local authorities in the Mzimvubu to Mbashe ISP area. These studies included identification of future sources of water supply to the coastal towns in order to ensure that tourism development in areas like the Pondoland would not be restricted. Studies have also been undertaken by DWAF under the Build operate train and transfer (BoTT) programme to implement water supplies to many rural villages and towns in the ISP area.

Since the establishment of District Municipalities (DMs) as Water Service Authorities (WSAs), investigations for additional or new water supplies to local authorities have been undertaken by the District and Local Municipalities (LAs) using technical advisors (consulting engineers). In most cases the capacity and water management expertise in the DM's and LM's is insufficient. When requested, DWAF regional office staff has assisted municipal officials in compiling acceptable programmes and plans. DWAF has even seconded its own staff to the local authorities. The technical manager for OR Tambo Municipality was employed by the DWAF Regional Office and then seconded to the District Municipality.

In many cases unacceptable proposals for water supply options are often recommended for implementation by municipal officials i.e. there is often insufficient raw water resources available or there are competing interests requiring water from the same source. This only becomes known when applications are made to DWAF for water licences. This gives the appearance that DWAF are delaying what are often seen as urgent and necessary water supply schemes and leads to misunderstanding and a breakdown in co-operative governance.

The IDPs and WSDPs in most local municipalities have not been completed. Until these documents are completed to an acceptable level of accuracy and detail, the information regarding the anticipated future water requirements and sources of supply for local authorities remains uncertain. Support requested and given by DWAF at the initial stages of compiling the WSDP's would overcome many of the problems encountered with the WSDP's to date. Often the fault lies with inexperienced consultants appointed by the LA's.

Many LA's obtain all or a portion of their water requirements from schemes which they now own and operate. Appendix A provides the existing water supply schemes in the ISP area. The LA's are often unaware that they must

WATER SUPPLY TO LOCAL AUTHORITIES

consult with DWAF, as the government department responsible for the management of the water resources, before making or approving recommendations regarding changes to increases in water supplies. In addition, there is often a general lack of capacity within many LA's to participate and to take responsibility for their mandate. The following water supply problems have been identified:

Mzimvubu key area

Kokstad – Water shortages experienced in the town of Kokstad were addressed by the constructon of an augmentation scheme from the Crystal Springs Dam (Ninham Shand, 2004) [27]. The town's current source of supply is from springs and the Crystal Springs Dam situated in the Mzintlava River. As discussed in the groundwater strategy (Strategy 1.5), large-scale alluvial aquifers underly the flood plains below the headwaters of the Mzimvubu River in the Cedarville and Matatiele area and can augment future water supplies to Kokstad if it is determined to be technically feasible and economically viable.

Port St Johns – The town of Port St Johns is very important from a tourism perspective. It is situated in the heart of Pondoland where there are express aims to develop the tourism potential of the area. There were increasing water shortages in the town because of the growth in tourism that is taking place. A new off-channel storage scheme in the Mtata key area is currently under construction to augment water supplies of the town and the surrounding communities.

Maclear – The source of water supply for the town is the Maclear Dam. The yield of the dam is small and cannot meet future water requirements of the town. However from the overview there seems to be potential for groundwater development to supplement the current source of water supply to Maclear.

Mtata key area

Mhlanga – The source of water supply for the Mhlanga Water Treatment Works is the Mhlanga Dam. The dam has a small yield with a storage capacity of 0.78 million m^3/a. The regional water supply scheme supplying the rural villages upstream of the Mtata Dam has been expanded and additional sources of supply are required. There are plans to utilise the existing Nqadu Dam which is currently not being utilised to supplement the water supplies of the Mhlanga Water Treatment Works.

Mhlahlane Water Supply Scheme – The Mhlahlane Water Supply Scheme is currently reliant on run-of-river as the source of supply for the treatment works. There is however a registered but unused water allocation for the scheme from the Mabeleni Dam which is not being utilised. Future augmentation of the water treatment works can therefore come from the Mabeleni Dam. The dam has a yield of 1.73 million m^3/a at 1:50 years assurance of supply.

WATER SUPPLY TO LOCAL AUTHORITIES

Mbashe key area

Engcobo – The town of Engcobo relies for its water on two streams with a combined 1:50 year yield of 0.21 million m^3/a. The water treatment works has a capacity of 0.95 Ml/d or 0.29 million m^3/a. The town has a population of 11 000. The available resource is inadequate for the requirements of the town which is a busy regional centre. This is mainly due to the commercial sector and industries in the town. The following issues and concerns have been identified:

- There is continued urbanisation in this ISP area particularly migration of the rural population in search of employment opportunities in such towns as Mtata. Water requirements are growing in most towns, even though overall populations are not increasing or are even declining in the rural areas. Services have been upgraded in most small towns under the CMIP programme which has now been replaced by the Municipal Infrastructure Grant (MIG) programme.
- DWAF and the recently appointed District and Local Municipalities are still developing relationships and hence do not yet have information sharing and co-operative governance structures in place.

STRATEGIC APPROACH

The approach will be:

- ❑ To work with and inform LA's, of where their future sources of water supplies will be.
- ❑ To promote up-front liaison and agreement between DWAF and LA's regarding proposed developments as mentioned in the WSDP's.
- ❑ To promote awareness within LA's of the need to involve DWAF in their plans and to consult DWAF before making recommendations. The WSDP's should be informed by the NWRS, ISP and Catchment Management Plans. WSDP's should highlight water conservation and demand management measures proposed by the LA's in addition to current sources of supply and future anticipated sources of supply. Future planning should consider applicable social, environmental and economic impacts and costs.

The RO will identify outstanding WSDP's and ensure that they are submitted timeously. The RO must review IDP's, WSDP's and Water Sector Plans and provide feedback to the relevant LA's to ensure that proposals conform to DWAF requirements. IDP's and WSDP's must become the documents that reflect the total municipal water strategies.

LA's should be encouraged at every available forum, committee or other venues jointly attended by DWAF and LA's to first pursue alternative augmentations options, such as water demand management, effluent reuse, water trading or eradication of invasive alien plants in water stressed areas before applying for additional surface or groundwater use. Where future water supplies have not been identified in the WSDP's, further feasibility studies must be undertaken by the LA's. An approach and strategy for water supply must be developed for each town.

DWAF is committed to assist with building capacity at District and Local Municipality level although this is constrained by the limitations of its own capacity.

WATER SUPPLY TO LOCAL AUTHORITIES	
PRIORITY: Priority 1 – Very high.	
MANAGEMENT ACTIONS	RESPONSIBILITY
1. The RO must review the WSDP's and follow up with LA's in cases where submissions are incomplete or have not been submitted. The RO must pro-actively assist the LA's with regard to development of water supply schemes and water demand management investigations and implementation programmes.	All Directorates in DWAF Regional Office
2. The RO must review the yield of the dams supplying the towns of Kokstad and Maclear, to determine how much additional water is required taking into account implementation of Water Conservation and Demand Management measures in these towns.	
3. Request the Directorate: Water Use Efficiency at DWAF Head Office and the regional water conservation and water demand management division to assist LA's with the capacity to develop business plans required for the implementation of WC/DM strategies.	
4. Establishment of a spring inventory and management of the springs is essential for the towns and villages dependent on spring supplies to avoid contamination.	
5. Aim to improve borehole monitoring.The Directorate: Information Programmes and the RO Hydrological Information Sub-Directorate must investigate this and compile a strategy to deal with the situation.	
6. Co-ordinate with the OR Tambo, Ukhahlamba, Alfred Nzo and Sisonke District Municipalities regarding further studies into future water supply options for the ISP area.	

STRATEGY NO 2: WATER RESOURCE PROTECTION STRATEGIES

THE NEED FOR WATER RESOURCE PROTECTION STRATEGIES

The Water Resources Protection Strategy addresses the need for the protection of water resources to ensure their continuing availability for human use by leaving enough water of appropriate quality in rivers and streams to maintain their ecological functioning. This will be achieved by:

- Classification of the water resource systems and determination of their human and environmental Reserves.
- Setting the Reserve and the Resource Quality Objectives of these water resource systems.
- Addressing water quality management, pollution control and sanitation.
- Addressing pollution sources.

Water required for socio-economic growth must be balanced with the availability of water that is fit for use by all users, including the protection of the aquatic ecosystem. The NWRS defines two complementary approaches for the protection of water resources. Resource Directed Measures focus on the character and condition of the in-stream and riparian habitat, whilst Source Directed Controls focus on the control of water use at the point of potential impact, through conditions attached to water use authorisations.

These strategies aim to achieve adequate protection for surface and groundwater resources in order to reach a balance between protection and sustainable use.

Relevant Identified Strategies

The Classification System is still being developed. Therefore the class of the water resource systems for the Mzimvubu to Mbashe ISP area cannot yet be determined as required by the Act. The following specific strategies are developed further:

2.1 Reserve and Resource Quality Objectives

2.2 Water Quality Management and Pollution Control

Strategy No 2.1

WATER RESOURCES PROTECTION STRATEGIES

RESERVE AND RESOURCE QUALITY OBJECTIVES

MANAGEMENT OBJECTIVE

The objective of this management strategy is to ensure that the resource base is not allowed to deteriorate to a level from which it cannot recover in order to maintain the ecosystem health and function of the resource for sustainable provision of goods and services.

SITUATION ASSESSMENT

A number of desktop Reserve studies have been conducted for this ISP area. These determinations were triggered by the many licence applications received by the Regional Office for Streamflow Reduction Activities. These determinations are provided in Appendix A14.

Mzimvubu key area

In the upper catchments of the Mzimvubu River there are a number of significant wetland areas. These wetlands have been damaged by construction of roads and agricultural practices in the area. An inventory of the wetlands in the Eastern Cape is being developed. The Working for Wetlands programme needs to ensure that the significant wetlands in the ISP area are protected from the developments and agricultural activities by determining the water requirements and the Resource Quality Objectives (RQOs).

Pondoland key area

The coastline of the Mzimvubu to Mbashe ISP area is renowned for its beauty and the potential for ecotourism development, particular along the Pondoland coast. According to the desktop Reserves this area is of high ecological importance and the Present Ecological State (PESC) has been categorised as shown in Annexure A14. Pondoland development initiatives have been investigating anchor projects to open the coastline for tourism development. The proposed N2 toll road is one such anchor project.

In order to ensure the area is preserved, the ecosystem structure and function of the rivers passing through the Mzimvubu to Mbashe ISP area (particularly the key areas of Mzimvubu and Pondoland) must be maintained. The estuaries in this ISP area are considered pristine and their maintenance requires a balance between the freshwater and seawater for the biota and habitat to be maintained.

Mtata key area

During the Mtata River Basin Study (DWAF 2001), the preliminary Reserve of the Mtata River as well as the

RESERVE AND RESOURCE QUALITY OBJECTIVES

estuarine water requirements were determined. Although the PES for the upper Mtata River was found to be in a D category, the estuaries were driving the high environmental water requirements of this key area. The PES of most of the estuaries in this key area is in a C state, requiring more freshwater to be available from the river at the appropriate time and in the right pattern. It was identified that the operation of the hydropower scheme on the First and Second Falls dams was affecting the ecosystem function of the Mtata River. This is due to the time distribution of the water, which is now available in winter, and there is less water available in summer. The Resource Quality Objectives of the rivers particularly the Mtata and Mbashe rivers, need to be developed in order to manage source directed control measures.

Mbashe key area

The present ecological state of the Mbashe river in the upper catchments was determined as a D category. This is due to non-flow related aspects such as land use and overgrazing. The forestry in the upper catchments (T11) also has had a significant impact on the low flows and therefore the ecological functioning of the upper Mbashe river system. The matter is further affected by communities dependent on run-of-river yield. The recommendations from the desktop Reserve study are to maintain the D category which represents the level of protection beyond which the reliance of the resource base will be exceeded.

The operation of the Collywobbles hydro-electric power station is affecting the flow regime and the ecological functioning of the biota in the Mbashe River. Expansion of afforestation will result in a reduction in runoff and the impacts thereof on the ecological component of the Reserve, particularly in the estuary that is considered pristine has to be taken into consideration in balancing development with resource protection. Afforestation development will also impact on run-of-river users such as the town of Engcobo.

General environmental issues

During the summer period, there are enough grazing areas for the stock. During winter farmers do not sell their stock and the carrying capacity of the land is limited. This will result in overgrazing, erosion and a further loss of the carrying capacity. The above non-flow related activities have an impact on the quality of the resource. The RQOs of all the rivers in the Mzimvubu to Mbashe ISP area have not been set because of the absence of the class of the resource. Only ecological specifications (commonly known as ecospecs) were set for the Mtata key area. These need to be monitored in order to ensure that the Threshold of Probable Concern (TPC) is not exceeded.

In the absence of a classification system, the class of the water resources of the Mzimvubu to Mbashe ISP area have not been determined to balance the objectives of ecological (resource protection), social (equity) and economic sustainability. However, the preliminary determinations of the ecological component of the Reserve have been done for the various *ad hoc* licence applications, particularly for streamflow reduction activities in the ISP area.

Although the preliminary Reserves have been determined in a number of the catchments, a concern is that these preliminary Reserves are not being implemented. This is effectively defeating the objective of protection of the resource base for sustainable ecosystem function. Section 13 of the Act requires that the Reserve be given effect to once it has been determined or an implementation strategy for the Reserve is in place.

RESERVE AND RESOURCE QUALITY OBJECTIVES	
Implementation of the Reserves can be done if the yield impact of these Reserves have been determined and the users in the catchment are informed as to how much water (either as flow or as depth) should be left in the river at the different abstraction points. There is a need to set licence conditions in order to ensure that resource protection can be done. The tools and processes for implementing the ecological Reserve have not been well developed.	
STRATEGIC APPROACH The strategic approach for resource protection of the Mzimvubu to Mbashe ISP area is to consider all aspects of the river and drainage system in their context. This means looking at the ISP area from its headwaters to the estuarine and coastal environments including wetlands and associated groundwater systems. Given that the area has high levels of poverty, this means considering environmental, economic, social and cultural values in relation to the entire Mzimvubu to Mbashe ISP area. A wide range of outcomes, from resource protection to serving the socio-economic development needs of communities are to be considered in setting the Reserve and the Resource Quality Objectives.	
PRIORITY Low to Medium	
MANAGEMENT ACTIONS	RESPONSIBILITY
1. Identify clear objectives for setting the environmental flows as well as water abstraction and use in order to balace resource protection and sustainable utilisation.	D: RDM
2. Identify rivers and estuaries of high ecological importance and sensitivity and develop the Resource Quality Objectives for the entire Mzimvubu to Mbashe ISP area with particular attention to the receiving quality objectives of the Mtata River.	D: RDM
3. Identify the tools and develop the processes and mechanisms for implementation of the preliminary Reserve. The current assurance rules tables should be simplified to allow the personnel in the RO to be able to use the results not only for considering licences but also to set the licence conditions, thereby giving effect to the Reserve.	D:RDM
4. Develop a manual for implementation of the preliminary Reserves and build capacity within the RO.	D:RDM
5. DWAF must set a monitoring programme to determine whether the threshold of probable concerns (TPCs) set to achieve the RQOs are not being exceeded.	D:RDM
6. DWAF must prioritise the estuaries in terms of the ecological importance. The high priority estuaries must be protected and monitored.	D:RDM

RESERVE AND RESOURCE QUALITY OBJECTIVES		
7.	Undertake comprehensive Reserves for the rivers and estuaries as determined by the national priorities.	D:RDM

Strategy No 2.2

WATER RESOURCES PROTECTION STRATEGIES

WATER QUALITY MANAGEMENT AND POLLUTION CONTROL

MANAGEMENT OBJECTIVE

The objective of this management strategy is to address the water quality concerns of the Mzimvubu to Mbashe ISP area through preventive actions to address point and non-point source pollution to ensure the protection of the downstream users, including the ecology.

SITUATION ASSESSMENT

The water quality of the Mzimvubu to Mbashe ISP area is naturally of good quality. However there is potential for pollution of the good water quality because of the following:

- Agriculture: Overgrazing in the ISP area is causing large silt loads. There is limited irrigation in the area and therefore there is no serious problems for now.
- Rural Population: The majority of the population in the Mzimvubu to Mbashe ISP area are located in the rural areas. There are no proper sanitation infrastructure in most of the rural villages which leads to pollution of the sources of supply and a high risk of waterborne diseases. The situation will improve once the huge backlog on the sanitation infrastructure and proper water supply schemes have been dealt with. Where the source of supply is groundwater, there is a need to ensure that the recharge capture areas are adequately protected.
- Urban areas: The biggest problem in the urban areas is that the sanitation systems do not cope with the densely populated areas. This results in untreated sewage ending up in streams on which downstream communities are dependent for their source of supply.

The following are typical water quality problems found in the Mzimvubu to Mbashe ISP area. The investigations of the Mtata River Basin Study (DWAF, 2001) identified that the water quality immediately downstream of the Mtata Dam and below the town of Mtata was poor and deteriorating (see Appendix A5). The situation is not only prevalent in the Mtata River. Water quality problems have also been identified in other areas such as Mngazi, Lusikisiki and Port St Johns. There are three main reasons for the deteriorating water quality situation. These are:

(i) Overflow of untreated sewage into the Mtata River. There are capacity problems with the existing sewage pump stations to handle the additional amount of sewage generated since the construction of the Nelson Mandela Hospital in Mtata.

WATER QUALITY MANAGEMENT AND POLLUTION CONTROL

(ii) Lack of sanitation infrastructure in rural and informal settlements in the catchments. This situation is very serious in the informal settlements around Mtata. Some of these informal settlements are situated within the flood line of the Mtata River, increasing further risk of human loss in times of floods.

(iii) Soil erosion is a major problem in the whole ISP area.

The impacts of these factors are discussed below.

- Discharge of untreated sewage and storm-water runoff into rivers: The discharge of untreated or inadequately treated sewage from the Mtata Prison and the town of Mtata into the river because of the inadequate capacity of sewage treatment works and sewage pump stations has significantly contributed to the deteriorating water quality problems in the rivers. Untreated effluent is discharged into the Mtata River, causing a health risk to downstream communities who use the water. It also settles into the First Falls and Second Falls dams, enhancing eutrophication with resulting undesirable algae growth.

  In addition to the untreated sewage runoff, stormwater runoff from Mtata has been found to cause pollution problems in the Mtata River as a result of the following processes:

  - Growth of the towns – Mtata, and to a lesser extent the other towns, have been growing rapidly because of the urban-pull effect of the rural population seeking employment. As the towns have grown the new areas and the peri-urban areas have either been connected to old sewer systems or not connected to any sewer system at all. The old sewer systems have inadequate capacity and may overflow during heavy rainfall as a result of stormwater infiltration, resulting in polluted stormwater flowing into the rivers. Where residential areas are not connected to sewer systems and effective alternative sanitation systems are not provided, human waste collects on the ground and pollutes the water flowing over the ground during heavy rainfalls. This has increased runoff of poor water quality into the Mtata River and other rivers in the area.

  - Wash-off from impervious areas – In the case of Mtata the impervious areas comprising streets, sidewalks and parking lots generate significant quantities of runoff when it rains. This water (particularly the first floods) runs off into the Mtata River through the stormwater drainage system. The runoff picks up oils and bacteria, which have detrimental effects on the aquatic life of the river due to their toxicity and on humans using the water for cooking, washing and drinking.

  - Dense rural and informal settlements along the banks of the Mtata River - There are a number of dense informal settlements along the banks of the Mtata River without any formal sanitation infrastructure. Because of lack of proper sanitation facilities, there are high nitrate concentration levels in the river water downstream of these settlements. A study undertaken by the University of Fort Hare for the Water Research Commission (WRC) clearly showed high counts of faecal coliforms and ammonia, which indicated the presence of pathogenic bacteria in the Mtata River. The pathogenic organism of chief importance in water-borne diseases is Salmonella typhosa, and studies have shown that there is a direct relationship between coliform

WATER QUALITY MANAGEMENT AND POLLUTION CONTROL

organisms and S. typhosa.

- Soil erosion problems - The Mtata River catchment contains areas of extensive erosion where the loss of topsoil has been caused by rain and wind erosion that has occurred because of the topography and the human settlement pattern. Most of the soils eroded end up in the rivers, increasing the turbidity of the water in the rivers. The geological formations typically give rise to dispersive soils, which remain in suspension and do not settle in dams such as the Mtata Dam.

The extent of soil erosion can be seen in the upper catchments of the ISP area because of the steep topography and high rainfall. The land use pattern as indicated in Chapter 3 is also increasing the soil erosion through overgrazing and subsistence agriculture in the highly populated upper and central areas of the catchments. Vegetation has become very sparse where there are human settlements, especially in the dry period of the year. This means there is no protection of the soil from erosion when the first rainfalls occur each year.

The land-tenure system that is prevalent in the ISP area creates problems as well, as it makes it difficult to apply grazing management systems and good farming practices.

The impact of soil erosion on the raw water quality increases investment costs and the cost of operation and maintenance of water treatment works in towns like Mtata and Mqanduli. The extent of the problem is mainly centred in the upper and central catchments of the ISP area.

There are a number of springs supplying domestic water to communities in the Mbashe key area. Most of the springs are situated in low lying areas where contamination is likely. However it is only when cholera outbreaks occur that springs are protected. A proactive spring protection programme is urgently required.

STRATEGIC APPROACH

Water quality needs to be managed with the same attention as quantity in the ISP area where in many instances the water quality issues are more urgent. Whilst there is an urgent need for monitoring, the serious water quality issues already identified must be given immediate attention.

The strategic approach that DWAF needs to take is to ensure pollution control at the source and develop source directed control measures for the ISP area. Priority should be put on the Mtata River which is being severely impacted with the potential of serious health consequences. DWAF needs to engage the local authorities and all relevant agencies responsible for water quality problems experienced in the area.

PRIORITY - Very high

MANAGEMENT ACTIONS	RESPONSIBILITY
(i) Determining the water quality objectives for rivers such as the Mtata because of the direct downstream use of the river for drinking purposes by communities living near the banks of the river.	Regional Office Water Quality Management
(ii) DWAF should improve on cooperative governance actions but where this is	

WATER QUALITY MANAGEMENT AND POLLUTION CONTROL		
	failing consider remediation and legal measures where the responsible local authority has not met the required standards for effluent discharges. Identify the constraints in the local authorities and through co-operative governance assist in capacity building of the institutions discharging waste in the ISP area to ensure proper operation and maintenance of the existing wastewater treatment plants.	DWAF: Regional Office
(iii)	Urgent development of a spring protection programme for the ISP area.	DWAF: Regional Office
(iv)	Develop and implement a strategy of education and training to protect borehole head areas from water spillage, damage by cattle drinking, etc. Position new boreholes well away from settlements, and pipe water to the settlement, where the groundwater resources are suitable to do this.	DWAF: Regional Office
(v)	DWAF must encourage regional solid waste management for the ISP area with transfer stations from other areas such as Port St Johns, etc.	Regional Office and Dir: WDD
(vi)	Motivate for the Mtata River to be a listed water resource in the General Authorisation for discharge to comply with special limit values.	DWAF: Regional Office

STRATEGY NO 3 – WATER USE MANAGEMENT STRATEGIES

THE NEED FOR WATER USE MANAGEMENT STRATEGIES

Chapter 4 of the NWA describes the provisions by which water use may be progressively adjusted to achieve the Act's principle objectives of equity of access to water, and sustainable and efficient use of water. Many of the Act's sustainability and efficiency-related measures would be applied through conditions of use imposed when authorisations to use water are granted. Formal water use authorisations will also facilitate administrative control of water use by water management institutions, and will form the basis upon which charges for water use may be made, and provide for the collection of water-related data and information.

Until compulsory licensing is introduced, the existing water use control measures need to be strategically implemented to provide a means of reducing the number of authorisations that require processing under the existing arrangement. This is done through a General Authorisation and Schedule I use. The protection of the water resource must not be compromised through the modification of existing controls.

The Water Use Management Strategy may be required to address:

- Management of Schedule 1 water use.
- Management of water use in river basins shared with other countries.
- Usage of General Authorisations to manage water use.
- Verification of existing water use and its lawfulness.
- Processing and issuing of new water-use authorisations.
- Control of invasive alien plants and weeds.

10.1 RELEVANT IDENTIFIED STRATEGIES

The following specific strategies have been developed further for this ISP area:

3.1 Schedule 1 use and General Authorisations and licences for water use

3.2. Strategy for Stream Flow Reduction Activities in the Mzimvubu to Mbashe ISP area

3.3 Water use from Ncora Dam to the Mbashe key area.

Strategy No 3.1

WATER USE MANAGEMENT STRATEGIES

SCHEDULE 1 USE AND GENERAL AUTHORISATIONS AND LICENCES FOR WATER USE

MANAGEMENT OBJECTIVE

The objective of this strategy is to ensure that the current processes and mechanisms of issuing a license are streamlined so that existing and potential users can have access to the surplus water resources of the area with minimal administrative burden.

SITUATION ASSESSMENT

General Authorisations (GAs) are a tool in the WMA aimed at reducing the pressure on the need to issue individual licenses. All water use needs to be registered and ultimately licensed – but the NWA recognized that this could place an impossible or unnecessary burden on the regulatory authorities, especially in cases where there were many applications for new uses, and little doubt as to the acceptability of the water use, and therefore the issue of the licence.

The General Authorisations is therefore aimed at allowing some category of new users to commence with that use without having to apply for a licence – provided that use is within the scope and limitations of the General Authorisation. The user must still register that use, but it is automatically legal under the GA process and does not need special approval. Typically GAs are available for the taking and storage of water up to a certain limit per user – and these GAs are declared for areas where there may be plenty of water and no question of overuse, or where storage of water may provide no foreseeable threat to the resource. GAs may also be declared to allow the discharge of waste water (again very strong conditions will apply,) and most recently a GA has been published to allow for the modification of stream banks without the specific need for a licence under certain conditions. (A strict reading of the NWA otherwise requires, for example, that every stream culvert must be individually licensed).

GAs were, until 2004, handled as a national function and determined and gazetted centrally, although local input was obviously important. This situation has now been rationalized, a recognition both of the value of the GA as a tool, but also of the importance of and revising all GAs finely, frequently and at local scale. GAs can be proclaimed for very specific needs in very specific places. GAs are now reviewed at the level of the WMA authority (currently the Region) and may be at quaternary or even finer scale and changed annually or even more frequently if required. It is, indeed, extremely important that all GAs are regularly reviewed. As soon as there is any indication that the resource needs to be brought under tighter control then the GA should either be rescinded or modified. It is up to the Region to keep track of the situation and to motivate such modifications as required.

It must be noted that a water use under a GA (provided that use is registered) carries the same authority as use

SCHEDULE 1 USE AND GENERAL AUTHORISATIONS AND LICENCES FOR WATER USE

under licence. Note that (a) the GA may be modified and this will affect new users but will not affect the rights of users who commenced that use under the GA in force at the time, and (b) any exceedance of the conditions of use under the GA will constitute illegal use.

GAs are not available for Stream Flow Reduction Activities (SFRAs). The reason for this is primarily because the control and licensing of forestry is a co-operative governance function and cannot be authorized only under the NWA. In practice the water-use aspect could be allowed for under a GA but there is little point in this given that any application must be considered and evaluated by all co-operative governance partners. The mapping of suitable areas for forestry with mapping outlining areas where water, environmental and agricultural constraints have all been suitably accounted for, is the closest that forestry has come to a GA. Such a map has been produced for communal land in southern KZN but this process has not yet been followed in the Eastern Cape.

In the Mzimvubu to Mbashe ISP area a GA allows for a person to "abstract surface water at a rate of up to 25 litres per second for:

(i) the irrigation of up to 25 ha of land, at 6000 m^3/ha/a, or
(ii) purposes other than irrigation, up to 100 m^3 on any given day; and
(iii) store up to 50 000 m^3 of water".

Despite the overall abundance of water the following areas were excluded from this GA in the Mzimvubu to Mbashe:

- T11A and T11B (Slang and Xuka river catchments)
- T20A and T20B quartenaries in the Mtata River, upstream of the Mtata Dam
- T35A,B,C,D,F and G being the catchments of the Tsitsa, Pot, Mooi, Inxu, Wildebees and Gauteng Rivers

All of these catchments were excluded from the relaxation allowed by the GA because of the high level of development, primarily commercial forest plantations, which limits the available resource in these catchments. (In other words care must be taken with regard to the issue of all further water-use licenses in these quaternary catchments).

There is a lack of access to information by the deeply rural communities of the Mzimvubu to Mbashe ISP area on the opportunities that are available to them to utilise water under the General Authorisation. In most of the small irrigation schemes visited, the farmers are not aware of their rights to water as well as subsidies available to emerging farmers under the NWA.

The revised GA provides the listed water resources where discharge of waste or water containing waste into a water resource through a pipe, canal, sewer or other conduit, in accordance with Section 21 (f) and (h), is excluded. In the Mzimvubu to Mbashe ISP area the following are listed water resources:

- Xuka River to the Elliot district boundary
- Tsitsa and Inxu rivers to their confluence
- Mvenyane and Mzimvubu rivers from sources to their confluence
- Mzintlava River to its confluence with the Mvalweni River

SCHEDULE 1 USE AND GENERAL AUTHORISATIONS AND LICENCES FOR WATER USE	
A number of issues arise from the revised GA with particular reference to resource protection as required by the Act. The GA does not distinguish between instream storage and off-channel storage as the impacts on the resource are quite different. Instream storage will have significant impact on the floods and freshets which will be required by the ecology. This has not been dealt with in the GA Notice No. 399. The GA also allows for the construction of structures across a watercourse if it does not occur within a distance of 500 m upstream and downstream of other structures. This can have a serious ecological impact as can be seen in the Komati system where several weirs have been constructed in series. This has changed the lower Komati system into a canalised system. A GA should be catchment specific in order to cater for local conditions and not be too generic.	
STRATEGIC APPROACH The majority of the communities in the Mzimvubu to Mbashe ISP area use small quantities of water which falls under either Schedule 1 or the General Authorisation. The strategic approach for DWAF is to provide information to and to create awareness among the communities on the procedures for authorising water use and the process of General Authorisation.	
PRIORITY Very high	
MANAGEMENT ACTIONS (i) DWAF must through the CCAW undertake an awareness campaign on the availability of water under General Authorisation. DWAF should undertake a public participation process to create awareness and educate communities on how they can utilise the available water resource. (ii) As part of the SEA study investigate the feasibility of quaternary-wide allocation of licences for Stream Flow Reduction Activities focused on developing community forestry.	RESPONSIBILITY DWAF Regional Office

Strategy No 3.2

WATER USE MANAGEMENT STRATEGIES

IMPLEMENTING SFRA - FORESTRY MANAGEMENT

MANAGEMENT OBJECTIVE

The objective of this strategy is to balance forestry development and management with the need for water resource protection for sustainable ecological functioning in order to achieve socio-economic objectives and eradicate poverty that are evident in the Mzimvubu to Mbashe ISP area.

SITUATION ASSESSMENT

The Eastern Cape holds 10.7% of South Africa's plantation resource, contributing:

- 4.4% of the R2.5 billion forest industry contribution to the GDP
- 1.5% of the R12.8 billion timber products contribution to the GDP

Although not contributing significantly to the GDP, the Mzimvubu to Mbashe ISP area has however been identified to have significant potential for forestry development, approximately 73 000 ha. The potential for further forestry development, namely in the key areas of the Mzimvubu to Mbashe ISP area is further supported by the significant amount of surplus water that is not currently being fully utilised. Recently DWAF's Forestry Enterprise Development Organisation (FEDO) identified priority quaternary catchments for forestry development where the determination of preliminary Reserves is required. The following estimate is made of the potential forestry development in each of the key areas of the Mzimvubu to Mbashe ISP area:

Pondoland key area: There is approximately between 15 000 to 35 000 ha of afforestable land in the whole T60 secondary catchment comprising the key area. SAPPI has identified outgrower projects. There are also a number of communal schemes identified in this key area, particularly along the coast.

Mzimvubu key area: Between 2 000 and 6 000 ha of afforestable land in T32G near Mt Ayliff and T33H and J (between Mt Frere and Flagstaff) has been identified. There is high potential for afforestation although the economies of scale limit commercial development of forestry.

Mtata key area: Approximately 2 000 to 6 000 ha of potential afforestable land was identified in this key area primarily in the vicinity of Libode, and a request for the determination of the preliminary Reserve was made to the Directorate: Resource Directed Measures.

Because the ISP area is the poorest compared to the rest of the Mzimvubu to Keiskamma WMA there is justification for developing commercial and community woodlots to contribute to economic development of the

IMPLEMENTING SFRA - FORESTRY MANAGEMENT

area and thereby contribute to poverty eradication. The area also has a population which is deeply rural and lacks access to resources.

The main constraints affecting expansion of the forestry can be summarised as follows:

The need to conduct an environmental impact assessment by the provincial DEAET in order to determine the long-term viability of forestry development. There is significant potential for the expansion of forestry in the coastal areas of the ISP area but the environmental impact of this development needs to be carefully assessed and mitigation measures identified. There is a need to ensure co-operative governance between the relevant institutions regarding environmental impact assessments and the granting of licences for SFRAs.

Water Use Licensing – for each licence application DWAF requires that a preliminary Reserve is determined before the licence can be considered. The determination of the preliminary Reserve has been largely blamed for the delay in issuing licences even for community forestry because the process takes a long time. It has been established however that the main reason for the delay in Reserve determinations is due to the lack of capacity both within the Region as well as the Directorate: RDM to conduct some of the Reserve determinations. Although the time required to conduct a Reserve determination using the Rapid method requires only 2 days, the procurement process takes two to three months to outsource the specialised services required to conduct the determination of the preliminary Reserves.

Road Infrastructure – There is a lack of sufficient road infrastructure to carry the timber to the sawmills.

Lack of access to finance and markets - There is sufficient land & water for expansion of the underdeveloped forestry sector. However there is not sufficient critical mass to create the economy of scale required to attract markets.

Land tenure - Most of the available land is tribal land. Although DWAF has no direct influence on the tenure system, the contribution of water as an input for production can be constrained by the land-tenure system that is not conducive to attracting access to finance because of lack of collateral. It is understood however that the National Department of Land Affairs and the Provincial Government are in the process of addressing the land-tenure system in order for communities to use land as collateral to have access to capital.

In order to overcome the above constraints, the Provincial Government has established the Transkei Rapid Impact Programme (TRIP) (PGDP; 2003) as a vehicle to expand forestry production by support to small-scale saw millers to improve security of supply and to upgrade technology and marketing. 50 000 hectares of individual and community woodlots are planned for development integrated with the development of a chipping mill. This initiative will require DWAF support in ensuring that the available surplus water and the administrative procedures for considering licence applications are streamlined. A process is now in place between the Provincial DEAT and DWAF to fast-track the granting of a record of decisions and the approval of licences for the investment in forestry expansion to take place.

IMPLEMENTING SFRA - FORESTRY MANAGEMENT

STRATEGIC APPROACH

Forestry is very important in this ISP area. There is significant potential for forestry development in the ISP area. Forestry will create jobs and generate wealth. It will also be able to act as a catalyst for rural development thereby reversing the migration of the rural population to urban areas in search of jobs.

Forestry and especially community forestry, appears to be one effective way of utilising surplus water in the Mzimvubu to Mbashe ISP area to good use. However development of commercial forestry plantations makes demands on the base flow and this can be in conflict with the objectives of water resource protection to sustain ecological functioning of goods and services from the rivers. There will be a need to balance resource protection with development for the benefit of communities through equitable distribution of the resource.

The Department is supporting a Strategic Environmental Assessment to confirm that allocations of water to forestry meet social, ecological and economic concerns in the short to long term.

The approach is currently based on the understanding that there is sufficient water to support very significant areas of forestry, although catchment-specific investigations (quaternary catchment scale) will always be required to ensure that the Reserve and specific needs of local communities are not unduly impacted.

Given that most land is communally held, most of this forestry (and its water allocation) will be in the hands of rural communities.

PRIORITY

Very high

MANAGEMENT ACTIONS		RESPONSIBILITY
(i)	DWAF must continue to engage with the Eastern Cape Provincial Government on the proposed developments as part of the Integrated Sustainable Rural Development nodes of OR Tambo, Chris Hani and Ukhahlamba District Municipalities and inform the province of where the surplus water is available.	Directorate: NWRP
(ii)	Assess the impact of SFRA's in the Mzimvubu to Mbashe ISP area on the base flow of the water resource systems through the SEA process that is currently being conducted. multi-objective criteria for decision making to achieve social (equity and poverty eradication), and economic development of the ISP area and resource protection through giving effect to the Reserve and setting the Resource Quality Objectives of the river systems, must be developed as part of the SEA process.	DWAF: Regional Office Forestry Management
(iii)	DWAF should communicate the findings of the SEA projects to the Province with regard to potential areas for forestry expansion where the environmental impacts will be minimised or could be mitigated.	
(iv)	Maintain the continued co-operative governance between DWAF and the	

IMPLEMENTING SFRA - FORESTRY MANAGEMENT	
DEAT to facilitate and speed up the granting of licences for SFRAs where appropriate for economic growth and employment creation.	

Strategy No 3.3

WATER USE MANAGEMENT STRATEGIES

USE OF WATER FOR POWER GENERATION IN THE MTATA AND THE MBASHE KEY AREAS

MANAGEMENT OBJECTIVE

The objective of this strategy is to assess the beneficial use of water transferred from the Ncora Dam in the Amatole Kei ISP area into the Mbashe key area to support hydropower generation and irrigated agriculture. This strategy will investigate the business case for the intra-water management area transfer compared to the utilisation of the water supply in the Upper Kei catchments (refer also to the Amatole-Kei ISP report).

SITUATION ASSESSMENT

In terms of Chapter 4 section 37 of the National Water Act (Act No 36 of 1998), the use of water by Eskom for hydropower generation alters the flow regime of a water resource and has been declared a controlled activity.

Eskom has hydro-electric power schemes that are located in the Mzimvubu to Mbashe ISP area (see Appendix A10). These are described below.

Collywobbles hydro-electric power scheme

This hydro-electric power scheme is situated in the Mbashe River. The scheme has a generating capacity of 14 MW. The scheme can be upgraded by an additional 14 MW generating capacity. The load factor for the scheme is 30%. Collywobbles requires approximately 2.96 million m^3 per GWh generating capacity.

The source of water for power generation is the Ncora Dam situated in the Upper Kei River catchment. It is estimated that approximately 85 million m^3/a is transferred from the Ncora Dam for the purposes of generating power at Collywobbles. However this figure is only an estimate and the actual volume that is transferred and the pattern of transfer is not well understood. A gauging weir has now been constructed to measure the volume that is transferred. The yield of the Ncora Dam is also not certain (refer to the Amatole-Kei ISP report). Eskom has a weir at Collywobbles which provides the head to generate the electricity. The weir is now silting up because of upstream soil erosion. The future of the scheme is therefore being affected. Discussions with different business units in Eskom have indicated that there are uncertainties about the future of the Collywobbles hydro-electric scheme.

The Collywobbles hydro-electric power scheme supplies peaking power to the Eastern Cape. Its advantage is that as a hydro-electric plant on standby it can be put into operation at short notice.

The operation of Collywobbles to meet peaking power in the region means that the water is released for power generation during winter periods. This is in direct conflict with the pattern for maintaining a sustainable

USE OF WATER FOR POWER GENERATION IN THE MTATA AND THE MBASHE KEY AREAS

ecosystem structure and function. The ecology requires water during the summer months and less water during winter months. The impact of the reversal of flows has not been quantified, not only in ecological terms, but also its influence on the tourism potential of the key area, and particularly on the estuary.

Ncora Dam is also the source of water supply for the Ncora Irrigation Scheme situated in the Mbashe Key area. The main issues and concerns with the intra-water management area transfer from the Ncora Dam to the Mbashe key area can be summarised as follows:

- The actual amount of transfer from the Ncora Dam is unknown.
- There is an increasing demand for the water from the Ncora Dam from the communities situated downstream of the dam in the Tsomo River.
- The weir at Collywobbles is silting up and affecting the generating capacity of the hydro-electric scheme. The future of the scheme is uncertain and Eskom has not clearly stated whether it will continue operating the scheme.
- The current flow pattern is causing ecological damage; the impact is not well understood. The ecological importance of the downstream reach should be compared with the value of water for power generation to ascertain the negative externality caused by the power generation and whether there is merit in continung with power generation.

Power generation from the Mtata River

Power generation at Mtata requires approximately 5.4 million m^3 per GWh. The analysis carried out during the Mtata River Basin Study indicated that the power stations can operate with an average load factor of 15% which is annually distributed to give more power during the summer months (5% load factor) and less during the winter months (5% load factor). Because of this operation, there are high flows during the winter months and low flows during summer. This situation is opposite to the natural flow conditions and has an impact on the natural functioning of the ecosystem of the Mtata River.

The benefit from hydro-electric power generation was estimated in the Mtata River Basin Study at R2.5 million/a at an average energy charge of 11 cents/kWh. The value of power generation is relatively low and it is unlikely if a better high-value user such as municipal or irrigation for high value crops could be identified.

STRATEGIC APPROACH

The strategic approach for the above issues and concerns is to unpack the opportunities and constraints of use of water in the Mbashe key area. There is a need to develop a clear strategy and agreement between DWAF and Eskom on the licence for hydropower generation at both Collywobbles and First and Second Falls.

PRIORITY

High

USE OF WATER FOR POWER GENERATION IN THE MTATA AND THE MBASHE KEY AREAS		
	MANAGEMENT ACTIONS	RESPONSIBILITY
(i)	DWAF must as a matter of urgency determine the allocation from Ncora Dam for hydropower generation at Collywobbles.	Directorate: NWRP
(ii)	DWAF must engage with Eskom on the future of the hydropower schemes in the ISP area.	D: NWRP
(iii)	Based on the future of the scheme, DWAF must review the water allocation to Eskom in terms of its high priority as a strategic user and licence conditions	Directorate: Water Use
(iv)	DWAF should determine the pricing of water for hydropower generation based on the pricing strategy.	Directorate: Water Use
(v)	An assessment of the yield of the Ncora Dam needs to be done and the increasing water use downstream of the Ncora Dam factored into the volume to be transferred.	DWAF RO with assistance from NWRP
(vi)	If Eskom wants to increase the generating capacity by 14 MW then the application for a licence should be considred only if an impact assessment of the change in flow on the ecosystem functioning and the long-term sustainability of the resource base is undertaken.	Directorate: RDM

STRATEGY NO 4 - WATER CONSERVATION AND WATER DEMAND MANAGEMENT

THE NEED FOR WATER CONSERVATION AND WATER DEMAND MANAGEMENT STRATEGIES

The options for further augmentation of water supplies by developing new physical infrastructure are becoming increasingly limited and expensive. As a result more attention is being placed on managing the demand for water, encouraging its efficient and effective use, and reducing losses in supply systems. This requires the creation of a culture of water conservation and water demand management (WC/WDM) amongst individual users and within all water management and water services institutions.

The National Water Conservation and Water Demand Management Strategy is based on the premise that many water users can maintain their quality of life and achieve the desired outcomes from their water use, whilst using less water. Furthermore significant reductions in water use can be achieved by changes in behaviour and the adoption of water-saving technologies. DWAF will continue to encourage all water users to voluntarily comply with water conservation and demand management principles and strategies.

Whilst water is relatively abundant in the Mzimvubu – Mbashe ISP area the principles and practices of WC/DM remain very important. DWAF has a clear policy that efficient use of existing water supplies must be implemented before new sources of supply are developed.

The Water Conservation and Water Demand Management Strategy is required to address the urban, agricultural and industrial sectors.

RELEVANT IDENTIFIED STRATEGIES

The following strategies form part of this overall strategy:

4.1 Managing Demand in Water Services Institutions

4.2 Managing Demand in the Irrigation Sector

Strategy No 4.1

WATER CONSERVATION AND WATER DEMAND MANAGEMENT STRATEGIES

MANAGING DEMAND IN WATER SERVICES INSTITUTIONS

MANAGEMENT OBJECTIVE

The objective of a demand-side management strategy is to make more efficient use of the existing available water resources to the domestic and industrial sectors before consideration is given to the development of expensive alternative sources of supply.

SITUATION ASSESSMENT

Significant water losses and water wastage are known to occur in Water Services Institutions of the Mzimvubu to Mbashe ISP area. The WSDPs that have been developed by the Local Authorities have not demonstrated that existing water supplies are being use efficiently and there is no scope for managing demand. The focus of most of the WSDPs in this ISP area has been on supply- side management.

The two studies commissioned in the area, namely the Mtata River Basin Study and the Eastern Pondoland Basin Study, did not investigate the water-use efficiencies and water losses in the various water-user sectors like the irrigation sector, electricity generation, etc. in order to determine whether there were issues in this regard and whether there is scope for managing demand and conserving water. Preliminary investigations indicated that there are high quantities of unaccounted for water in Mtata. This may be due to the poor state of repair of the water supply infrastructure and meter-reading errors in the town. As a result, the unit operating costs for the water supply have increased because the water losses do not generate revenue. The situation assessment study conducted by the Regional Office of DWAF for the town of Mtata identified that there are high quantities of unaccounted for water losses in the town, estimated at 51%. As a result of wastage in the town the wastewater treatment works are being overloaded because about half of the total supply into the town is not used and some of the water ends up as wastewater. This results in inefficient and inappropriate allocation of financial resources.

At a meeting of the Mtata Catchment Forum, other towns such as Nyandeni were also identified as having high quantities of unaccounted for water and high per capita consumption.

The effect of inefficiency of water use and high water losses on the water resources will be the need to augment the source earlier than would be absolutely necessary. The headroom of most of the water supply schemes in the Mzimvubu to Mbashe ISP area indicate that augmentation is required within five years because

MANAGING DEMAND IN WATER SERVICES INSTITUTIONS

the headroom will be less than 5% (the benchmark for best practices). The following schemes were identified to have headrooms of less than 5%:

- Port St Johns
- Kokstad water supply scheme
- Engcobo water supply scheme

Augmentation of water supplies will divert financial resources from other high priority activities such as economic growth that will contribute to poverty eradication. Additional water resources allocated to one sector might impact on the water resource availability to other water user sectors. The negative impact on the consumers is a potential increase in the tariffs, which will reduce the disposable income of the community. It does not therefore mean that because the water resources are available, other resources such as finance are available for supply-side management.

One of the major constraints in implementing water conservation and water demand management in the Water Services Institutions of the Mzimvubu to Mbashe ISP area is the lack of relevant skills to develop business plans for the implementation of water conservation and water demand management measures, let alone implement such measures. Institutional strengthening is critical if improved demand management is to be achieved in the municipalities.

STRATEGIC APPROACH

The strategic approach that the DWAF needs is to ensure that Local Authorities develop effective and implementable water conservation and water demand management measures in their Water Services Development Plans (WSDPs) by providing strategic support and guidelines for preparing WC/WDM business plans. These measures must reflect the business case for municipalities to implement such measures. This strategy has the benefit of increasing the local municipality's revenue (through an appropriate rising block tariff). The resource of the local authorities can be efficiently allocated for priority projects rather than augmenting wastewater treatment plants, which cannot be operated efficiently because of capacity problems.

PRIORITY:

Medium

MANAGEMENT ACTIONS	RESPONSIBILITY
1. DWAF must assist the local authorities with the development of a Regional WC/WDM strategy for the whole Mzimvubu to Mbashe ISP area catchments. DWAF must assist local authorities by undertaking situation assessments and developing a business case that shows the benefits of implementing WC/DM measures.	Regional Office and DM

MANAGING DEMAND IN WATER SERVICES INSTITUTIONS		
2.	DWAF must publicise their guidelines on the development and implementation of WC/DM for Water Services Institutions	The DM's are responsible for initiating the awareness campaign with assistance from the Directorate: Water Use Efficiency
3.	DWAF must ensure that water is distributed efficiently by encouraging the water services institutions to initiate a metering programme, by implementing a leakage control programme and pressure management where it is relevant. The LM must update the primanry component and as-built drawings.	
4.	DM must initiate an awareness campaign with institutional stakeholders to educate them on the benefits of WC/DM such as maximising the return on existing capital investment.	
5.	Provide support to water services institutions to develop and implement WC/DM measures specific to their circumstances should be given by DWAF.	
6.	DWAF must ensure that all WSDPs spell out the targets to reduce wastage and the procedures to be followed to achieve these targets.	
7.	DWAF should encourage any current initiatives in water conservation and water demand management that are taking place.	
8.	DM should encourage the local authorities to implement rising block tariffs where this is not being implemented, as an economic instrument for reducing water use to sustainable levels.	
9.	The WSAs must develop water services policies and by-laws based on the DWAF generic policies and by-laws.	

Strategy No 4.2

WATER CONSERVATION AND WATER DEMAND MANAGEMENT STRATEGIES

MANAGING DEMAND IN THE IRRIGATION SECTOR

MANAGEMENT OBJECTIVE

The objective of this strategy is to ensure that the on-field and off-field water use by the irrigation sector is being efficiently utilised for the sustainable management of the water resources.

SITUATION ASSESSMENT

The irrigation sector in the Mzimvubu to Mbashe ISP area has an allocation of approximately 40 million m^3/a, which is 31% of the total water requirements. This amount is not significant when compared with the non-consumptive use by Eskom for hydropower generation. There are significant agricultural activities and irrigation of lucerne in the Mzimvubu key area, particularly in the former RSA areas of Matatiele and Kokstad. These areas are known to be utilising high technology for irrigation, namely sprinkler irrigation systems. Although there is limited scope for implementing WC/DM measures, the farmers have not yet approached DWAF to establish a WUA. The WUA needs to develop water management plans which can be used to benchmark their current irrigation practices with the best irrigation practices for the type of crops being grown.

Irrigation is also taking place in the upper catchments of the Mbashe key area including the Ncora Irrigation Scheme. In the Mbashe key area, the irrigation infrastructure is not functional resulting in approximately 50% of the water supplied to the field edge being lost in the case of the Ncora Irrigation Scheme. The lack of institutional capacity and managerial competence is further exacerbating the water losses from the irrigation scheme. A WUA has not yet been established for the area and no water management plans for the scheme are available.

There are other smaller irrigation schemes in former RSA areas of the Mzimvubu to Mbashe ISP area around Maclear. The irrigation practices for these schemes are not known. They need to be investigated to determine whether there is potential for implementation of best irrigation practices.

The provincial department of agriculture is also in the process of rehabilitating the small irrigation schemes in the former Transkei, including the Magwa tea plantations.

STRATEGIC APPROACH

The efficent use of water in the irrigation sector can be achieved if there are incentives given for irrigators to save water. This can be done by encouraging farmers to trade excess water they can make available from using efficient methods. Although the Mzimvubu to Mbashe ISP area has abundant water resources, the

MANAGING DEMAND IN THE IRRIGATION SECTOR	
priciples of trading water should be promoted. The proposed strategy is to encourage trading of water within and across sectors. This will provide the incentive for farmers to utilise their water efficiently and be able to trade the savings from efficient utilisation to other users.	
PRIORITY Low	
MANAGEMENT ACTIONS	RESPONSIBILITY
1. DWAF must identify the current water-use practices in the irrigation sector of the Mzimvubu to Mbashe ISP area.	DWAF Regional Office
2. DWAF must ensure that the guidelines and the best water-use practices for the irrigation sectors are publicised and communicated to the irrigators. The irrigators should be aware of how to develop the water management plans.	DWAF Regional Office
3. Encourage metering in the irrigation sector. Review pricing of irrigation water, taking into account efficiency and equity considerations.	DWAF Regional Office

STRATEGY NO 5: INSTITUTIONAL STRENGTHENING AND SU PPORT

THE NEED FOR AN INSTITUTIONAL DEVELOPMENT AND SUPPORT STRATEGY

In accordance with section 78 of the Water Services Act (Act No.108 of 1997), the Department of Water Affairs and Forestry (DWAF) has to transfer the water infrastructure to Local Authorities who have been designated Water Services Authorities. There is a requirement that Local Authorities and DWAF interact in the management of existing water supplies and in planning for new and additional water supplies in order for both parties to know and understand the opportunities and constraints of the available water resources. This interaction and sharing of knowledge should be reflected in the IDP and WSDP that are the responsibility of the Local Authorities. Due to the lack of skilled and experienced manpower within many of the LAs and their advisors, this has often not been the case. The result is that many IDPs and WSDPs that have been produced to date contain fundamentally wrong information and proposals that do not take account of the constraints and opportunities imposed by the available water resources. As a result these programmes, which are being adopted by the LAs will in many instances not be successful, resulting in much wasted effort and wasting of scarce resources. There is an urgent need for DWAF to proactively provide institutional support to the LAs in terms of closing the knowledge gap that presently exists, thereby ensuring that LAs (councillors and officials) and their technical advisors know and understand the limitations to water supply in their areas.

At a national level this overall strategy includes support for the formation of Catchment Management Agencies (CMAs) and Water User Associations (WUAs). These are national functions with national strategies and policies in place.

This ISP strategy addresses institutional support for development of water supplies to Local Authorities.

10.2 RELEVANT IDENTIFIED STRATEGIES

The following strategies form a part of this overall strategy:

5.1 Institutional Strengthening of Water Services Institutions

Strategy No 5.1

INSTITUTIONAL STRENGTHENING OF WATER SERVICES INSTITUTIONS

MANAGEMENT OBJECTIVE

The objective of this strategy is to ensure that the transfer of DWAF water infrastructure assets to Local Authorities (LA) that have been designated Water Services Authorities is done in a sustainable manner. IDPs, WSDPs, Water Sector Plans and water feasibility plans should reflect the opportunities and constraints in these LA.

SITUATION ASSESSMENT

The water supply situation in most of the towns in the ISP area is currently adequate with exceptions described under each key area.

Since the establishment of District Municipalities as Water Service Authorities, DWAF is now in the process of transferring the water infrastructure assets to these authorities. the meantime other Local Municipalities have been designated Water Services Authorities. This has caused some conflicts between the investigations for additional or new water supplies to local authorities that have been undertaken by the District and Local Municipalities using technical advisors (consulting engineers). In most cases the capacity and water management expertise in the DM and LM is insufficient. When requested, DWAF regional office staff has assisted municipal officials in compiling acceptable programmes and plans. However, in many cases this has not happened and unacceptable proposals for water supply options are often recommended for implementation by municipal officials, i.e. there are often insufficient raw water resources available or there are competing interests requiring the same source. This only becomes known when applications are made to DWAF for water licences. This gives the appearance that DWAF is delaying what are often seen as urgent and necessary water supply schemes and leads to misunderstanding and a breakdown in co-operative governance.

Local and District Municipalities are mostly unaware of provincial and national priorities when producing their IDPs and WSDPs. Until these documents are completed to an acceptable level of accuracy and detail, the information regarding the anticipated future water requirements and sources of supply for local authorities remains uncertain. Support requested and given by DWAF at the initial stages of compiling the WSDP's would overcome many of the problems encountered with the WSDP's to date. Often the fault lies with inexperienced consultants appointed by the LAs.

Many LAs obtain all or a portion of their water requirements from schemes which they own and operate. These LAs are often unaware that they must consult with DWAF, as the government department responsible for the management of the water resources, before making or approving recommendations regarding water supplies. In addition, there is

often a general lack of capacity within many LAs to participate and to take responsibility for their mandate.

The following issues and concerns have been identified:

- The water infrastructure can become a liability to local municipalities because of the capacity constraints. DWAF needs to ensure that the transfer of assets is done in conjunction with the development of capacity in these Local Municipalities particularly at management level. Services have been upgraded in most small towns under the CMIP programme. This programme has now been integrated into the Municipal Infrastructure Grant (MIG).

DWAF and the District and Local Municipalities do not have an adequate process of interaction, information sharing and co-operative governance.

STRATEGIC APPROACH

The strategic approach for DWAF is to work with each LA in the development of institutional capacity for the LA to be able to manage the assets being transferred to them by DWAF. This approach must promote up-front liaison and agreement between DWAF and the LA regarding the transfer of assets.

DWAF's strategy should be to ensure that the WSDPs that are developed by the Local Authorities are aligned with the ISP, NWRS and Catchment Management Plans. WSDPs should highlight water conservation and demand management measures proposed by the LA in addition to current sources of supply and future anticipated sources of supply. Future planning should consider applicable social, environmental and economic impacts and costs.

The RO must identify outstanding WSDPs and ensure that they are submitted timeously. They must review the IDPs, WSDPs and Water Sector Plans and provide feedback to the relevant LAs to ensure that proposals conform to DWAF requirements. IDPs and WSDPs must become the documents that reflect the total municipal water strategies.

The LAs should be encouraged at every available forum, committee or other venues jointly attended by DWAF and and the LAs to first pursue alternative augmentation options, such as water demand management, effluent reuse, water trading or eradication of alien plants in water-stressed areas before applying for additional surface or groundwater use. Where future water supplies have not been identified in the WSDPs, further feasibility studies must be undertaken by the LAs.

An approach and strategy for water supply must be developed for each town. There is a very real need to assist with building capacity at District and Local Municipality level.

MANAGEMENT ACTIONS	RESPONSIBILITY

INSTITUTIONAL STRENGTHENING OF WATER SERVICES INSTITUTIONS		
1.	The RO must review the WSDPs and follow up with the LAs in cases where plans submissions are incomplete or have not been submitted. The RO must pro-actively assist the LAs with regard to development of water supply schemes and water demand management investigations and implementation programmes.	All Directorates in DWAF Regional Office.
2.	Update the data of all municipal water sources, requirements, issues and future augmentation plans etc as contained in this Strategy. Advise LAs and their technical advisors to interact upfront with DWAF before finalising water supply options.	DWAF Regional Office
3.	Request D: WUE at DWAF Head Office and the regional WC division to assist LA to overcome the technological barriers many of the local municipalities in the area face with the development and implementation of WC/DM strategies.	DWAF Regional Office
4.	Aim to improve borehole monitoring and ensure that water management plans are compiled. Directorate: Information Programmes and RO Hydrological Information Sub-Directorate must investigate this and compile a strategy to deal with the situation.	DWAF Regional Office
5.	Co-ordinate with the OR Tambo, Chris Hani, Alfred Nzo, Ukhahlamba and Sisonke DMs on the further studies into future water supply options to their areas.	DWAF Regional Office

STRATEGY NO 6: SOCIAL AND ENVIRONMENTAL

THE NEED FOR SOCIAL AND ENVIRONMENTAL STRATEGIES

Water for poverty eradication, for equity, and as a generator for economic growth is a major focus of both central and provincial government that will be pursued under this strategy. In addressing imbalances of the past, the provision of an equitable share of available water to previously disadvantaged communities is being addressed to improve the livelihoods of the poor. The establishment of resource-poor farmers, and the provision of water to areas in which land restitution is in progress, must be prioritised as one of the ways to reduce poverty. The water reconciliation for the ISP area has shown that water is available for allocation to resource-poor farmers ,especially in the former Ciskei and Transkei homeland areas where new and revitalised irrigation schemes are being established. This strategy will support the recent Eastern Cape Provincial Government's Growth and Development Strategy.

RELEVANT IDENTIFIED STRATEGIES

The following specific strategy has been developed further:

6.1 Poverty eradication, resource-poor farmers and revitalising of small irrigation schemes.

Strategy No 6.1

POVERTY ERADICATION, EMERGING FARMERS AND REVITALISING OF IRRIGATION SCHEMES

MANAGEMENT OBJECTIVE

The objective of this strategy is to provide support to the Provincial Government's poverty eradication and food security objectives outlined in the Eastern Cape Provincial Growth and Development Strategy (PGDS), which identified poverty eradication as having the highest priority.

SITUATION ASSESSMENT

The Mzimvubu to Mbashe ISP area largely comprises the former homeland of Transkei. The socio-economic baseline that was recently carried out by Edwards (2003) indicates that there is widespread and deep poverty with an estimated 67% of the population of the Eastern Cape below the poverty line (defined in terms of income). The majority of this population is located in the former homeland areas of the Ciskei and Transkei, which are mainly rural.

The underdevelopment of the agricultural potential of the province is both a cause and effect of the poverty that exists. At provincial level the sustainable development of the "abundant" natural resources of water and land has been identified as one of the main keys to poverty eradication. As such, food security has been prioritized and will be addressed through household food production programmes and increased support to black commercial farmers through credit and low interest loans, additional land etc (the Massive Food Production Programme and the Integrated Rural Development Programme).

The PGDS 2004-2014 in the Eastern Cape embodies the following:

- A clear vision for the long-term development in the former homeland of Transkei situated in the Mzimvubu to Mbashe ISP area.
- A quantified vision and sequenced targets for economic growth, job creation, poverty eradication, human development and institutional transformation
- A 10-year strategy for Provincial Growth and Development, identifying priorities and key programme thrusts.

DWAF is co-operating with other departments to ensure that the management of water resources can contribute to the strategic framework for growth and development, with particular emphasis on interventions to reduce poverty and increase food security.

POVERTY ERADICATION, EMERGING FARMERS AND REVITALISING OF IRRIGATION SCHEMES

Interventions under the Integrated Rural Development Programme (IRDP) include:

- Modifying water resource management programmes and priorities to align with the priority areas identified for the IRDP.
- 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 allocating water. In particular, identifying potential rural users, in addition to registered users, in calling for licence applications during 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.

The following mechanisms exist to alleviate poverty in terms of the broader Water for Equity approach:

- Providing subsidies to resource-poor farmers in terms of the DWAF pricing strategy.
- Assistance to small towns and rural settlements for general access to water.
- Creation of employment opportunities under the Working for Water and Working for Wetlands programmes.
- Assistance to farm workers, such as extension service, management support, etc.

The following national issues and concerns have been identified regarding resource-poor farmers and rural settlements:

- The process to implement schemes for resource poor farmers is a lengthy one.
- DWAF provides access to water but land acquisition falls under other authorities (Department of Land Affairs and Department of Agriculture).
- DWAF can only subsidise farmers who are included in WUA's or other recognised water management institutions.
- Capital costs to acquire existing farms or to establish infrastructure on new land is high.
- Land reform has not been overly successful to date.

A number of initiatives in this ISP area have already been started by the Provincial Department of Agriculture and the District Municipalities. DWAF is assisting with these initiatives through the CCAW by rehabilitating the irrigation systems and, providing financial and resource support to these organisations. Most of these schemes are centred on irrigation projects and bulk water supply schemes and dams that were originally implemented

under the former Ciskei and Transkei homeland governments. During the political transition period of the mid 1990's, most of these schemes fell into disuse with very little farming activity taking place. With the adoption of a new provincial strategy, which identifies poverty alleviation and self-sufficiency in food as one of its main goals, major emphasis is now being place on rehabilitating these schemes, either partially or wholly.

The following schemes have been identified for possible subsidy assistance by DWAF and the Provincial Department of Agriculture and an investigation study is presently underway:

- Ncora Irrigation Scheme Extension, which consists of a potential further 1 000 ha of irrigable land being developed, as well as the development of 2 000 ha in the Qumanco region. The feasibility of these extensions depends on the water availability from the Ncora Dam.
- Possible small schemes in the Lower Mzimvubu catchments near Port st Johns.
- Mngazi Irrigation Scheme.
- A number of small-scale irrigation schemes exist in the ISP area. Most of these schemes have fallen into disrepair since government began withdrawing from irrigation as part of the Irrigation Management Transfer (IMT) to farmers. Most of these schemes were provided management support by ECATU which has since been disbanded.

STRATEGIC APPROACH

DWAF has prioritised water for equity, but not at the expense of efficiency and beneficial use. DWAF supports the PDoA in providing water for resource-poor farmers provided the water is available and allocations have been prioritized. This requires close co-operation between DWAF and the PDoA.

DWAF will honour the allocations made to irrigation schemes and supports the revitalization of existing but defunct schemes. This should take into account the following:

- Alternatives to allocating and distributing this water to a wider spread of the population for more effective poverty relief should be examined.
- Irrigation schemes which will clearly never be viable and where water and investment will be wasted should not be revitalized. DWAF and the PDoA should reach consensus on such schemes as a matter of urgency.

PRIORITY

Very High

POVERTY ERADICATION, EMERGING FARMERS AND REVITALISING OF IRRIGATION SCHEMES	
MANAGEMENT ACTIONS	RESPONSIBILITY
The needs of prioritised resource-poor farmers should be addressed through the CCAW, through co-operative governance between DWAF, the Department of Land Affairs, the Department of Agriculture, appropriate District Municipalities and DAET as follows:	
1. Identification of areas where it may be possible to develop and sustain resource-poor farmers in the ISP area, especially those areas where bulk water supplies (and dams) are in place with existing water rights.	DWAF Regional Office ICW
2. Identification and short-listing of schemes by the CCAW for further evaluation. The District Municipalities must be requested to provide information on potential small and large-scale irrigation developments identified in their areas, including the requirements for home gardens. DWAF will provide the water resource availability scenario to aid the identification process.	Provincial Department of Agriculture
3. Evaluation of the short-listed and prioritised schemes through planning studies to determine the feasibility of the schemes.	Provincial Department of Agriculture
4. Develop ways in which appropriate relevant information regarding water requirements and water availability can be effectively assessed and expressed in a structured way to the CCAW. A protocol for a structured sharing and transfer of information, particularly between DWAF, the PDoA and the District Municipalities, regarding potential resource-poor farmer (and commercial) irrigation developments and required water resources must be implemented.This can be done by ensuring an effective functioning Provincial Liaison Committee.	DWAF Regional Office
5. Develop ways in which the irrigation development needs of the PDoA in line with the provincial economic development strategy and various priority lists can be effectively communicated to the CCAW in a structured way	DWAF Regional Office
6. Attach a high priority to the forming of WUAs where the needs of resource-poor farmers have been prioritised, once the schemes have been proven to be sustainable.	DWAF Regional Office
7. Arrange payment of a subsidy to the WUAs once they are established and assist with the sourcing of such funds if necessary according to the procedure for funding and construction of such schemes, as devised by D: WU.	DWAF Regional Office

STRATEGY NO 7: INTEGRATION AND CO-OPERATIVE GOVERNANCE

THE NEED FOR INTEGRATION AND CO-OPERATIVE GOVERNANCE STRATEGIES

This strategy addresses co-operative data collection, information sharing, sharing of visions and plans, and co-operative making of joint decisions which are satisfactory or at least acceptable to all parties. The ISP strategies interface with those of other central and provincial government departments, local authorities and water service providers. Consequently, there is an inherent need for establishing co-operative relationships with such organisations. This is required to ensure that management and control of the water resources in the ISP area are integrated with the relevant strategies of other organisations, whilst meeting the requirements of particular legislation with which it must comply.

The Integration and Co-operative Governance Strategy is required to address:

- ⇨ Regional, local and sector-specific co-operative governance.

10.3 RELEVANT IDENTIFIED STRATEGIES

The following specific strategy has been developed further:

7.1 Co-operative governance

Strategy No 7.1

CO-OPERATIVE GOVERNANCE

MANAGEMENT OBJECTIVE

To improve co-operation and co-ordination between DWAF personnel and other authorities regarding information sharing and decision-making and thereby achieve improved management of the water resources in the Mzimvubu to Mbashe ISP area.

SITUATION ASSESSMENT

Due to the integrated nature of water resource management, co-operative governance is linked to all of the strategies discussed in the ISP. Furthermore, land-affairs issues, land-use issues and marine issues are all related to water resources in one way or another. Consequently, the effective and efficient management of water resources requires co-operation between DWAF, other government departments and local authorities and parastatals such as Eskom and Water Boards.

In the spirit of good co-operative governance, the DWAF Regional Office has been involved with:

- Liaison with DEAET, the Department of Agriculture and local authorities through the Stream Flow Reduction Activities Licence Assessment Advisory Committee (SFRA LAAC).
- The existing Wetlands and Riparian Zone Delineation Policy Committee between DWAF and DEAT.
- The existing Provincial Liaison Committee and its sub-committees, such as the CCAW involving DWAF, the Department of Agriculture, DEAT and the Department of Land Affairs.
- The existing Integrated Water Services Management Forum.

The generic issues and concerns relating to co-operative governance requirements are identified as follows:

- The need for co-operative governance in the sharing of information and approval and licensing of all water related activities.
- Delays caused by the lack of capacity, finances or lack of knowledge on the part of officials within different government departments.

There is a need to consolidate data information systems in the region and improve the sharing of water-resource related information (and other information) between government departments, local authorities and institutions to avoid duplication of effort in an area with a scarcity, skilled manpower and financial resources.

The management and operation of purification, wastewater treatment works and solid waste sites by local authorities in order to meet the standards and requirements set by DWAF.

Pollution of rivers and the marine environment due to inadequate and/or poorly maintained and operated infrastructure services under the control of local municipal authorities.

The need for co-operative governance between WfW and DEAT regarding the benefits of clearing of invasive alien plant.

The following issues and concerns relating to co-operative governance in the Mzimvubu to Mbashe ISP area have been identified:

- The need for co-operative governance relating to pollution in the Mtata River due to overflow of effluent discharges and the stormwater runoff.
- Sedimentation of rivers and dams due to land ownership and poor land use practices, especially in the former Transkei components of the ISP area.
- The need for improved co-operation between DWAF, DLA, PDoA and DEAT for the management of wetlands, marine environments and estuaries, soil conservation and invasive alien plant control programmes.
- The need for alignment between the Eastern Cape Provincial Growth and Development Strategy, the IDPs and WSDPs and the ISP.
- The need to align DWAF programmes with the four Integrated Sustainable Rural Development programme nodes namely the Alfred Nzo, OR Tambo, Chris Hani and Ukhahlamba District Municipalities which are home to both the deepest poverty and areas of rich natural resources.
- Need for groundwater representation on the CCAW because of the lack of co-ordinated drilling, often taking place unknown to DWAF.

STRATEGIC APPROACH

Promote the effective management and co-ordination of water resources in the ISP area through co-operation between DWAF, other government departments, local authorities and parastatals. Continue involvement in the various co-operative management bodies already established, and ensure active involvement in new liaison bodies that are being or will be established to contribute towards improved water management.

PRIORITY High	
MANAGEMENT ACTIONS The following specific actions are required to address issues and concerns in the ISP area:	RESPONSIBILITY
1. Study and provide feedback on the Provincial Situation Assessment and Provincial Strategy framework recently undertaken by the Eastern Cape Provincial Government.	DWAF Regional Office
2. Arrange a meeting between DWAF and DEAT to establish a permanent co-operative liaison body for improved co-ordination and information sharing regarding the management of wetlands, estuaries, marine environments and invasive alien plant control programmes.	D: NWRP & DWAF Regional Office
3. Arrange a meeting between DWAF and PDoA to initiate co-ordination regarding land-use issues and soil conservation programmes.	DWAF Regional Office
4. Establish a co-operative initiative with local authorities and the Department of Housing and Local Government especially with respect to planning for future water needs and water conservation and demand management.	DWAF Regional Office
5. Develop and implement an action plan to ensure that all infrastructure planning processes that impact on water resources are aware of DWAF requirements.	DWAF Regional Office
6. Develop and implement an action plan to ensure DWAF input and requirements for IDPs and WSDPs during compilation.	DWAF Regional Office
7. Ensure groundwater representation on the CCAW.	DWAF Regional Office

STRATEGY NO 8: MONITORING AND INFORMATION MANAGEMENT

THE NEED FOR MONITORING AND INFORMATION MANAGEMENT STRATEGIES

The National Water Act requires the Minister to establish monitoring systems for water resources to collect appropriate data and information. As part of the national Monitoring and Information Strategy which forms part of the NWRS, the Department is addressing the inadequacies and shortcomings of the current arrangements by amalgamating all existing and planned monitoring and assessment systems into a structured and coherent monitoring, assessment and information management system. This system and the data captured on water availability, water use and water quality is required for effective and efficient management of an increasingly scarce resource.

Monitoring is required to ensure compliance with water authorisation conditions and licensing, to control all water use and also for billing and revenue collection.

- The Monitoring and Information Management Strategy is required at a National, Water Management Area and Catchment level to:
- Improve monitoring networks and data capturing for water use control (availability, allocations, licensing and revenue collection)
- Obtain and capture accurate data on the physical, chemical and biological aspects relating to surface and groundwater resources (quality)
- Improve on efficiencies in gathering of information, particularly through institutional co-operation in data capture and management
- Set and maintain standards for the capture, processing and management of accurate data information
- Ensure that information systems are easily accessible both within DWAF and to outside stakeholders without compromising data security.

RELEVANT IDENTIFIED STRATEGIES

The following specific strategies have been developed further:

8.1 Monitoring networks and data capture
8.2 Information management

Strategy No 8.1

MONITORING AND INFORMATION MANAGEMENT STRATEGIES

MONITORING NETWORKS AND DATA CAPTURE

MANAGEMENT OBJECTIVE

The installation of effective national and regional monitoring networks and the accurate population of databases to ensure sustainable water use (monitor the balance between availability and requirements), to ensure the control and billing of water use, maintain the resource base by ensuring the maintenance of ecosystem health (Reserve) and to ensure the protection of surface water resources and groundwater (water quality).

SITUATION ASSESSMENT

The National Water Act requires the Minister to establish national and regional monitoring systems for water resources to collect appropriate data and information necessary to assess the following:

- The quantity, quality and use from and effluent return to surface and groundwater resources
- The rehabilitation of water resources
- Compliance with resource quality objectives
- The health of aquatic ecosystems
- Atmospheric conditions which may influence water resources
- Other data necessary for the management of water resources such as billing and tariff calculations

To meet the requirement for detailed integrated information, DWAF is currently reviewing, and revising at a national level, all data-acquisition, monitoring and information systems.

In addition to national networks required for assessing water availability and use, the following national water quality monitoring networks are required:

- National Chemical Water Quality Monitoring Network
- National Microbial Monitoring Network

MONITORING NETWORKS AND DATA CAPTURE

- National Eutrophication Monitoring Programme
- National River Health Programme
- National Toxic Monitoring Programme
- National Radioactivity Monitoring Programme (is being tested)
- National Estuarine Monitoring Programme (is planned).

Monitoring networks and data capture on water use aspects within the Mzimvubu-Mbashe ISP area are far below optimal, especially in the former Transkei areas, due to under-resourcing. Very little monitoring by DWAF of water use from surface water resources to small towns is done in the region. Monitoring is mainly undertaken for those supplies from DWAF owned dams or those for regional water supply schemes originally funded by DWAF.

The location and status of monitoring boreholes of small towns and coastal villages is poorly documented. Actual groundwater abstraction information is also generally not available from these towns and villages. In most instances officials responsible for these schemes do not have the technical expertise or capacity to do groundwater monitoring over an extended period and DWAF lacks the capacity to adequately undertake such monitoring on their behalf.

Flows in rivers are monitored at national monitoring stations. The number of operational flow monitoring sites, where flow is measured at reservoirs, at transfer schemes, at major irrigation schemes and at estuaries needs to be greatly expanded.

Within the former RSA component of the area, the regional hydrological data capture systems and databases are generally regarded as being the minimum acceptable to regional DWAF staff (monitoring and capturing of rainfall, evaporation, surface water, ground water and water quality). The available information and monitoring systems and resources to capture data are however not acceptable. Previous attempts at establishing sustainable GIS capacity in the region have failed. There is a lack of skilled personnel within DWAF and within the municipalities to undertake adequate monitoring, together with a lack of funds to increase monitoring points at an acceptable rate. This situation is worse for the former Ciskei and Transkei areas. An example is that of water quality samples, which are taken monthly by DWAF and not every two weeks, due to a lack of manpower and financial resources.

Water quality monitoring is sparse and sporadic throughout the area due to a lack of skilled manpower resources, both at the regional (DWAF) level and at the local (municipal) level. The near to pristine nature of many of the rivers and estuaries in the area and their important role in the region with regards to biodiversity, fish breeding and recreational activities and tourism requires that improved and expanded monitoring systems be formulated. As the overall responsible authority for the water quality of the rivers, it is incumbent on DWAF to ensure that all rivers are adequately monitored, either by DWAF personnel or by local municipal authorities.

The Mtata River is being polluted heavily by discharging effluent which is not up to the water quality standards.

MONITORING NETWORKS AND DATA CAPTURE

This has resulted in cholera outbreaks in the area although it was established earlier that a detailed monitoring and data collection programme is urgently required in order to identify the impacts and institute steps to improve the health of the rivers.

Both national and regional monitoring systems are spatially inadequate and operate largely in isolation of each other. Whilst DWAF is actively working to structure its systems into a single "Monitoring, Assessment and Information System (MAIS)", this strategy will need to address networks and funding, staff capacity, and co-operative relationships with other organisations.

The current resources in the RO to implement this strategy are inadequate. This result in monitoring only of perceived critical data at intervals that is too long.

There is a lack of monitoring of the area of the Mzimvubu key area that is currently managed by the KwaZulu – Natal Regional Office. The monitoring of this area should be incorporated into the overall monitoring programme of the Mzimvubu to Keiskamma WMA.

STRATEGIC APPROACH

The strategy is for DWAF to ensure that the monitoring of water resources, both quantity and quality, in the Mzimvubu – Mbashe ISP area, with water quality monitoring particularly in the Mtata key area, is conducted. Manpower and financial resources are severely limited and the Department will have to invest heavily in monitoring if it is to fulfil its requirements as mandated under the NWA.

The implementation of an adequate monitoring programme will require the installation of significant new equipment and infrastructure e.g. weirs etc, a major increase in staff capacity, the bringing of all water quality monitoring up to standards, with an emphasis on potential crisis areas.

Many different organizations are involved in monitoring and the first step for DWAF will be to co-ordinate these disparate organizations. At the same time this will require DWAF to share data and information.

PRIORITY

Medium to High.

MANAGEMENT ACTIONS	RESPONSIBILITY
Develop a detailed regional strategy that is compatible with the national information system for the monitoring needs of the ISP area by undertaking the following generic actions: 1. Establish a regional task team and review or identify all aspects that need to be monitored. Group all monitoring needs into logical systems with common goals according to functional areas, which are then divided further into sub-systems. This will include but not	The development of this strategy is the responsibility of the RO in consultation with

be limited to: ❑ Hydrology (rainfall, climate and streamflow) ❑ Geohydrology (groundwater) ❑ Inflows and outflows (transfers) ❑ Abstractions (Water users, dam levels, operational releases, losses etc) ❑ Water quality (surface and groundwater) ❑ Return flows ❑ Waste water outflows ❑ River health ❑ Sedimentation ❑ Small farm dams (numbers, capacity and use) ❑ Land-use changes (agricultural cropping, forestry, invasive alien plants) 2. Develop a detailed information requirement and monitoring needs assessment for the various systems, which are grouped by functional areas. 3. Prepare a set of standards for monitoring and data capture which must cover accuracy, completeness, time scales and time frames, information sharing etc. 4. Identify and motivate for additional monitoring points or functions required for the ISP area in a phased implementation manner, based on priorities. 5. Amalgamation of the identified existing and planned monitoring and assessment systems needs into a coherent and structured monitoring, assessment and information system. 6. Review staff resources required for adequate monitoring of surface and groundwater and employ, develop and train additional staff where identified. 7. Motivation for the regional share of the national monitoring budget. 8. Develop regional co-operative, collaborative relationships between DWAF and other organisations that have relevant data or operate water-related monitoring, assessment and information systems. This should include a plan for storage and sharing of mutually useful information. 9. Regularly review and update the regional monitoring strategy. 10. Ensure that the Mtata River is regularly monitored upstream of the Mtata Dam and downstream below the First and Second Falls dams. 11. Co-ordinate and prioritise monitoring and implementation of groundwater supply,	the RDM office and the Directorates of Information Programmes, Waste Discharge and Disposal and the IWQS. Co-operative governance liaison should be developed with the provincial departments of Local Government, Health and the District Municipalities.

MONITORING NETWORKS AND DATA CAPTURE	
spring protection and borehole remediation with the sanitation programme. 12. Define the method and establish guidelines acceptable to theSABS for monitoring at springs (water quality and flow). 13. Integrate the surface, groundwater and ecological monitoring in NWA context, particularly at the coastal and spring localities. 14. Outsource the monitoring and data processing as required rather than delay implementation. *Surface water monitoring:* Continue existing monitoring and data-capturing systems and identify the need to install additional rainfall, flow or estuarine recorders. *Groundwater monitoring*: Build capacity, especially at local authority level. Additional staff is also urgently required in the RO. *Water quality monitoring*: This was largely addressed in the *Water Quality Management Strategy*, which also dealt with water quality monitoring needs. *Coastal and marine monitoring* is required and assistance should be obtained from the Coastal and Marine Research Institute of Port Elizabeth and/or the South African Institute for Aquatic Biodiversity in Grahamstown. These two organisations could be part of a co-operative governance effort.	

Strategy No 8.2

INFORMATION MANAGEMENT

MANAGEMENT OBJECTIVE

Facilitate improved storage, manipulation, backup, archiving, dissemination, access to and sharing of information within the ISP area and WMA.

SITUATION ASSESSMENT

National systems will be designed so that Catchment Management Agencies, once 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, at 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. The Minister is required by the NWA to establish the following national information systems:

a. Surface Water Hydrology

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

b. 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 Head Office and one Regional Office. The system is expected to be fully operational throughout the Department in 2007.

c. 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, the impacts of abstraction, and the impacts of aquifer contamination. The system was installed in the Department's National Office and three Regional Offices by the end of 2002, and will be fully operational in all Regions by 2004.

d. 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.

e. 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.

The following monitoring strategy issues and concerns were identified in the Mzimmvubu to Keiskamma WMA :

- The need to share information, responsibilities, databases and other related issues and actions.
- Inability of the WARMS to handle water-use queries per catchment area.
- The *Water Quality and Quantity Water Management System* (WMS) will supersede the *Pollution Monitoring and Capture System* (POLMON).

The following information management related issues and concerns were identified:

- There is ongoing capturing according to priority in the registration process. Data of some water users and solid waste sites have not yet been captured.
- There is an ongoing mapping project that captures data on invasive alien plants.
- There was a loss of captured solid waste site data in the RO due to inadequate backup facilities. Only 20% of solid waste sites are now populated in the *Waste Manager* programme (waste permit information).
- There is an urgent requirement for adequate data storage, backup and archiving systems for captured data in the Eastern Cape Regional Office.
- The availability and retention of suitably trained and qualified staff is a problem.

The current resources in the RO to implement this strategy are inadequate. Skilled IT and GIS staff, funds to buy and properly manage the software and databases and technical staff to evaluate, manage and improve the systems and databases and to liaise with other information managers are required. The available staff is very stretched and address issues according to priorities (reactive and crisis management). The most important activity is thus to increase skilled manpower resources. Restructuring is currently under way in the RO, which is a difficult time to increase resources, but is also an opportune time to divert appropriate resources to information management, which in the past generally seemed to be undervalued in importance.

INFORMATION MANAGEMENT	
STRATEGIC APPROACH Data is valuable and expensive, and adequate systems and staff must be provided to ensure the accurate capture and storage, retrieval processing and dissemination. The Department recognizes the inadequacies of the current monitoring and information systems and proposes that an Information Management Plan be instituted through this ISP.	
PRIORITY Priority 2 – High. Implement over the medium term.	
MANAGEMENT ACTIONS	RESPONSIBILITY
Compile an ISP area Information Management Plan as follows: Identify what information the Departmental information managers require. Determine GIS specific requirements such as hardware for storage. Identify information requirements from other departments, provincial and local government and other organisations. Compile an information sharing policy with other departments, provincial and local government and other organisations and identify the following: • What information should be shared? • Who should have access to it? • What is the integrity of the information to be shared? • With whom is sharing of information beneficial? Implement the information sharing policy through co-operative governance with other departments, local authorities and institutions through various formal and informal committees or other forms of effective co-operation. Re-capture waste-related permit information in *Waste Manager*. Install adequate storage, backup and archiving facilities and library systems in all the DWAF Eastern Cape Regional Offices.	A new Chief Directorate Scientific Services will be created to take overall responsibility. The development of the regional strategy is the responsibility of the RO.

INFORMATION MANAGEMENT	
Formulate an approach to deal with available WARMS information. Integrate the data, information and knowledge of previous studies into a WMA data base with data and information accessible at a quaternary catchment scale. Ensure that Geohydro has an updated list of all current projects in the area regardless of funding agent and receives the necessary feedback to update data base. Initiate a study to evaluate the existing geochemistry data base of Karoo rocks in order to short-list relevant trace elements to be monitored, particularly those that pose a health risk, such as arseno pyrites and fluoride. Establish the unexploited groundwater on an aquifer-specific basis per quaternary. Evaluate the potential to expand existing groundwater supply schemes and additional schemes for rural empowerment and poverty relief programmes in the light of the above and improved groundwater exploration practice as well as agricultural potential.	

REFERENCES AND REPORTS

1. Department of Water Affairs and Forestry, South Africa. 2004. National Water Resource Strategy First Edition.

2. Department of Water Affairs and Forestry, South Africa. http://www.dwaf.gov.za website

3. Department of Water Affairs and Forestry, South Africa. 8 October 1999. General Authorisations in terms of Section 39 of the National Water Act. Government Notice No. 1191.

4. Department of Water Affairs and Forestry, South Africa. 1999. Pricing strategy for raw water use.

5. Department of Water Affairs and Forestry, South Africa. February 2003. Undertaking Reserve determinations at various levels for the various freshwater bodies. Latest available comprehensive set of documentation.

6. Department of Water Affairs and Forestry, South Africa. February 2003. Vision and Mission Statement for Managing Water Resources in South Africa.

7. Department of Water Affairs and Forestry, South Africa. 2003. Eastern Cape Regional Office staff personal interviews.

8. JLB Smith Institute of Ichthyology. November 2001. A Survey of Selected Eastern Cape Estuaries with Particular Reference to Ichthyofauna. Ichthyological Bulletin No. 72.

9. Midgley, Pitman and Middleton. 1994. *Surface Water Resources of South Africa*: 1990. Water Research Commission Report No. 298/5.1/94.

10. National Water Act, 1998, Act 36 of 1998. Gazette No. 19182

11. National Environmental Management Act, Act 107 of 1998.

12. Ninham Shand. June 1999. *Eastern Cape Water Resources Situation Assessment*. Prepared for the DWAF. Report No PWMA 12/000/00/0101

13. Provincial Government of the Eastern Cape. June 2003. Strategy Framework for Growth and Development 2004 – 2014. Draft 8 (Approved).

14. South African Institute for Aquatic Biodiversity (AK Whitfield). Available Scientific Information on Individual South African Estuarine Systems.

15. Water Services Act, Act 108 of 1997.

16. Department of Water Affairs and Forestry, South Africa. 1998. *Mtata River Catchment. Framework Plan for the Development of a Catchment Management Strategy*. Ninham Shand (Pty) Ltd. Ninham Shand Report No. 8330/2912.

17. Department of Water Affairs and Forestry, South Africa. 2001. *Mtata River Basin Study*. FST Consulting Engineers in association with WRP. Report No P T200-00-1300.

18. Department of Water Affairs and Forestry, South Africa. 2004. Government Gazette No. 398: General Authorisations in terms of Section 39 of the National Water Act, 1998 (Act No. 36 of 1998).

19. Department of Water Affairs and Forestry, South Africa. 2004. Government Gazette No. 1227: General Authorisations in terms of Section 39 of the National Water Act, 1998 (Act No. 36 of 1998).

20. Republic of Transkei, Department of Works and Energy, 1990. *Mzimvubu Basin Development Study* Report No T300,XX/0990

21. Department of Water Affairs and Forestry, 2003. Overview of *Water Resources Availability and Utilisation* Report No PWMA 12/000/00/0203

22. Department of Water Affairs and Forestry, 2004. *Economic Information System. Urban Econ Development Economists. Eastern Cape Province Macroeconomic overview* Report No P RSA/00/15/00 July 2000

23. Department of Water Affairs and Forestry, 2002. *Population and Economic Scenario System. Urban Econ Development Economists*. MarkData in association with Eric Hall & Associates, STATOMET, PD Naidoo and Knight Piesold Report No P RSA/00/2200

24. Department of Water Affairs and Forestry, 1994. *Vaal Augmentation Planning Study* Report No C000 VAPS

25. Department of Water Affairs and Forestry, 2004. *Eastern Pondoland Basin Study*. UWP Consultants Report No PB T 600-00-0101

26. Department of Water Affairs and Forestry / King Sabata Dalindyebo Municipality, 2002. Status Quo Assessment and Pressure Management Pilot Study for the development of a water demand management strategy for KSD Municipality. WRP Consulting Engineers.

27. Ninham Shand, 2004. Kokstad Water and Wastewater.

28. Water Research Commission, 2004. Investigation of different farm tenure system and support structures to establishing small-scale irrigation farmers in long-term vaibale conditions. Tlou & Matji (Pty) Ltd.

29. Sellick, C., pers. comm, Charles Sellick and Associates, Cape Town, South Africa, July 2004.

30. Eastern Cape Province *Mzimvubu River Basin water utilization opportunities* October 2004 Report No P RSA/00/15/00