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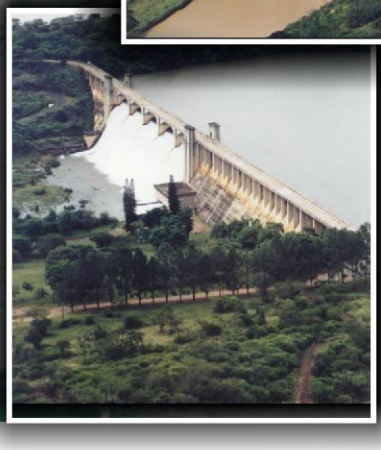
Water Reconciliation Strategy Study for the Kwazulu Natal Coastal Metropolitan Areas

Executive Summary



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DIRECTORATE: NATIONAL WATER RESOURCE PLANNING

WATER RECONCILIATION STRATEGY FOR THE KWAZULU NATAL COASTAL METROPOLITAN AREAS

Executive Summary

Final Version: November 2009

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1 PURPOSE OF THE DOCUMENT

The purpose of the Executive Summary is to provide an abridged description of the Water Supply Reconciliation Strategy that was developed during the Water Reconciliation Strategy Study for the KwaZulu Natal Coastal Metropolitan Areas. An overview of the strategy is presented along with the recommendations that are required to ensure sufficient water is made available for the growing water requirements in the area and to prevent an eminent water supply crisis. The reader is referred to the Second Stage Strategy Report for more detailed information.

2 INTRODUCTION

The KwaZulu-Natal Coastal Metropolitan Area consists of the area from Pietermaritzburg to Durban from west to east and from Kwadukuza (Stanger) in the north to Amanzimtoti in the south. It includes the eThekwini Metropolitan and the Msunduzi and Ilembe Municipalities, geographically depicted in **Figure 1** and schematically presented in **Figure 2**.

The main bulk water resources comprises the Mgeni, Mdloti, and Mvoti river systems with support by a transfer scheme sourcing water from the Mooi River. There are several large storage dams regulating the flow in the rivers: Midmar, Albert Falls, Nagle and Inanda on the Mgeni River and Hazelmere on the Mdloti River.

This metropolitan area is the third largest contributor to the national economy and has the second largest population concentration in the country. It is the economic hub of KwaZulu-Natal and is very important for the economic well being of the province. This area is experiencing rapid growth in water demand because of the influx of people from the rural areas, economic growth, and development initiatives like the Dube Trade Port.

The key objectives of the Study were to identify, evaluate and prioritise interventions to reconcile the water requirements with the available water resources up to the year 2030. This was achieved by means of a transparent and open process which was made possible through collaboration with stakeholders and institutions involved in the water supply cycle. The strategy received collective endorsement from the role players and several of the recommended actions have already commenced.

3 SCENARIO PLANNING

The strategy development methodology followed a scenario planning process where future water requirement scenarios provide the target water needs which have to be met by a combination of intervention measures. A diverse set of measures were identified covering both demand management initiatives as well as further infrastructural water resource augmentation projects.

The water requirement scenarios were based on the anticipated demographic dynamics driven by the socio-economic conditions and urban development planning in the area. The scenarios incorporate the provision of improved water supply services and also accommodating proposed housing development plans. The water requirement projections for the Ethekwini and Msunduzi Municipal areas were determined with the Water Requirement and Return Flow database model, which was developed for the Department as part of the Crocodile (West) River Return Flow

Assessment Study.

Various scenarios of future requirements were developed and the “high” scenario was used in the planning. The other scenarios were applied mainly to check the impact on the timing of the measures, as well as to ensure that the recommendations are stable and provide a flexible solution. Interaction took place with the Ethekwini Metropolitan Municipality during the development and finalisation of the scenarios.

4 WATER CONSERVATION AND WATER DEMAND MANAGEMENT

Water Conservation and Water Demand Management (WC/WDM) is a priority activity for Ethekwini Municipality and they are implementing a wide range of measures to reduce losses and improve the efficient use of water. The Reconciliation Study findings confirmed that there are potentially additional measures that could and should be implemented by Ethekwini to reduce the water requirements further.

The potential for further savings in water use through WC/WDM measures is high in the Msunduzi Municipal supply area and significant savings are possible by reducing water losses. Other municipalities like Ilembe and Ugu should also attend to WC/WDM as a top priority.

The Reconciliation Study Identified the need for the Department to engage with the Municipalities to overcome their constraints and possibly provide resources to implement WC/WDM measures in the supply area.

Water harvesting (rainwater collection with for instance roof tanks) is another method of extending the water resource investigated by the study. Although it does not have a major impact on reduction of municipal water demand when analyzed with conventional methods of yield determination, water harvesting has considerable benefits. It allows users to limit their dependence on formal water supply, it can assist with subsistence food gardening, in times of severe water restrictions it will provide important relief for basic needs and above all it will stimulate a culture of efficient water use.

Based on the analysis of potential savings, three WC/WDM scenarios were developed for application as intervention measures to reconcile the water demand with the available resources. **Table 1** provides the projected savings for the three scenarios, which are:

- **Scenario 1**: Five year water loss reduction programme**.**
    - Water losses can be controlled within the next 5 years (2005 to 2010) and maintained afterwards.
    - Limited water use efficiency is introduced.
- This scenario assumes that the WC/WDM measures can be implemented over a period of 5 years after which the capital expenditure will decrease and only maintenance activities will remain. This scenario focuses on the reduction in water losses (wastage) with limited water use efficiency intervention

- **Scenario 2**: Five year water loss reduction programme and efficiency improvements.

  - Water losses are controlled within a 5 year period (2005 to 2010) and maintained afterwards through continuous maintenance activities (Same as **Scenario 1**).

  - Water use efficiency is implemented by targeting the billed consumption. It was assumed that a 1% per annum efficiency can be gained from 2015 increasing to approximately 25% in the year 2025.

  This scenario is the most optimistic with regard to the potential water use savings that can be achieved and involves both savings from the Non-Revenue Water as well as savings from the Revenue Water, which are assumed to take place over 5 years and 10 years respectively.

  In **Scenario 2**, it was also assumed that some savings could be achieved through more efficient water practices inside the properties. This typically involves the use of water efficient appliances (washing machines, toilet cisterns etc) as well as low flow shower heads and water efficient gardens where irrigation is either not required or significantly reduced. .

- **Scenario 3**: Ten year water loss reduction programme.

  - Water losses can be controlled within the next 10 years (2005 to 2010) and maintained afterwards.

  - Limited water use efficiency is introduced.

  Scenario 3 is the same as **Scenario A.1** and only addresses the reduction in wastage. This scenario, however, assumes that certain actions can only be implemented over a period of 10 years.

Table 1: Savings for the three scenarios and the indicated planning years

Scenarios	Planning Years					
	2007	2011	2016	2021	2026	2031
1	5.4 (1.5%)	33.8 (8.6%)	42.7 (9.9%)	44.9 (9.5%)	47.2 (9.3%)	49.6 (9.1%)
2	5.4 (1.5%)	33.8 (8.6%)	61.4 (14.3%)	91.9 (19.4%)	113.0 (22.2%)	121.7 (22.4%)
3	5.4 (1.5%)	20.1 (5.1%)	39.2 (9.1%)	44.9 (9.5%)	47.2 (9.3%)	49.6 (9.1%)

Notes: (1) All volumetric values are given in million m^3/annum.

(2) Values in brackets give the percentage reduction in the total system urban demand from each intervention scenario.

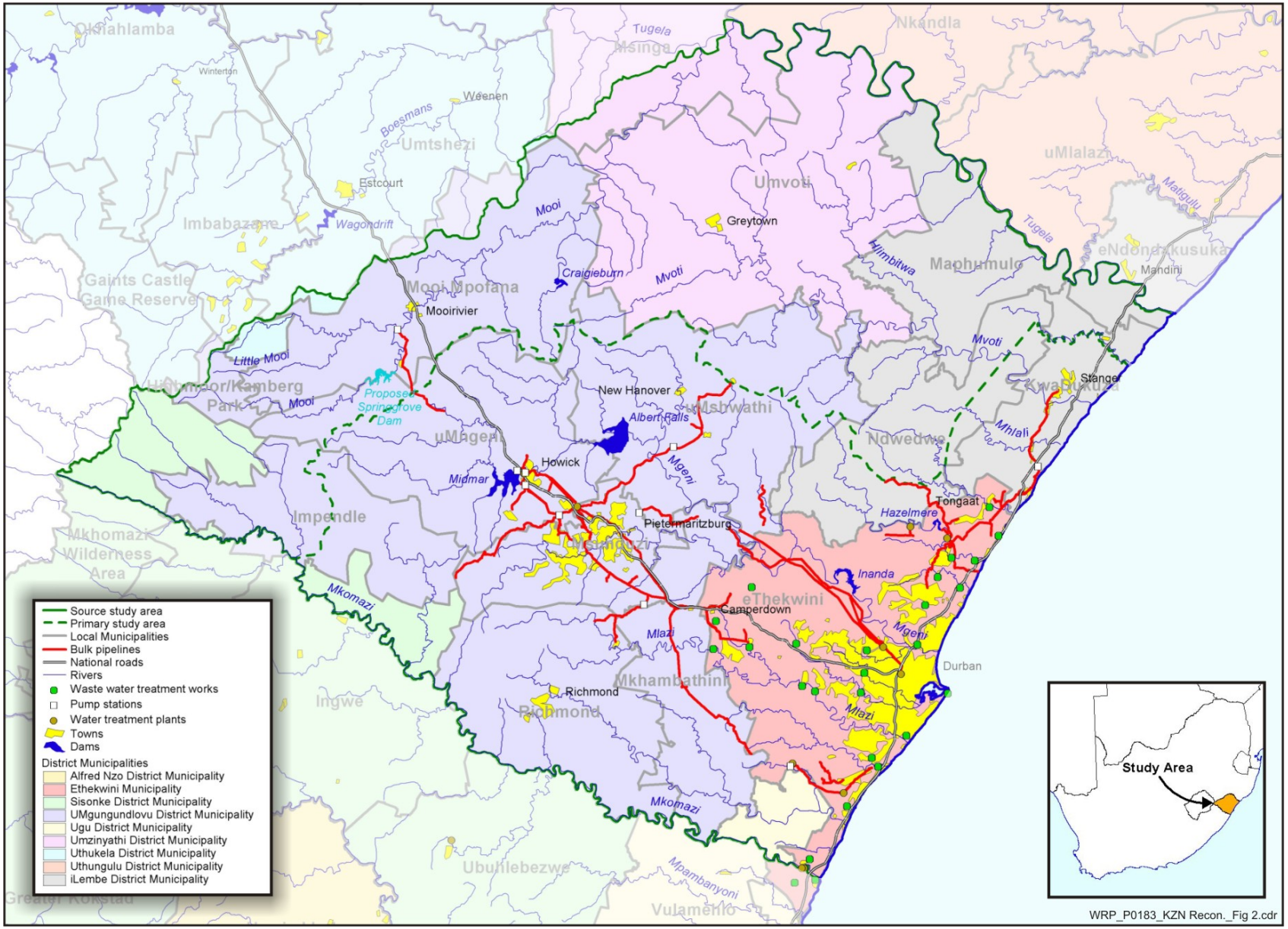

Figure 1: Map of the river systems and Metropolitan Areas

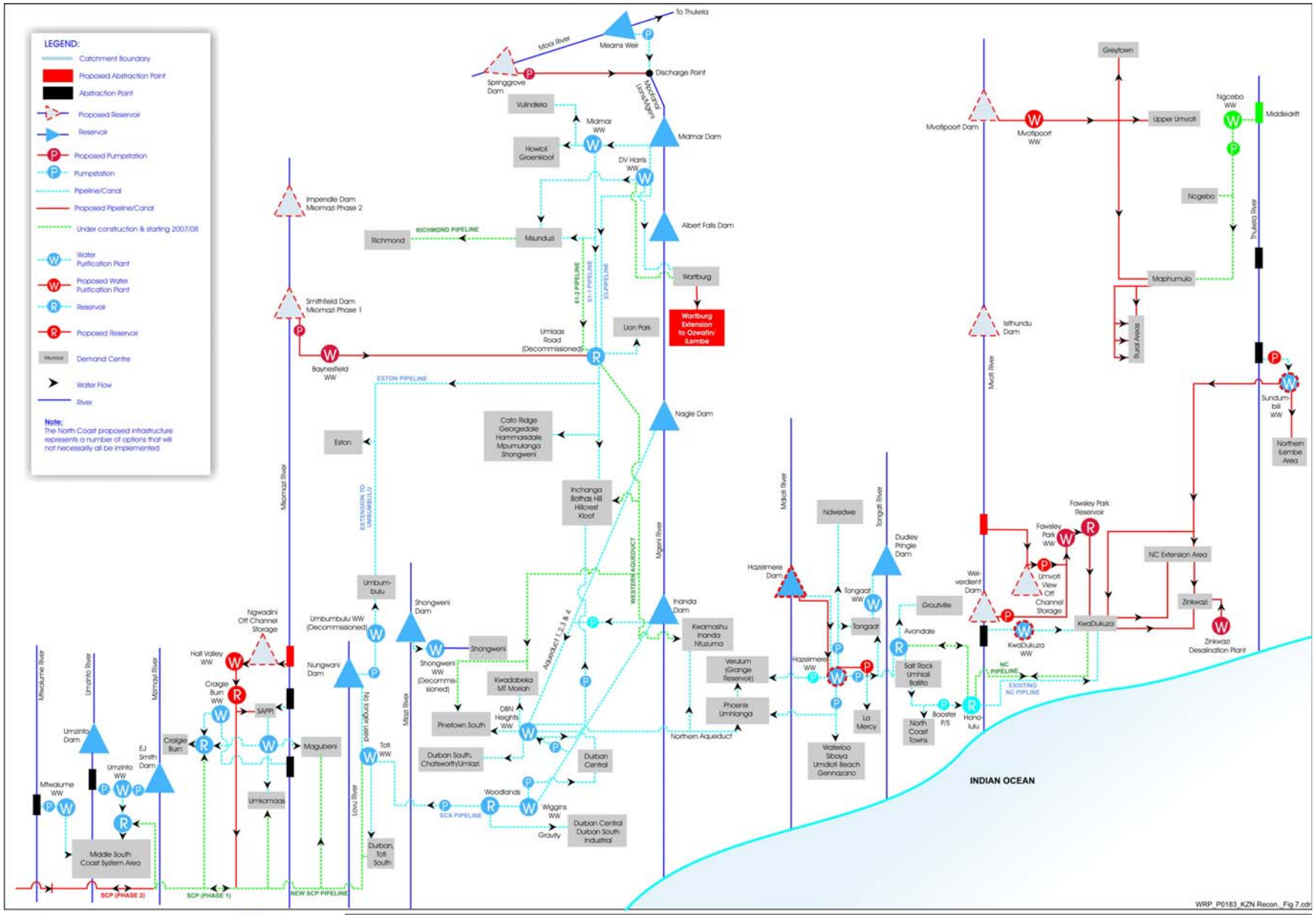

Figure 2: Schematic diagram of the water resources and supply area.

5 MEASURES TO INCREASE THE WATER RESOURCE

Due to the orientation and layout of the individual rivers flowing to the ocean and the stretched-out urban development along the coast, several detached development options (each supplying a portion of the area) were identified as potential solutions to augment the study area's water needs.

Numerous previous studies investigated these development options at varying levels of detail with the result that the implementation readiness of the developments varies. Given the current (year 2009) situation, where the water demands exceed the sustainable resource availability (See **Section 6** for details), some of the developments require immediate implementation and planning of others that need a long lead time to implement should commence immediately.

5.1 OPTIONS FOR IMMEDIATE AND SHORT-TERM IMPLEMENTATION

Mgeni River System supply area

The supply areas receiving water from the Mgeni River System consist of the Mgeni System Coastal Supply Area (Ethekwini Metropolitan Municipality) and the Mgeni System Inland Supply Area, comprising Mzunduzi as well as surrounding areas serviced by the water supply infrastructure managed by Umgeni Water.

The findings of the Reconciliation Strategy study as well as detail feasibility studies recommend the implementation of further phases of the Mooi-Mgeni Transfer Scheme. The Department has therefore recently directed the Trans-Caledon Tunnel Authority (TCTA) to implement Phase-2 of the Mooi-Mgeni Transfer Scheme (MMTS-2 - Spring Grove Dam and associated transfer infrastructure). Current indications (June 2009) are that the first delivery of water from MMTS-2 could only be in the year 2012. The MMTS-2 will add 60 million cubic meters of water annually to the system yield.

South Coast area

The water resources supplying the Ugu District Municipality, located in the southern part of the area, are not sufficient with the results that substantial drought curtailments had to be implemented in the recent past.

Umgeni Water in its role as regional Water Services Provider is implementing the South Coast Augmentation Pipeline (SCA) to augment the water supply of the South Coast System from the water resources of the Mgeni River System. This pipeline is currently under construction and will transfer purified water to the South Coast Supply Area.

North coast metropolitan area

The Mdloti River System with Hazelmere Dam, operated by Umgeni Water, is the primary water resource for the North Coast Metropolitan Area.

The projected water balance for the Mdloti River System indicates that augmentation of the water resources is necessary (See **Section 6** for details). The Reconciliation Strategy study as well as feasibility studies conducted by the Directorate: Option Analysis recommended that Hazelmere Dam should be raised to augment the water supply and reduce the risks of shortages.

Far north coast supply area

This covers the northern portion of the metropolitan area from Tongaat River to the Thukela River and forms part of the ILembe District Municipality. KwaDukuza is the main urban centre, which receives water from the Mvoti River as well as from Hazelmere Dam via a pipeline operated by Umgeni Water. The capacity of this pipeline is however insufficient to supply the water requirements and Umgeni Water is currently investigating the construction of a further pipeline to alleviate the short term water shortage.

5.2 OPTIONS FOR IMPLEMENTATION OVER THE MEDIUM AND LONG TERM

The water requirement of the metropolitan areas is expected to continue to increase over the next 20 years and additional augmentation will be required.

Mgeni River System supply area

The following options were proposed:

- Mkomazi-Mgeni Transfer Scheme consists of a proposed dam on the Mkomazi River near Smithfield, with a pump station and tunnel to transfer the water to the Mgeni System. The implementation timeframe for the scheme is about 10 years. The Reconciliation Strategy Study confirmed through findings from previous investigations that the development of the water resources of the Mkomazi River, for transfer to Ethekwini should be investigated. It is therefore recommended that a detailed feasibility study be commissioned as the next step in securing long term water supply.

- Reuse of return flows from selected Waste Water Treatment Works of Ethekwini The implementation timeframe is 5 years. (Further details are provided in **Section 5.3**).

- Desalination of sea water was also investigated. Initial results showed that desalination is more costly than the above options, however further investigations have indicated that the costs are significantly closer to the above options than initially calculated. It is proposed that the desalination of sea water should be investigated further in more detail.

North coast and far north coast supply area

Due to the proximity of the Mvoti and Thukela rivers to the northern parts of the metropolitan area, possible developments on these rivers were found to be viable options that could supply the medium and long term future water requirements. It is therefore recommended to commission a detailed feasibility study to determine which water resource development is most beneficial to

secure the future water requirements.

The following options are available:

- Transfers from two alternative options, either the Lower Thukela or the Mvoti Development scheme. The functions of these alternative schemes are to supply the far north coast supply area and then transfer the available remaining yield to the north coast metropolitan area. The Lower Thukela Scheme includes the utilisation of the presently unused yield in the Lower Thukela and consists of abstraction works, pump station and transfer infrastructure. The scheme has an implementation time of 5 years. The Mvoti Development Scheme consists of a dam on the Mvoti River near IsiThundu; abstraction works, a pump station, transfer infrastructure. The scheme has an implementation time frame of 10 years.

- Use of treated effluent. The option includes the reuse from selected Waste Water Treatment Works to augment the water resources of the Mdloti River System (Hazelmere Dam). The implementation timeframe is 5 years.

5.3 USE OF TREATED EFFLUENT

There are currently significant volumes of treated wastewater processed by municipalities that are either discharged directly or indirectly through the coastal rivers into the ocean. Ethekwini has already successfully implemented reuse for industrial purposes. However, reconnaissance investigations show that by applying sophisticated filtration and treatment processes (addition to current wastewater treatment plants) further reuse seems plausible and economically comparable to other alternatives. A major advantage of the reuse is that it could be implemented over a significantly shorter time period, compared to large surface water augmentation options such as the Mkomazi-Mgeni Transfer scheme.

The total return flow volumes generated from the eThekwini and Msunduzi municipal areas in 2006 are 57% of the total water use (195.0 million m^3/annum). Of the total return flows generated, certain waste water treatment works (WWTW) were identified to be suitable for domestic reuse purposes based on their location, return flow volumes and the industrial portion of the effluent volume. Effluent with an industrial component of 10% or less was regarded as suitable for domestic reuse purposes and effluent with an industrial component of more than 10% as only suitable for industrial purposes. The return flow and potential reuse projection volumes are shown in **Table 2**.

Table 2: Return flow volumes from Ethekwini and Msunduzi municipalities

Description	Return flow volumes for the indicated years (million m^3/annum)					
	2006	2011	2016	2021	2026	2031
Total Effluent	195.0	206.4	219.0	234.5	246.8	256.6
Unsuitable Due to Location and Size	40.2	43.0	46.0	49.5	52.9	55.7
Total Volume Remaining	154.8	163.4	173.0	185.1	193.9	200.8
Suitable for Industrial Reuse Only	89.4	92.5	95.7	100.3	102.5	104.4
Remaining Suitable for Urban Reuse	65.4	70.9	77.3	84.7	91.3	96.4

5.4 DESALINATION OF SEA WATER

A study to investigate the feasibility of desalination of sea water as an option to provide additional domestic water is being undertaken by Umgeni Water. Preliminary indications suggest that desalination of sea water is still more expensive than other alternative options, although it is recognised that at some point in the not too distant future desalination of sea water may become economical.

6 RECONCILIATION SCENARIOS

Reconciliation Scenarios were defined to determine how a sequence of interventions can be scheduled (phased) to satisfy the water requirements of the supply area up to the year 2030. Different scenarios, each consisting of alternative groupings of measures, were formulated to investigate the constraints and opportunities of a range of possible solutions.

The water supply situation (current and future) and the ability to reconcile the water availability with the water requirements are best reflected graphically through the resource yield vs. water requirement projections. Given the layout of the water resources supplying the KZN Metropolitan Area reconciliation balance graphs had to be compiled for three water resource systems, namely; the Mgeni River System, the Mdloti River System (Hazelmere Dam) and the Mvoti River System.

Several reconciliation scenarios were evaluated for the three water resource systems during the course of the study, which lead to the identification of specific actions that are required for sustainable water supply in these areas (see **Section 11** for the recommendations and actions).

*Reconciliation scenario for the Mgeni River System (See **Figure 3**):*

- Implement further WC/WDM loss management over a five year period (see description of the WC/WDM **Scenario 1** in **Section 4).**
- Commission the Mooi-Mgeni Transfer Scheme (Spring Grove Dam and conveyance infrastructure) at the earliest possible date, which is 2013.

- Commission the Mkomazi River development (Smithfield Dam and conveyance infrastructure) to deliver water by the year 2020.

- The shortfall prior to the year 2020 is supplied from reuse of treated effluent.

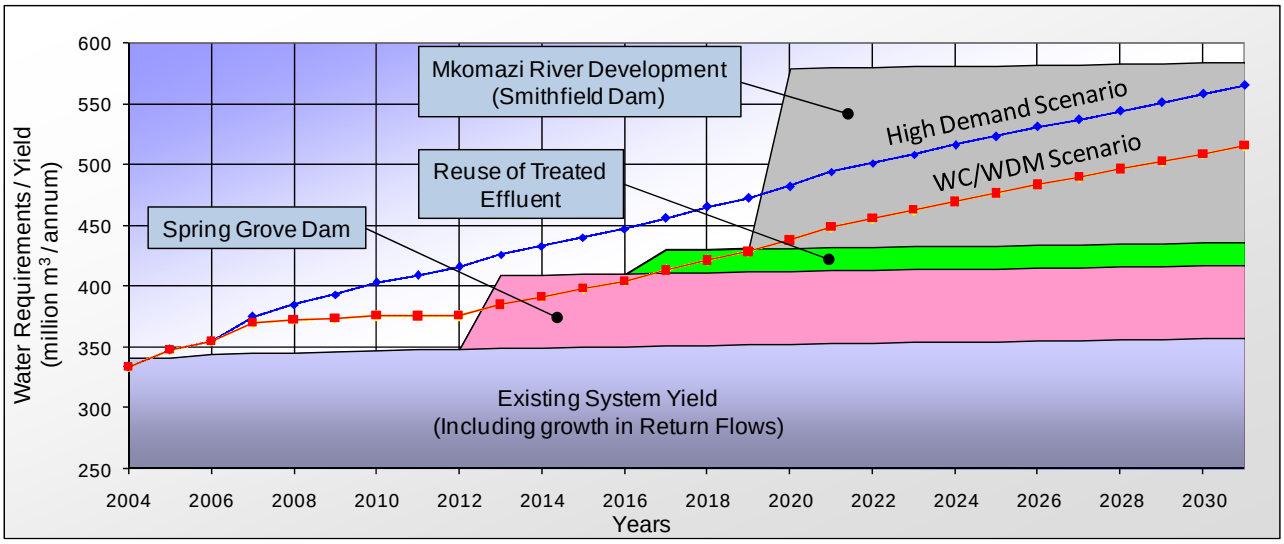

Figure 3: Mgeni River System Water Balance and Reconciliation Scenario

*Observations from **Figure 3** point to the following findings:*

- The water requirements exceed the system yield until Spring Grove Dam delivers water in 2013. This is even with Water Conservation and Water Demand Management (WC/WDM) being implemented (the red line represents the scenario with WC/WDM **Scenario 1**).

- WC/WDM is the *only* measure that can reduce the shortages over the short term and it is therefore essential to intensify loss reduction measures and water use efficiency programmes.

- Reuse of treated effluent is the *only* measure that is available to reconcile the water requirements in the years immediately prior to the implementation of Smithfield Dam. The reuse volume applied in this scenario is 24 million m^3/annum.

- Should it be possible to realise the full potential for reuse, **Table 2** shows that by the year 2031 about 200 million m^3/annum of water could be available for reuse, in which case the implementation of Smithfield Dam could be postponed beyond the year 2030 even if the high water requirement scenario (indicated by the blue line) takes place (see **Figure 4**).

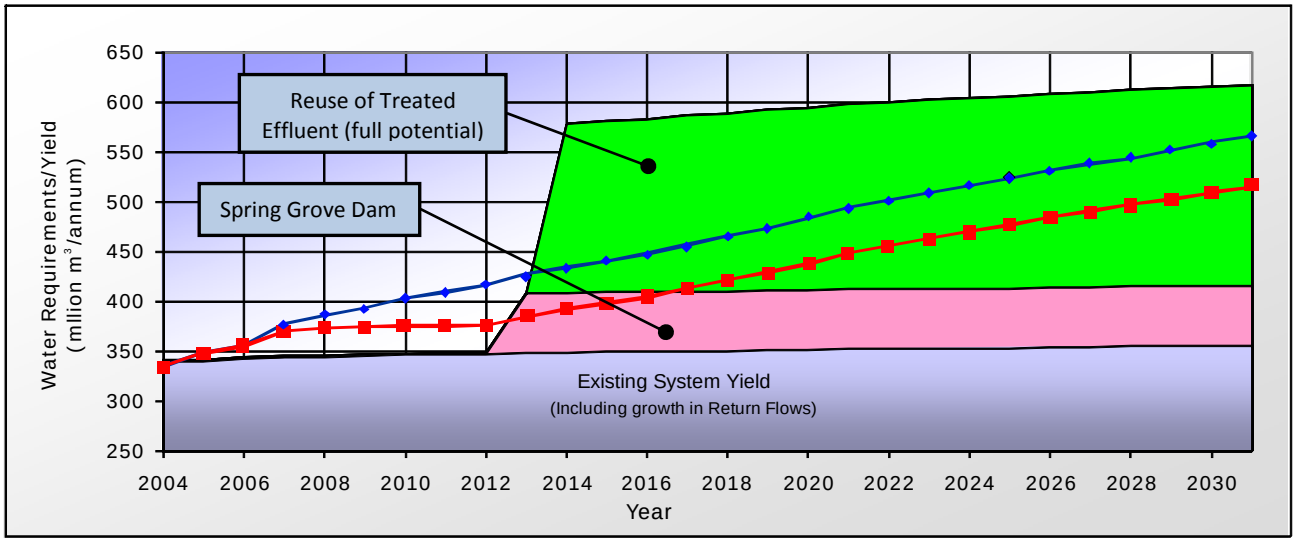

Figure 4: Mgeni River System Water Balance and Reconciliation Scenario (full potential reuse)

*Reconciliation scenario for the Mdloti River System (See **Figure 5**):*

- Enforce WC/WDM efficiency measures to reduce the customer demand in the Siza Water supply area (iLembe DM). The WC/WDM assessment showed that there is limited scope for reducing real losses.
- Hazelmere Dam is raised to increase the yield of the Mdloti River System by the year 2010.
- Reuse of treated effluent is implemented and commences delivery by 2014.
- The Mvoti River water resource development is implemented in two phases. Phase 1 consists of IsiThundu Dam with a storage capacity of 51 million m^3. The earliest possible date for water delivery from this option is in 2019. The second phase involves raising IsiThundu Dam (total capacity of 102 million m^3) scheduled to be effective by the year 2028.
- Water from the Mvoti River Development will be transferred to the Mdloti River System via the bi-directional North Coast Pipeline.
- The yield available from the Mvoti River development decreases over time as a result of the water balance of the Mvoti River System – see **Figure 6**.
- The Ecological Water Requirements for the Mdloti River is implemented through releases from Hazelmere Dam from 2019 onwards (this is shown by the reduction in system yield in the same year).
- The water requirement scenario assumed that all new urban developments will be using water efficiently and losses from the new supply infrastructure will be minimal.

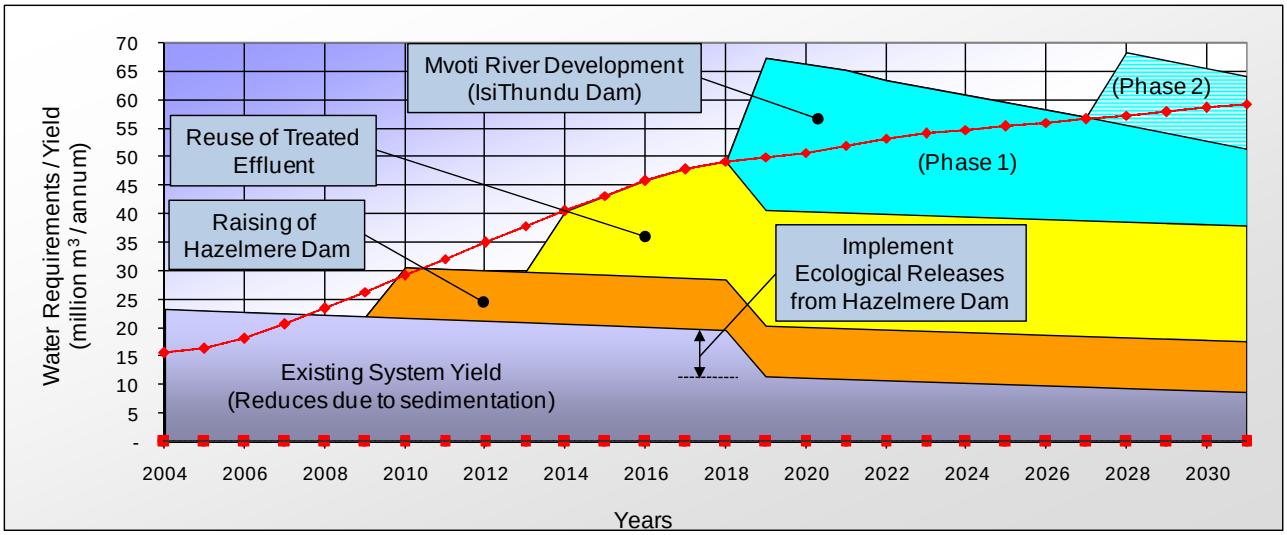

Figure 5: Mdloti River System Water Balance and Reconciliation

*Observations from **Figure 5** point to the following findings:*

- The water requirement exceeds the system yield in 2009, prior to the raising of Hazelmere Dam, thereafter a higher risk of shortages occur until the reuse option commences delivery in the year 2014.

- The system yield reduced over time due to the decreasing storage capacity of Hazelmere Dam as a result of siltation.

- The support from the Mvoti River System is sufficient to balance supply and demand until the year 2030 and beyond.

*Reconciliation scenario for the Mvoti River System (See **Figure 6**):*

- Resolve water supply issue in KwaDukuza and implement appropriate WC/WDM initiatives.

- The proposed Lower Thukela River Scheme does not require large regulating storage with the result that water delivery can commence by the year 2014, which is five year earlier compared to the Mvoti River water resource development.

- The proposed Lower Thukela River Scheme also supplements the water resources of villages north of the Thukela River. This is illustrated by the reduction in the Lower Thukela System yield indicated on **Figure 6**.

- The water requirement scenario was compiled from the "*Water Sanitation Master Plan for the iLembe District Municipality Area*" study.

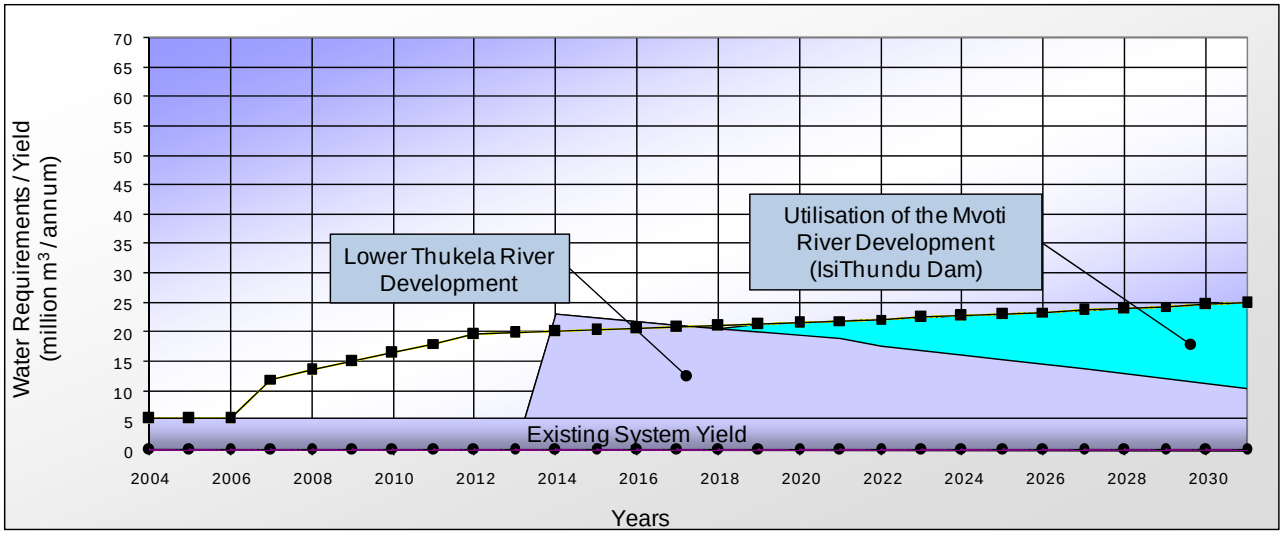

Figure 6: Mvoti River System Water Balance and Reconciliation Scenario

*Observations from **Figure 6** point to the following findings:*

- In an emergency drought situation, if it occurs during the initial period, the Mvoti System can be supplemented with transfers from the Mdloti River System through the proposed North Coast Pipeline, though for most of the corresponding period that system will also be in a shortage situation.

- Both the Lower Thukela and Mvoti River development options are required to reconcile the water requirements with the water resources over the long term.

(It should be noted that when the bi-directional pipeline is commissioned the Mvoti and Mdloti systems will effectively operate as an integrated system.)

7 PERSPECTIVE ON WATER QUALITY

A water quality review was carried out and indicated that, with respect to salinity and nutrients (Phosphate and Nitrate), the Mkomazi, Mooi, Mdloti and Mvoti River Systems are acceptable. An increasing trend in nutrients and ammonium concentration have however been observed in the Mooi River.

The water quality in the upper Mgeni River (Midmar Dam) is good, however the situation deteriorates further downstream. The water quality deteriorates significantly down stream of Nagle Dam, from where the Mgeni River is joined by the Msunduzi tributary.

The water quality in the middle and lower Msunduzi is very poor, with high faecal coliform content and nutrient over-enrichment. There is a significant risk of possible health effects if the water is used for drinking or contact recreation. The high nutrient concentrations in the lower Msunduzi

River contribute significantly to the eutrophication process in the lower Mgeni River. The Mgeni River downstream of the Mzunduzi River confluence are experiencing high conductivity, very high faecal contamination which indicates sewage pollution, very high nitrate concentrations, high ammonium, high phosphorus and high turbidity.

8 ECOLOGICAL WATER REQUIREMENTS (RESERVE)

In compliance the National Water Act, the strategy and the reconciliation scenarios were developed by incorporating available Ecological Water Requirement (EWR) information in the estimates of the utilisable yield of the water resource systems. The EWR determinations differ for each systems and the following summary are provided to present the approach that was adopted in the study:

- Comprehensive Reserve Determination studies were carried out for both the Thukela River and Mooi River systems. The utilisable yields for the Mooi-Mgeni Transfer Scheme Phase 2 and the proposed Lower Thukela River Scheme were determined with the EWR supplied as a priority water use.

- High confidence reserve determination information were available for the Mdloti River and estuary. The strategy incorporated releases from Hazelmere Dam as reflected in the reconciliation scenario presented in **Figure 2**. The D:RDM will carry out further technical refinements to make the river and estuary flow requirements compatible.

- Low confidence reserve determination information were available for the Mvoti River and Mkomazi River systems. This information was incorporated in the determination of the usable yield for the proposed Mvoti River Development (Isithundu Dam and conveyance infrastructure) as well as the option where water is transferred from Smithfield Dam on the Mkomazi River to augment the Mgeni River System. The D:RDM is initiating further studies to undertake high confidence reserve determinations for these river systems. This information is needed for the proposed feasibility studies (see **Section 11** for the recommendations).

- The Mgeni River requires special consideration due tot the highly modified state of that system. The water resources of the Mgeni River are extensively utilised for storage, abstraction and discharge of water without which the current socio-economic developments in the KZN Metropolitan Area would not be possible. It will therefore be necessary to follow a slightly different approach to the conventional reserve determination methods and it is proposed that a remedial flow management plan be developed with the objective to seek pragmatic solutions that will improve the current situation.

9 PERSPECTIVE ON WATER RESOURCE MANAGEMENT

The size of the water supply area and the layout of the river systems, which consists of various individual rivers draining to the ocean (as depicted in **Figures A-1** and **A-2**), makes it impractical to implement only a single solution. What is required and recommended is the implementation of

various interventions, which cover the geographical area and deal with both resource developments and demand management measures.

The reconciliation scenario presented in **Section 6** points to the following key water resource management interventions:

- Drought management.
- Water Conservation and Water Demand Management.
- Use of treated effluent.
- Water resource developments.

These are briefly described in the following sections:

Drought Management

Umgeni Water, in its capacity as DWA's agent for operating the systems, has undertaken operational planning activities for the Mgeni and Mdloti river systems in the past in accordance with the analytical techniques development and applied by DWA. The water balance diagrams (**Figures 1**, **2** and **3**) show that the water requirements of all three systems exceed the sustainable yield in the year 2009. Operation analysis carried out by Umgeni Water (May 2009) on the Mgeni River System confirms that there is an unacceptable high probability of drought restriction prior to the implementation of Spring Grove Dam. This situation requires focused drought management interventions to prevent situations of water supply failure and severe economic implications (not dissimilar to electricity load shedding).

Given the high risk of restrictions that is expected in the system over the medium term, it will be necessary to intensify the operational planning activities and closely coordinate management decisions among the institutions responsible for providing water to the end user.

It is therefore recommended that a System Operation Management Forum (SOMF) be established with representations from DWA, Umgeni Water, municipalities including Msunduzi, Ethekwini, ILembe and Ugu, as well as representatives of irrigated agriculture.

The main objectives of the SOMF will be to undertake the following:

- Make contributions to, and approve the operation plans.
- Provide data for monitoring purposes to track reality against the operation plan.
- Forum members will be required to inform their respective constituents of the operation plan, particularly when drought rationing (water restrictions) are implemented.
- Develop and facilitate a public information process to communicate relevant outcomes from the operation plan to the end users.

Water Conservation and Demand Management

According to the water balance of the Mgeni River System (see **Figure 1**) the *only* intervention that can reduce the shortage in supply over the short and medium term until the Mkomazi Scheme commences delivery is the implementation of Water Conservation and Water Demand Management measures.

Reuse of Treated Effluent

Although reuse of treated effluent for industrial purposed has successfully been implemented by Ethekwini, preliminary analysis indicate that further reuse options are economically comparable to the long term large water resource developments and warrant more detailed investigations.

Reuse of treated effluent at a large scale is the *only* measure that could reconcile the water balance of the Mgeni River System (for the period 2014 to 2019) for the high water requirement scenario (see blue line on **Figure 1**).

Water Resource Developments

The water supply situation presented in the previous sections require the immediate development of certain water resource projects and identified the need for further urgent investigations of options to determine their implementation readiness over the short and medium term planning horizon.

The proposed water resource management activities are summarised as follows:

Priority infrastructure projects

- Implement the Mooi-Mgeni Transfer Scheme to augment the Mgeni River System.
- Raise Hazelmere Dam to provide additional yield to the Mdloti River System.
- Implement the South Coast Pipeline to augment the water resource of the Ugu Municipality.

Priority feasibility and supporting studies

- Undertake a feasibility study to investigate reuse of treated effluent.
- Proceed with the feasibility study of the Mkomazi River Transfer Scheme as source for the Mgeni River System.
- Commission a feasibility study of the Thukela and Mvoti systems to increase supply to the Mvoti River and Mdloti River systems.
- Proceed with the planning and implementation of the proposed bi-directional North Coast Augmentation Pipeline to convey water between the Mdloti and Mvoti systems.

Climate Change

Climate change could have an influence on the reconciliation scenarios presented in the document. Umgeni Water is in the process of conducting a study on the impacts that climate change could have on the water resources. The results of the study will be incorporated into the strategy.

10 STAKEHOLDER ENGAGEMENT PROCESS DURING THE STUDY

From the onset of the study, partnerships were formed with key stakeholders representing the various sectors of society and in particular, close cooperation was achieved between eThekwini Metropolitan Municipality, Umgeni Water, DWA and other organisation through the functioning of the Study Technical Committee.

Broader stakeholder participation was achieved through two Public Meetings where representatives were selected to serve on the Project Steering Committee at the start of the study.

The First Stage Reconciliation Strategy was presented to the Project Steering Committee Meeting in August 2008 where the recommendations and respective responsibilities, as described in the following section, were formulated.

A further Project Steering Committee meeting is planned for October 2009 and a final Public Meeting thereafter.

The Project Steering Committee will be converted to a Strategy Steering Committee (SSC) to take the strategy further. The core functions of the SSC would include, among other things, the following:

- Be the first line of defence against any crisis;
- Implement the recommendations of the strategy and see that these are strictly adhered to;
- Be able to adjust the strategy if required;
- Report back to the DWA, Provinces and Local Authorities; and
- Provide feedback to stakeholders and the public.

11 RECOMMENDATIONS

The findings of the assessments presented above have resulted in the development of a number of specific water resource management strategies, required for the sustainable management of the water resources in the KZN study area. These are summarised as follows:

11.1 PRIORITY INFRASTRUCTURE IMPLEMENTATION PROJECTS

(a) Urgently Implement the Mooi-Mgeni Transfer Scheme (Spring Grove Dam and transfer system). The Department has recently directed the Trans-Caledon Tunnel Authority (TCTA) to implement Phase-2 of the Mooi-Mgeni Transfer Scheme (MMTS-2 - Spring Grove Dam and associated transfer infrastructure).

Action: National Water Resource Infrastructure Branch / TCTA
Timing: Immediate

(b) Implement the Raising of Hazelmere Dam without delay.

Action: National Water Resource Infrastructure Branch
Timing: Immediate

(c) Implement the North Coast Pipeline for short term support to KwaDukuza and long term support to the Mdloti System (bi-directional pipeline). Undertake planning and implement water treatment and related infrastructure to utilise the additional yield from the raised Hazelmere Dam.

Action: Umgeni Water.
Timing: To start immediately.

11.2 PRIORITY FEASIBILITY STUDIES

(a) Proceed with the Feasibility Study of the Mkomazi River Transfer Scheme.

Action: DWA Directorate: Option Analysis.
Timing: Begin study immediately.

(b) Commission a feasibility study of the Thukela and Mvoti systems for supply to the Northern Areas. Details regarding the structure of further planning activities will be decided among the relevant directorates of DWA. Umgeni Water may assist with transfer infrastructure.

Action: DWA Directorate: Option Analysis to coordinate.
Timing: Begin study immediately.

(c) Commission a feasibility study for water reuse options for supply to the Mgeni River System and the North Coast (consider current and future wastewater sources).

Action: eThekwini Metro with support from DWA and Umgeni Water
Timing: Study already underway.

(d) Commission a feasibility study for the desalination of sea water for supply to the Mgeni River System and the North Coast.

Action: DWA, eThekwini Metro and Umgeni Water
Timing: Begin study immediately.

11.3 WATER USE EFFICIENCY

(a) Ethekwini and the other municipalities implement further WC/WDM measures.

Action: Ethekwini, Ilembe, Ugu and Umgungundlovu municipalities as well as DWA Directorate Water Use Efficiency.
Timing: Immediately.

(b) Rain Water harvesting should be actively encouraged. Current projects by Ethekwini serve as examples and the lessons learned will inform further initiatives and programs. Further activities should be initiated and coordinated by the Directorate Water Use Efficiency of DWA.

Action: DWA Directorate Water Use Efficiency
Timing: Ongoing

11.4 INSTITUTIONAL ARRANGEMENTS

(a) Constitute the System Operation Management Forum and promote active involvement in the operational management of the Mgeni and Mdloti river systems among the relevant institutions. The representatives should include decision makers, managers responsible for system operation and representation from bulk water users such as industry and agriculture.

Action: DWA KZN Regional Office.
Timing: Immediately.

(b) Convert the Project Steering Committee into a Strategy Steering Committee as soon as the Reconciliation Strategy has been finalised.

Action: DWA Directorate: National Water Resource Planning and Study Steering Commitee
Timing: At the end of the study

(c) Establish a forum where information on projects and measures to save water are discussed and experiences are exchanged.

Action: Umgeni Water to coordinate.

11.5 COMMUNICATION

(a) Embark on a well structured media campaign to support the recommendation and actions.

Action: DWA KZN Regional Office and municipalities.
Timing: Immediate