



**water & forestry**

Department:  
Water Affairs and Forestry  
REPUBLIC OF SOUTH AFRICA

# ***Water Reconciliation Strategy Study for the Kwazulu-Natal Coastal Metropolitan Areas***

## ***1<sup>st</sup> Steering Committee Meeting***

***18 October 2007***

# *Welcome*

- **The KZN metropolitan area is an important economic cluster, requiring sustainable water resources**
- **Collaboration in the development of management strategies is essential**
- **Main clients of study products are represented**
- **We therefore welcome you to the first Study Steering Committee Meeting and would appreciate your valued contributions today and during the strategy development process**

# ***Objectives of the Meeting***

- **Convene the Study Steering Committee**
- **To confirm the roles and functions of the Study Steering Committee**
- **Present the study procedure and status**
- **Receive comments on the components of the study including the Technical and Stakeholder Engagement process**
- **To strengthen the partnership between DWAF and key stakeholders**

# ***Introduction of the Team***

- **DWAF representatives**
- **Professional Service Providers**
  - **DMM Development Consultants**
  - **Golder Associates Africa**
  - **Kwezi V3**
  - **WRP Consulting Engineers**
  - **Zitholele Consulting**
  - **Sub-consultants/Specialists**

# ***Agenda***

- **Welcome and Introduction**
- **Attendance and Apologies**
- **Acceptance of Agenda**
- **Overview of KZN Reconciliation Strategy Study**
- **Functioning of the Study Steering Committee**
- **Development of the KZN Water Reconciliation Strategy**
- **Discussions and Comments**
- **Way Forward**
- **General**
- **Closure and Next Meeting**

# ***Overview of the Kwazulu-Natal Water Reconciliation Study***

# ***Presentation Layout***

- **Objectives of the study**
- **Study Area**
- **Study procedure**
- **Overview of the scope of work**
- **Study deliverables and programme**

# ***Objectives of the study***

- **Analysis of the water demand profile and future water requirements**
- **Identification of interventions that will reconcile the water requirements with the available water for the period up to 2030**
- **Integration of augmentation and bulk supply options to achieve optimised overall benefits**
- **The strategy should be flexible to accommodate future changes in actual water use**
- **Extensive stakeholder engagement to build partnerships and promote co-operation**

# ***Broad Study Approach***

- **Three phase approach is being followed:**
  - **Inception Phase: Collection and collation of information**
  - **Second Phase: Develop First Stage Reconciliation Strategy , firm medium term measures and broad long term interventions**
  - **Third Phase: Compile Second Stage Reconciliation Strategy , refined long term interventions**

# ***Co-ordination with current planning initiatives (1 of 2)***

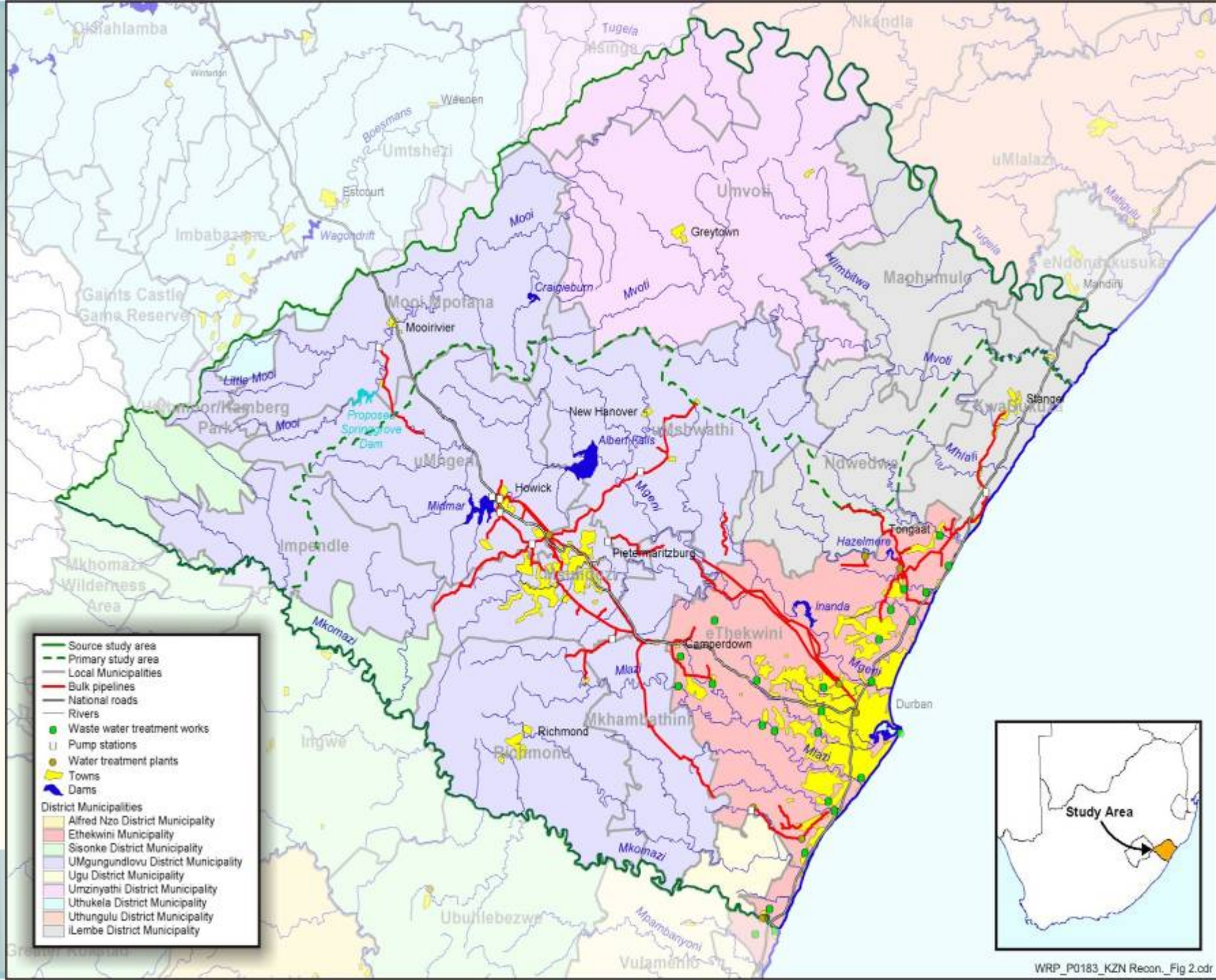
- **eThekweni water supply and wastewater planning initiatives**
- **WC/WDM projects of WSAs and WSPs**
- **Ilembe Master Plan**
- **Umgeni Water Bulk Supply Infrastructure Planning**
- **DWAF WC/WDM Study**
- **Mgeni Water desalination study**

# ***Co-ordination with current planning initiatives (2 of 2)***

- **DWAF augmentation infrastructure feasibility studies**
  - **Mkomazi River**
  - **Mvoti River**
- **DWAF Reserve Determination Studies**
- **Environmental Impact Assessments**
  - **Airport**
  - **Other developments**
- **Other studies and planning processes, WSDPs, IDPs ect.**

# ***Study Area***

- **KwaZulu-Natal North Coast Supply Area**
- **Mgeni System**
- **Links to South Coast**



# ***KwaZulu-Natal***

## ***North Coast Supply Area***

- **Water requirements**
  - **ILembe District Municipality**
  - **eThekweni Metro**
- **Supplies:**
  - **Umgeni Water's North Coast System (Hazelmere Dam)**
  - **Mvoti River**
  - **Tongati River**
  - **Towns supplied from Mhlali River**
  - **Groundwater**

# ***Mgeni System***

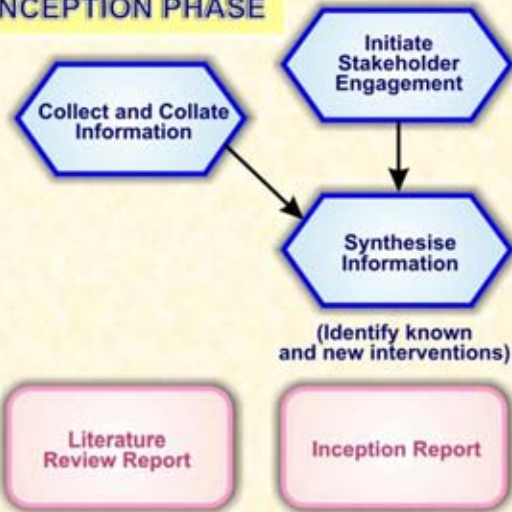
- **Water requirements**
  - **Msunduzi Local Municipality**
  - **eThekweni Metro**
  - **Portion of uMgungundlovu District Municipality**
  - **South coast augmentation**
- **Supplies:**
  - **Mgeni River System (Midmar, Albert Falls, Nagle and Inanda dams)**
  - **Mooi River Transfer Scheme Phase 1 (MMTS1)**
  - **Proposed MMTS2 – Spring Grove Dam**





***Study Procedure***

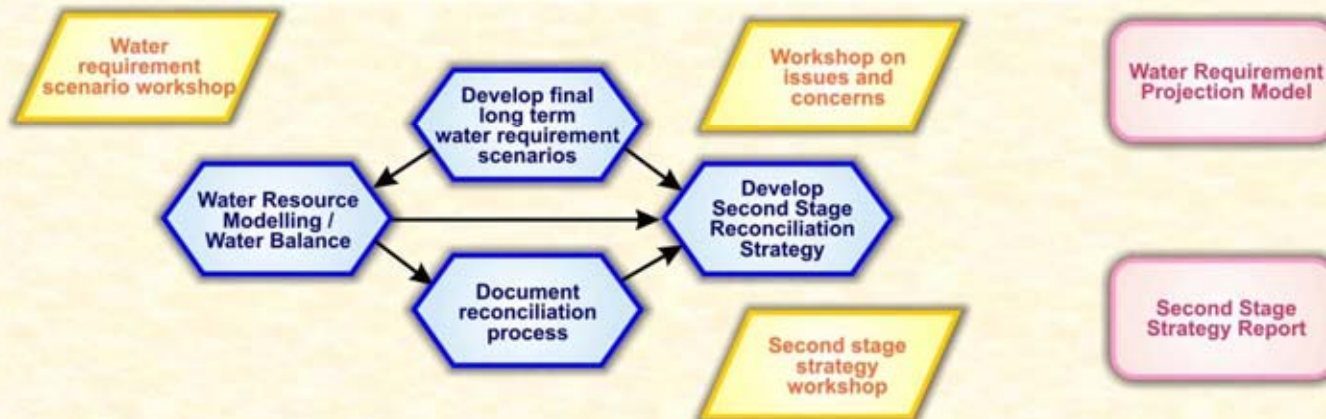
### INCEPTION PHASE



### PHASE 2: FIRST STAGE STRATEGY DEVELOPMENT



### PHASE 3: SECOND STAGE STRATEGY DEVELOPMENT



# ***Scope of work – tasks***

- **TASK 1: INCEPTION PHASE**
  - 1.1 Assemble and assimilate available information (Compile Literature Review Report)
  - 1.2 Prepare inception literature review reports
- **TASK 2: FIRST STAGE RECONCILIATION STRATEGY**
  - 1.2 Develop water requirement and return flow scenarios
  - 2.2 Assess intervention options
  - 2.3 Develop first stage reconciliation strategy
  - 2.4 Compile first stage reconciliation strategy report
- **TASK 3: SECOND STAGE RECONCILIATION STRATEGY**
  - 3.1 Refine water requirement and return flow scenarios
  - 3.2 Assess sequence of intervention options – develop second stage reconciliation strategy
  - 3.3 Document reconciliation process
  - 3.4 Consideration of other issues and concerns
  - 3.5 Compile second stage reconciliation strategy document
- **TASK 4: STAKEHOLDER ENGAGEMENT PROCESS (Public Participation)**
- **TASK 5: STUDY MANAGEMENT**

# ***5: STUDY MANAGEMENT***

- **Task leaders:**
  - **Infrastructure: N Serfontein**
  - **Water requirements: R Savage**
  - **WC/WDM: R McKenzie**
  - **Water resources: D Mnguni**
  - **Water quality and re-use: T Coleman**
  - **Environmental: R Heath**
  - **Stakeholder Engagement: R Seymore**
  - **Documentation and Strategies: P van Rooyen**

# ***Functioning of the Study Steering Committee***



# ***Confirmation of Membership***

- **Public / information meeting 20 June 07**
- **Sectors identified**
- **Nominations received at meeting**
- **DWAF reviewed and identified gaps (sector representation and nominations)**
- **Stakeholder engagement team communicated with organisations**
- **DWAF approved final list**

# Membership

National Government	DEAT DoA DWAf (Nat and Prov)
Provincial Government	Office of Premier Dept Agriculture & Environmental Affairs Dept Local Govt & Traditional Affairs Dept Economic Development
Local Government	eThekwini Msunduzi uMgungundlovu Ugu iLembe
Research / Universities	KZN University of Technology SA Sugarcane Research Institute
Organised Business and Industry	Dbn Chamber of Commerce & Industry PMB Chamber of Business

# *Membership (continue)*

Parastatals	Umgeni Water
NGOs and CBOs	Wildlife and Environmental Society of SA (WESSA) KwaNaLoga Siyanyuka Communications Sakhakuyekubekuhle Catchment Management Fora
Organised Commercial Forestry	Sappi – Saiccor
Conservancy	Blythedale Conservancy & KZN Wildlife Natal Conservancies Association
Organised Agriculture	South African Sugar Association (SASA)

# ***Roles and Responsibilities***

## **Proposed overall responsibility**

**To give guidance in steering the study by providing advisory support to the study team, identifying problems and / or problem areas in the study as well as sensitive technical and political issues**

# ***Proposed Terms of Reference***

- **Executive support, guidance and commitment to the direction and outcomes of the study**
- **Share / facilitate the sharing of information / data where possible**
- **Facilitate strategic linkages with other projects and stakeholders**
- **Study reports and provide comments**
- **Provide strategic advise**
- **Provide feedback to constituencies**
- **Act in the interest of the study and promote consensus**
- **Take ownership of final reports and recommendations**

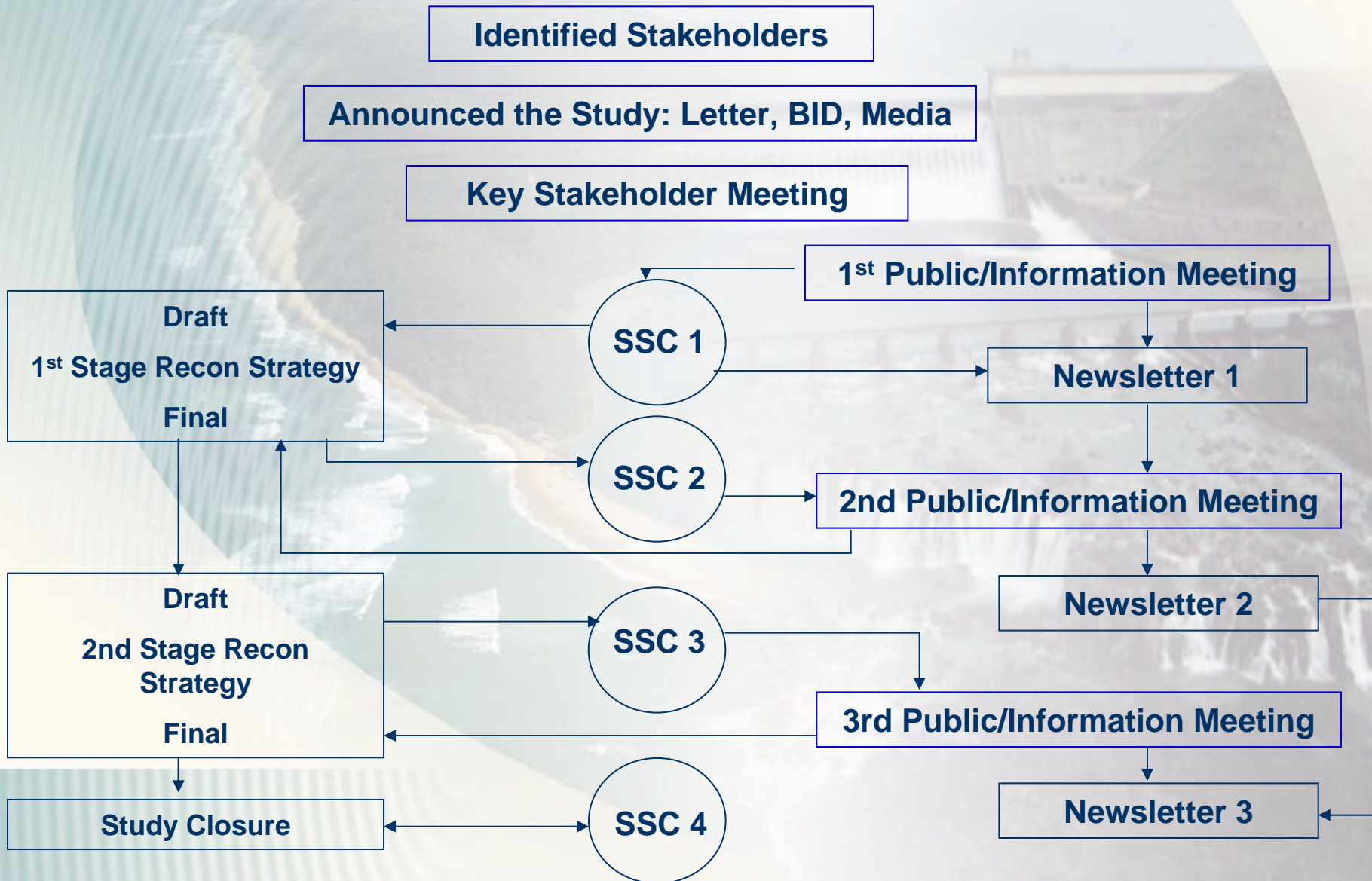
# ***Steering Committee Arrangements***

- **Voluntary institution**
- **Stakeholder Engagement Office to provide secretarial support:**
  - **Recording procedures**
  - **Formulate into document and distribution of it**
  - **Arrange meetings**

# ***Preliminary Meeting Dates and Process***

- **18 October 07**
  - **SSC agree on arrangements**
  - **Study team to give feedback on progress**
  - **Discussions**
- **28 February 08**
  - **Study team to present 1<sup>st</sup> stage strategy**
  - **Discussions**
- **12 June 08**
  - **Study team report progress on study**
  - **Discussions**
- **26 February 09**
  - **Study team present 2<sup>nd</sup> stage strategy**
  - **Discussions**

# Process of Stakeholder Engagement



# ***Strategy Implementation and Monitoring Process***

- **Strategy of interventions for period up to 2030 covering a wide geographical footprint.**
- **Interventions include demand side measures and supply options.**
- **The implementation of strategy components are the responsibility of various institutions.**
- **Therefore , there is a need for implementation and monitoring of the strategy beyond this study.**
- **Consideration should be given to establish an Strategy Implementation and Monitoring Committee.**

# ***Development of the KZN Reconciliation Strategy***



# ***Study Procedure and Status***

- **Three phase approach is being followed:**
  - **Water Requirements and Return Flows**
  - **Water conservation and Demand Management**
  - **Infrastructure Options**
  - **Water Resource Assessments**
  - **Water quality and Reuse**
  - **Strategy development (current views)**

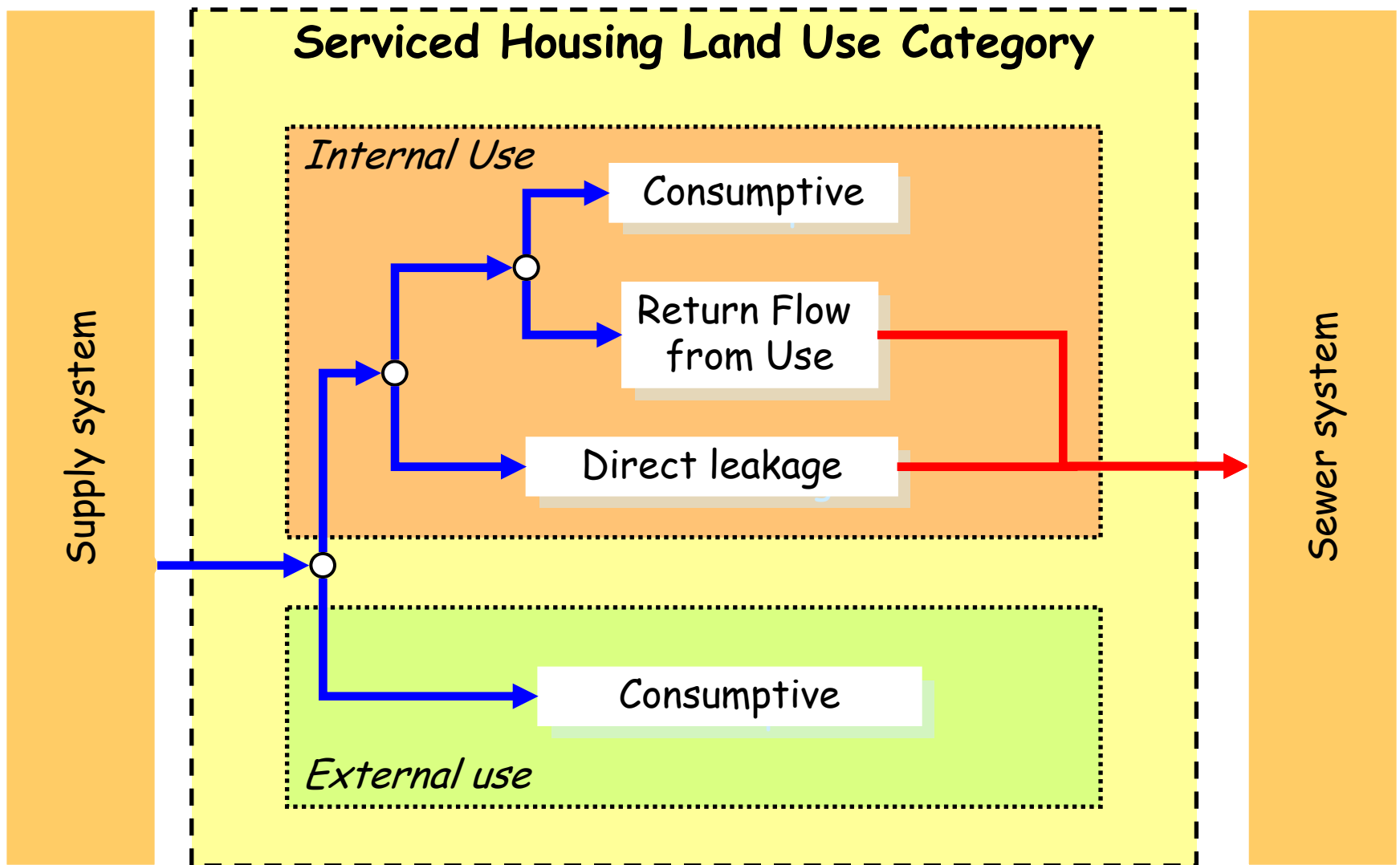
# ***Water Requirements and Return Flows***



# ***Scope of Work***

- **Develop water requirement and return flow scenarios based on**
  - **Demographic assessment - generation of population scenarios**
  - **Determine socio-economic influences on water use**
  - **Convene 1<sup>st</sup> water requirement scenario workshop**
  - **Apply urban water requirement and return flow model**
- **Review water requirement and return flow scenarios after completion of the first stage water reconciliation strategy**
  - **Convene 2<sup>nd</sup> scenario generation workshop**
  - **Apply urban model to revised long term scenarios**

# Conceptual Urban Return Flow Model



# *Status Quo*

- **Historic water requirements reviewed at**
  - **eThekweni Metro**
  - **Msunduzi Municipality**
  - **uMgungundlovu DM (parts of)**
  - **iLembe District Municipality (parts of)**
  - **Northern areas of Ugu DM (supplied from Wiggins WTW)**
  - **Agriculture**
  - **“Off-grid” rural areas**

# ***Status Quo, cont.***

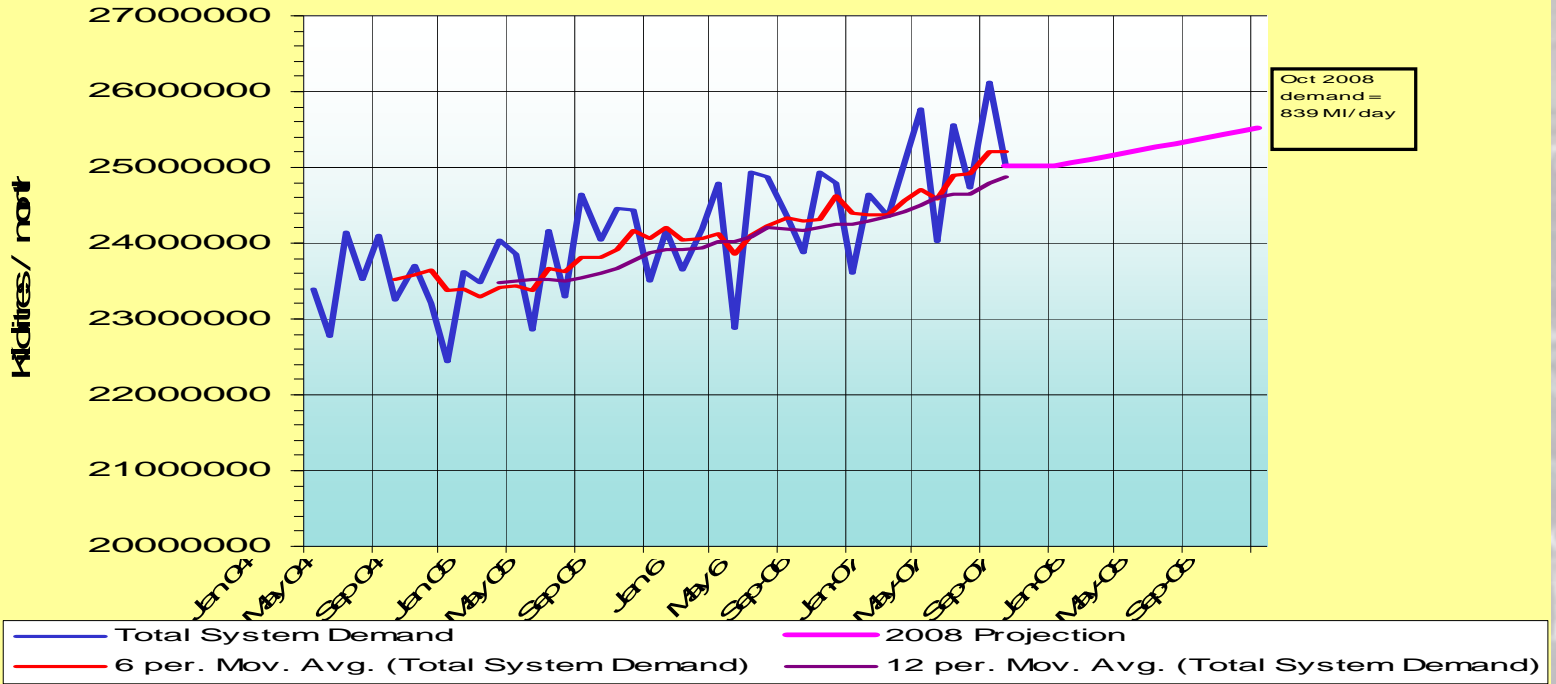
- **Specialist Studies undertaken:**
  - **Demographic review and projections**
  - **Review of correlation of water requirements with economic indicators**
- **1<sup>st</sup> Workshop : Water Requirement Scenarios (13 Sept 2007)**
  - **Presentations by specialists, Ethekewini Municipality, Umgeni Water, Eskom, Forestry, Irrigation, Environmental reps**

## ***Status Quo, cont.***

- **Ethekwini & Msunduzi Municipalities:**
  - **Analysis of consumer categories and water demands for defined Bulk Water Sales zones and Sewage Drainage Catchments**
  - **Calibration of sewage inflows with water demands for defined sewage drainage catchments**

# Ethekwini Municipality : Water Demands

## ETHEKWINI WATER DEMANDS



# *Key Findings*

- **Key variables for demographic projections**
  - **AIDS impact uncertainties**
  - **land-use & urbanisation**
  - **political-economic possibilities**
- **Low road : political-economic decline. 40% margin below median growth projections for 2030**
- **High road : HIV / ARV Solutions, sustained economic growth. 40% margin above median growth projections for 2030**

# ***Key Findings, cont.***

- **Overall population growth projections:**
  - **0.7% pa : best estimate**
  - **1% pa : High Road**
  - **0.4% pa : Low Road**
- **Key growth corridors**
  - **N2 - Durban-Stanger (best estimate growth rate, North : 1.2% pa)**
  - **N3 – Durban-Pietemaritzburg (best estimate growth rate, West : 0.9% pa)**
- **2030 Total Population:**
  - **Low Road : 5.6m**
  - **Best Estimate : 6.0m**
  - **High Road : 6.5m**

## ***Key Findings, cont.***

- **Domestic consumption comprises 60%-65% of supply to Ethekwini Municipality and Msunduzi Municipality**
- **Overall Water demand growth in Ethekwini has been 2.6% pa since 2005**
- **Biggest driver of water demand increases is coming from upgraded service levels and new low income housing, rather than the developed urban sector**

# Housing Categories

Serviced Housing Category	Description	Typical per capita usage <sup>(1)</sup> (l/c/d)
Category 1	Fully serviced houses on large erven (erven > 500 m <sup>2</sup> )	320
Category 2	Fully serviced flats, townhouses or cluster homes	320
Category 3	Fully serviced houses on small erven (erven < 500 m <sup>2</sup> )	160
Category 4	Small houses, RDP type houses and shanties with water connection, but no or minimal sewage service	90
Category 5	Informal houses serviced only by communal taps and no water borne sewage	10
Category 6	No service from any water distribution System	6
Category 7	Other/Miscellaneous (Includes hostels, military camps, etc.)	90



***General Discussion***  
***Thank you***



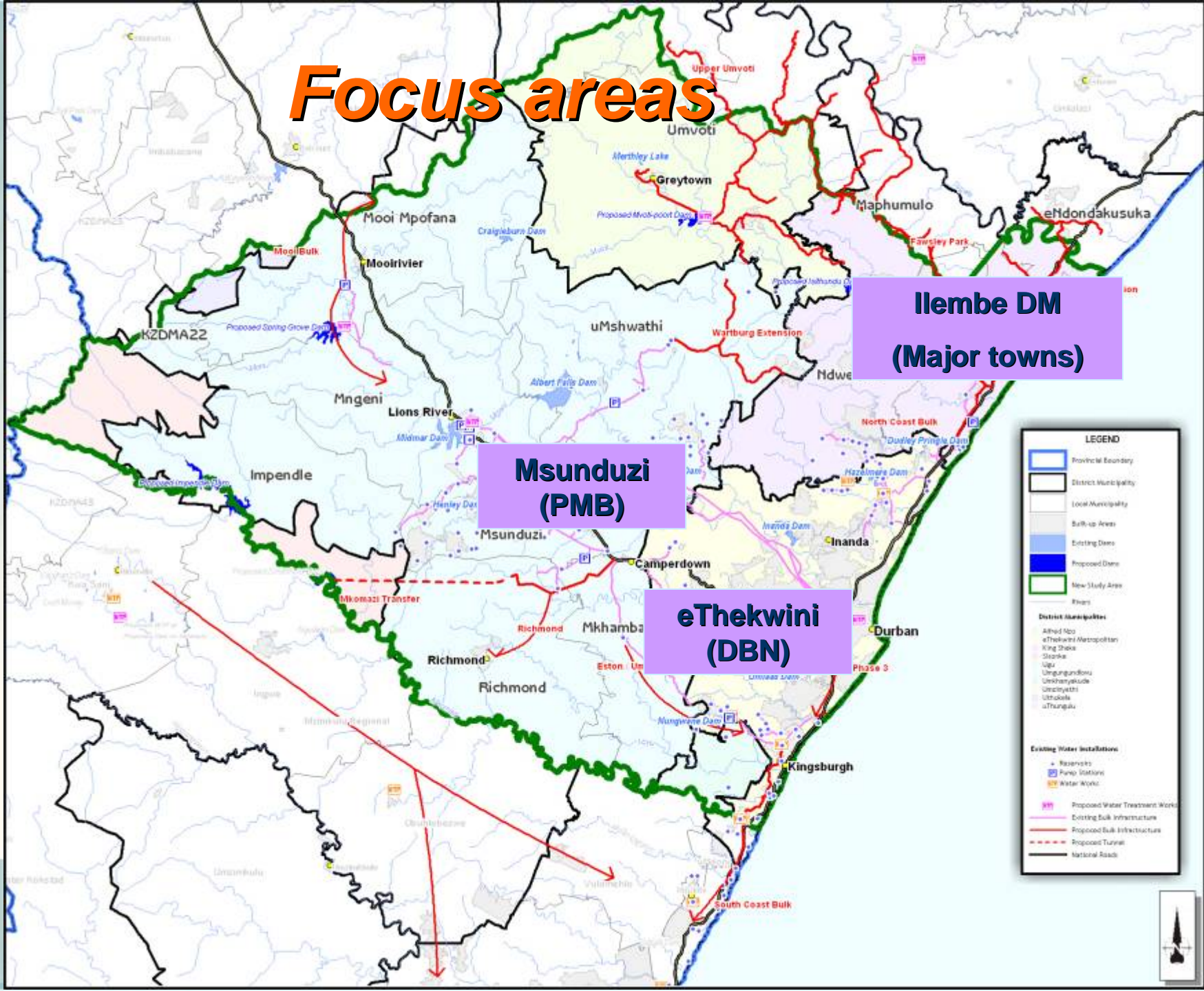
# ***Water Conservation and Demand Management***



# ***Objectives***

- **Assess effective and efficient use of water resources in urban, industrial, mining and power sectors (current demand)**
- **Assess the current and planned WC/WDM measures to develop reliable estimates of the savings that can be expected (potential savings)**
- **Asses the potential for reconciling current and future requirements through the selection and implementation of sector specific WC/WDM strategies (impact on future demand)**

# Focus areas



**Ilembe DM  
(Major towns)**

**Msunduzi  
(PMB)**

**eThekweni  
(DBN)**

**LEGEND**

- Provincial Boundary
- District Municipality
- Local Municipality
- Bulk-up Areas
- Existing Dams
- Proposed Dams
- New Study Area
- Rivers

**District Municipalities**

- Alfred Nzo
- eThekweni Metropolitan
- King Shaka
- Siyaniso
- Ugu
- Umgungahlanhlanh
- Umtshini
- Uthukela
- uThungulu

**Existing Water Installations**

- Reservoirs
- Pump Stations
- Water Works

**Proposed Water Treatment Works**

- Existing Bulk Infrastructure
- Proposed Bulk Infrastructure
- Proposed Tunnel
- National Roads



# ***Urban Methodology (1)***

- **Split focus areas into smaller management areas (former municipalities, current management areas, etc)**
- **Prepare water balance for each management area based on current IWA benchmarking indicators (Calculate losses)**
- **Assess potential savings through various interventions**

# ***Urban Methodology (2)***

- **Compare losses with potential savings**
- **Calculate URV's for various interventions**
- **Possible three scenarios**
  - **Reduce losses over 5 years and sustain**
  - **Reduce losses over 10 years and sustain**
  - **Reduce losses over 5 years and introduce efficient after 5 years**

# ***Standard IWA Water Balance***

<b>System Input Volume</b>	<b>Revenue Water</b>	<b>Billed and paid for consumption</b>
		<b>Free basic water Billed @ zero rate</b>
		<b>Unpaid for consumption</b>
	<b>Non Revenue Water</b>	<b>Apparent Losses</b>
		<b>UARL (Background losses)</b>
		<b>Potential saving on physical leakage</b>

# ***Industrial, Mining Power Methodology***

- **Benchmark the water use for key sectors in terms of international best practice**
- **Asses potential savings / losses**
- **Identify scope for possible WC/WDM measures within the industries, mines and power sectors**
- **Assessment potential for recycling and effluent reuse;**

# *Key deliverables*

- **Develop strategies that are realistic, achievable, sustainable and supported by WSA's**
- **Identify key constraints for implementation**
  - **Financial**
  - **Human resources**
  - **Political support**
- **Strategies address potential savings, cost implication, programme**

# *Progress*

- **Integrating with “Assessment of WC/WDM Strategies for the Mvoti to Mzimkulu Water Management Area : DWAF WUE**
- **Model has been developed**
- **Preliminary results available**

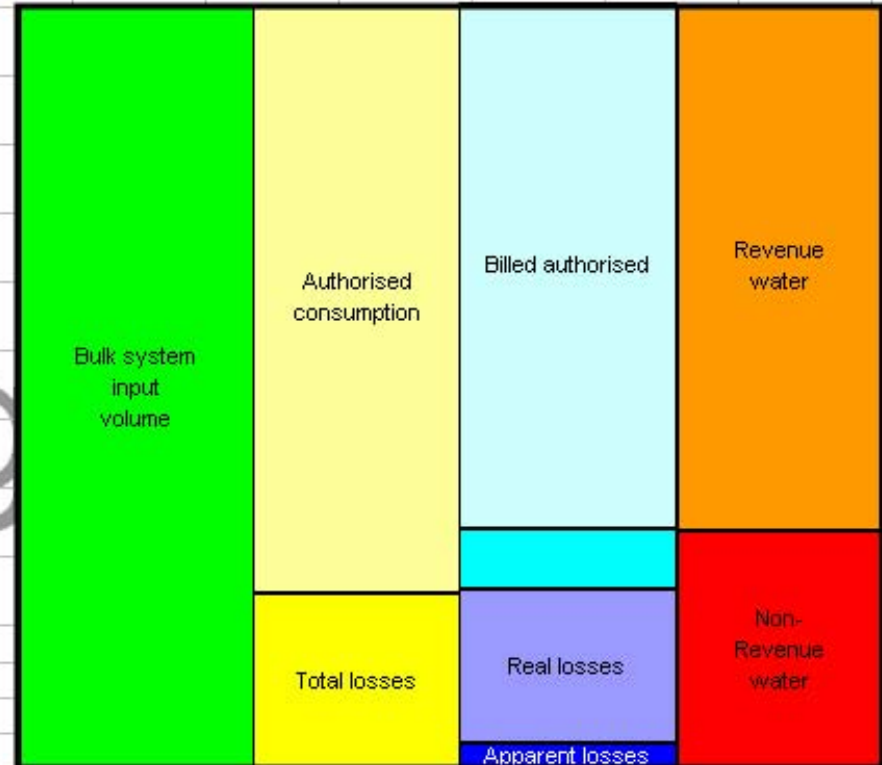
# eThekweni Water Balance

WATER BALANCE FOR:

**eTHEKWINI METROPOLITAN MUNICIPALITY**

2005 - 2006

Component	(million m <sup>3</sup> /annum)	%
1 Bulk system input volume	300	100%
2 Authorised consumption	231	77%
3 Billed authorised	207	69%
Unbilled authorised	24	8%
Total losses	69	23%
4 % Total losses apparent	13	4%
Real losses	60	20%
Apparent losses	9	3%
Revenue water	207	69%
Non-Revenue water	93	31%



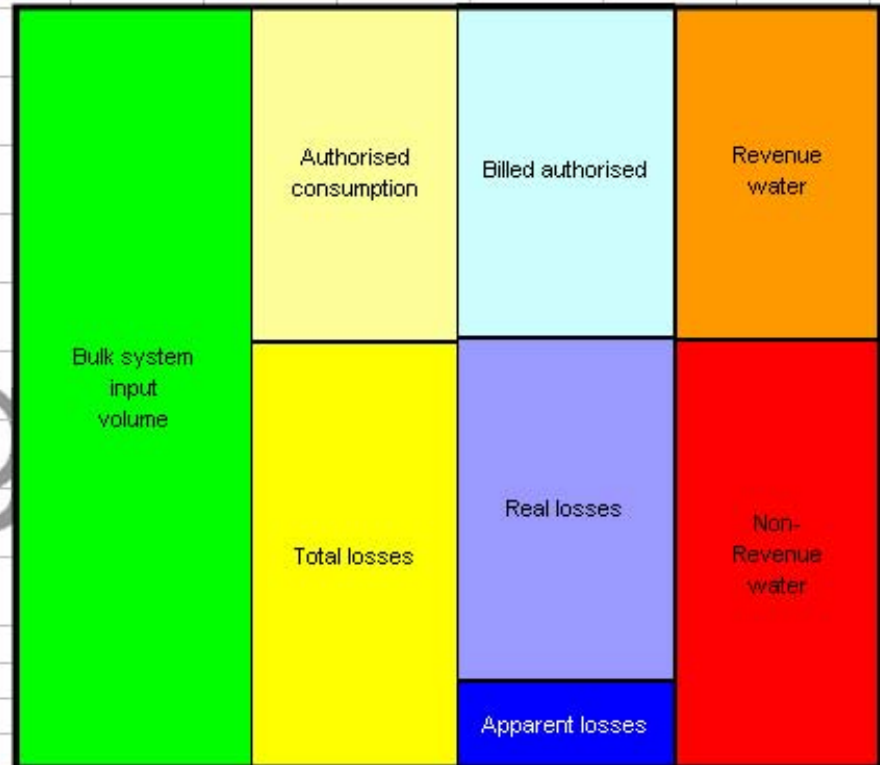
# Msunduzi Water Balance

WATER BALANCE FOR:

**MSUNDUZI MUNICIPALITY**

2005 - 2006

	Component	(million m <sup>3</sup> /annum)	%
1	Bulk system input volume	16.18	100%
2	Authorised consumption	7.13	44%
3	Billed authorised	7.13	44%
	Unbilled authorised	0	0%
	Total losses	9.05	56%
4	% Total losses apparent	20	124%
	Real losses	7	45%
	Apparent losses	2	11%
	Revenue water	7	44%
	Non-Revenue water	9	56%



# ***Key Interventions***

- **Metering and billing**
- **Pressure management**
- **Mains replacement**
- **Bulk metering**
- **Leak detection and repair**
- **Consumer awareness**

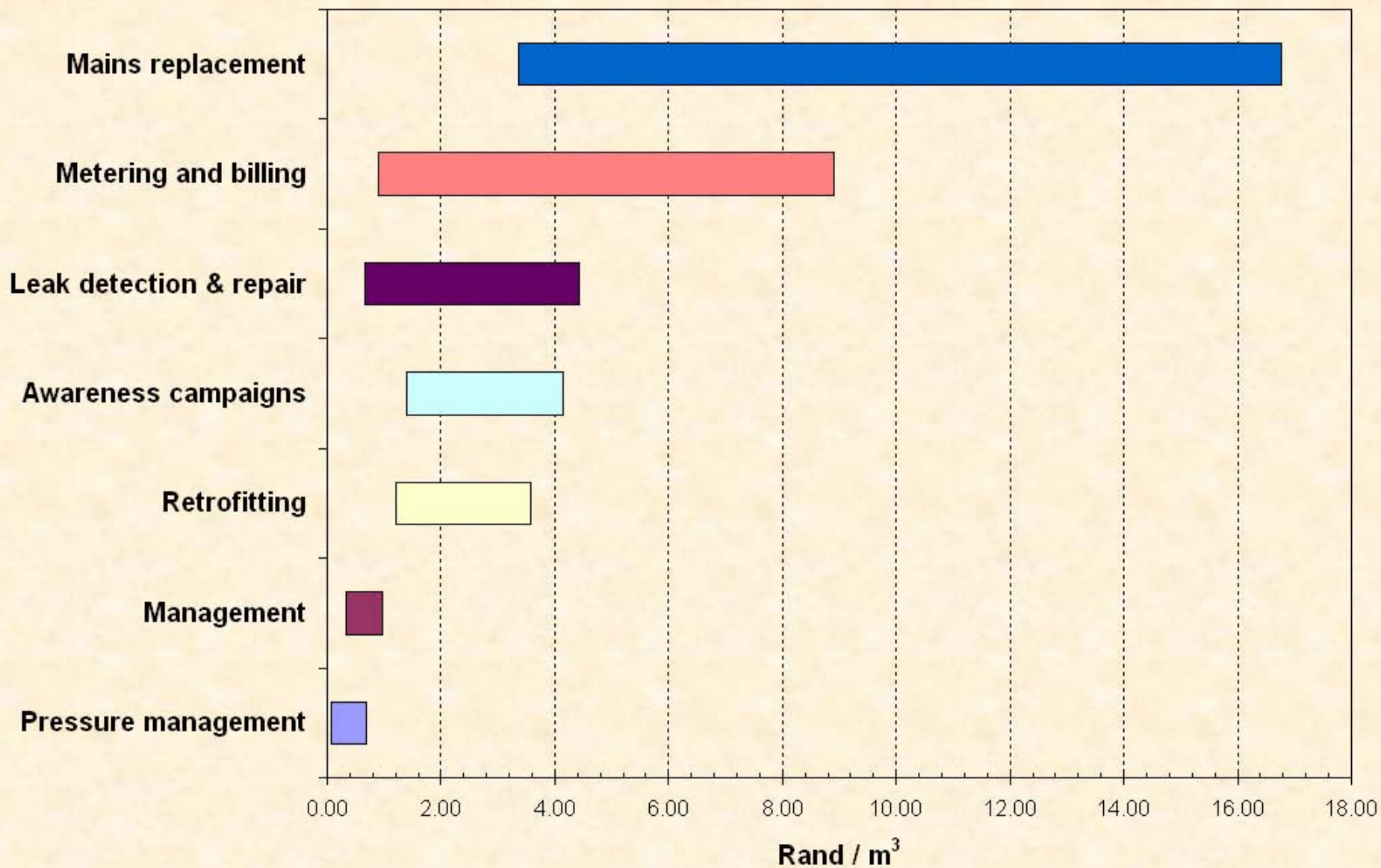
# ***Key Constraints***

- **Human resources**
- **Technical Skills**
- **Political support (all levels)**
- **Payment for services**
- **Consumer perceptions**

# *eThekweni WC/WDM Strategy*

- **Capital required = R 115 million**
- **Estimated saving = 23 mcm/a**
- **Reduced bulk purchases = R 48 million**
- **Increased revenue = R 67 million**
- **Non-revenue water = 22.5%**

# Unit Reference Values



# *Infrastructure Options*

# ***Contents***

- **Three supply areas**
  - **South coast**
  - **Mgeni system**
  - **Ilembe/North coast**
- **“Stand-alone” solution**
  - **Only one source is dedicated to a supply area**
- **“Integrated” solution**
  - **Supply from a source has impact on multiple supply areas**

# ***South Coast***

## **STATUS**

- **South Coast Pipeline Phase 1 (SCP1)**
  - Due for completion 2008
  - Supplied by Mgeni system
- **South Coast Pipeline Phase 2 (SCP2)**
  - To link with planned Ugu coastal system
- **Mgeni supplies SCP1 & is stressed**
- **SAPPI Ngwadini proposal**
  - Busy with EIA
  - No additional capacity, save for SAPPI

# ***South Coast***

## **“STAND-ALONE” SOLUTION**

- **All solutions appear to affect other areas**

## **“INTEGRATED” SOLUTION**

- **Source for SCP1 and 2 a problem**
  - **SCP1 has bi-directional flow**
- **Local developed sources under stress**

# ***South Coast***

## **“INTEGRATED” SOLUTION**

- **Lower Mkomazi River**
  - **Additional off-channel storage?**
  - **Effect on all south coast towns**
  - **Less load on Wiggins/Mgeni system**
- **Augmentation via Ugu system**
  - **From Mzimkulu River?**
  - **Impact south coast towns (outside study area)**
  - **Less load on Wiggins/Mgeni system**

# ***South Coast***

## **“INTEGRATED” SOLUTION**

- **Middle Mkomazi River**
  - **Possible use of Ph1 system for releases**
  - **Abstraction point in lower Mkomazi River**
  - **Design impacts on supply to Mgeni system**

# ***Mgeni System***

## **STATUS**

- **Spring Grove Dam complete 2012**
- **Mkomazi River development**
  - **Phase 1 (Smithfield Dam)**
    - **Feasibility studies to commence 2008**
- **Western aquaduct**
  - **eThekweni planning**
  - **Affects infrastructure upstream of Mkomaas Rd**
  - **Increases demand on Mgeni sources**

# ***Mgeni System***

## **STATUS**

- **Western aquaduct (ctd)**
  - **Increases demand on Mgeni sources**
- **Lessens load on Durban Heights WTW**
  - **And also on Northern aquaduct**

# ***Mgeni System***

## **“STAND-ALONE” SOLUTION**

- **All solutions appear to affect other areas**



# ***Mgeni System***

## **“INTEGRATED” SOLUTION**

- **Through various linkages**
  - **Sources in Mgeni system supply other supply areas (direct & indirect)**
- **Mkomazi River development**
  - **Position of Ph1 water works**
    - **Could effect supply to south coast & rural areas en route**

# ***Mgeni System***

## **“INTEGRATED” SOLUTION**

- **Use of recycled water**
- **Estuarine reserves**
  - **In combination could augment North Coast supply**
- **Use of Inanda Dam**
  - **Energy cost vs. other capital developments**

# ***Ilembe/North Coast***

## **STATUS**

- **Hazelmere Dam being raised**
  - **2008**
- **Ncebo scheme being designed**
  - **Thukela River as source**
  - **Will supply KwaDukuza within 5 years**
  - **Mvotipoort system required by 2020**
- **Ballito-KwaDukuza pipes being upgraded (2008)**
  - **Bi-directional flow**

# *Ilembe/North Coast*

## STATUS

- **Stanger WTW**
  - Due to be refurbished
  - UW studying sand-point system (+6 MI/d)

# *Ilembe/North Coast*

## **“STAND-ALONE” SOLUTION**

- **Bi-directional pipe (Ballito-KwaDukuza)**
  - **Makes systems integrated**

# ***Ilembe/North Coast***

## **“INTEGRATED” SOLUTION**

- **Mvotipoort now a given**
  - **To replace Thukela River over long term**
- **Will tidy Wilverdient & isiThundu Dam options**
- **Then: interim solutions**
  - **Mvoti View option (needs isiThundu)**
  - **Wilverdient weir (needs Wilverdient Dam)**

# ***Ilembe/North Coast***

## **“INTEGRATED” SOLUTION**

- **Mvoti View option**
  - **Possible supply from Mvotipoort Dam?**
- **Common to Mvoti View & Wilverdient**
  - **Water works**
  - **Fawlsey Park reservoir**

# ***Ilembe/North Coast***

## **“INTEGRATED” SOLUTION**

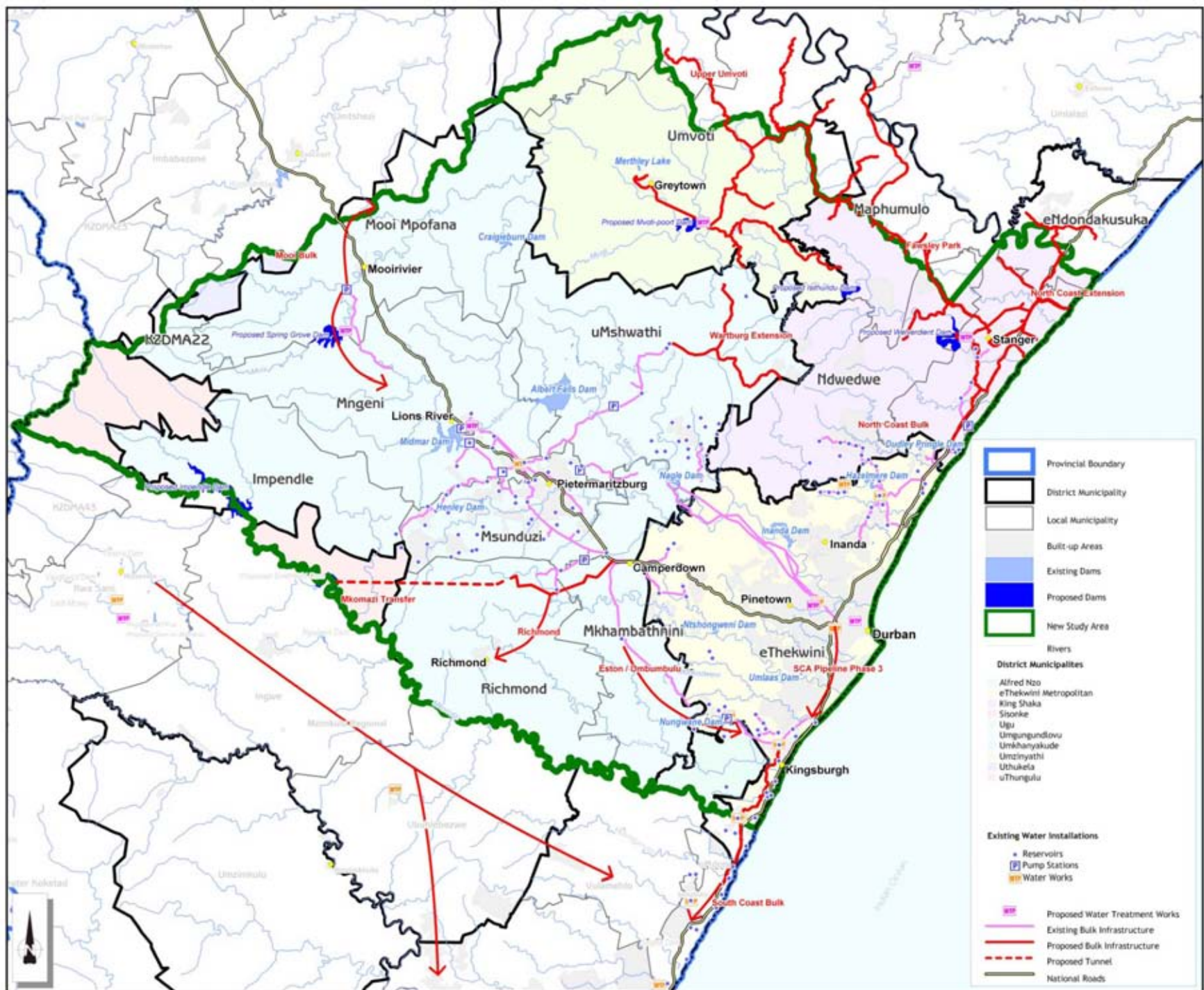
- **All developments on Mvoti**
  - **Releases stress on Hazelmere Dam**
  - **Possible supply from there to**
    - **eThekwini North**
    - **Dube Trade Port (20 MI/d)**
    - **Lessens stress on Mgeni**

# ***Water Resources Assessment***



# ***Surface Water Component***

- **Obtain most up to date network system**
  - **Mgeni, Mooi, Mvoti, Mdloti, Mkomazi**
- **Linking of existing system networks (cross correlation)**
- **Yield analysis of options (where applicable)**
- **Planning analysis of scenarios: Water Requirements and Interventions**
- **Evaluate operating rules**



- Provincial Boundary
- District Municipality
- Local Municipality
- Built-up Areas
- Existing Dams
- Proposed Dams
- New Study Area
- Rivers
- District Municipalities**
- Alfred Nzo
- eThekweni Metropolitan
- King Shaka
- Sisonke
- Ugu
- Umgungundlovu
- Umkhanyasude
- Umtshwathi
- Uthukela
- uThungulu
- Existing Water Installations**
- Reservoirs
- ⊞ Pump Stations
- ⊞ Water Works
- Proposed Water Treatment Works
- Existing Bulk Infrastructure
- Proposed Bulk Infrastructure
- - - Proposed Tunnel
- National Roads



# ***Ground Water Component***

- **Evaluate existing schemes**
- **Potential for new developments**
- **Quality assessment**

# ***Water Quality and Re-use Task***



# ***Water Quality Assessment***

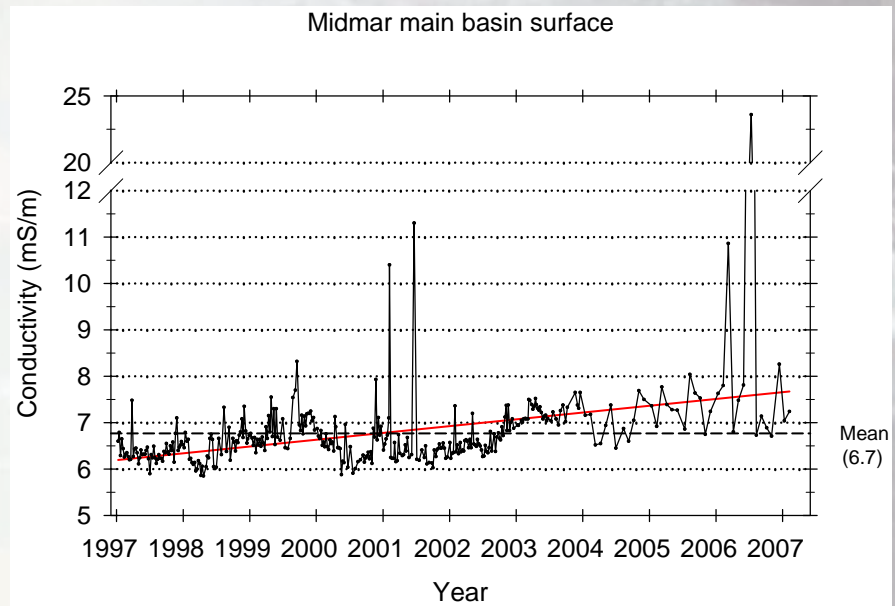
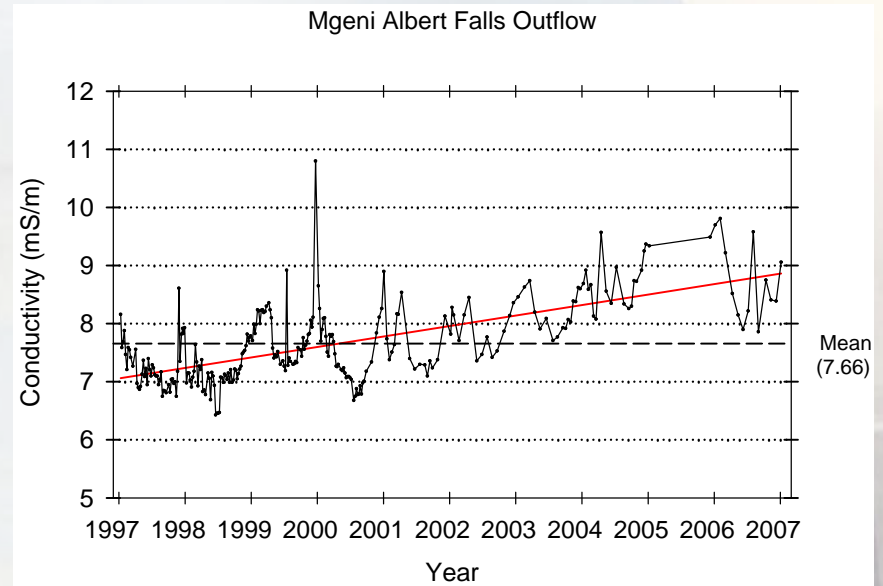
- **Objective**
  - **Understand current water quality situation in study area to provide qualitative input into water quality changes that can be expected from reconciliation strategies**

# ***Water Quality Assessment - Procedure***

- **Use existing studies as starting point – 1994 study for the Department and Umgeni Water**
- **Collect water quality data at key points and analyse data – Focus on salinity and nutrients**
- **Discuss water quality issues with Department, Water Boards and municipalities**
- **Review reports and available information**

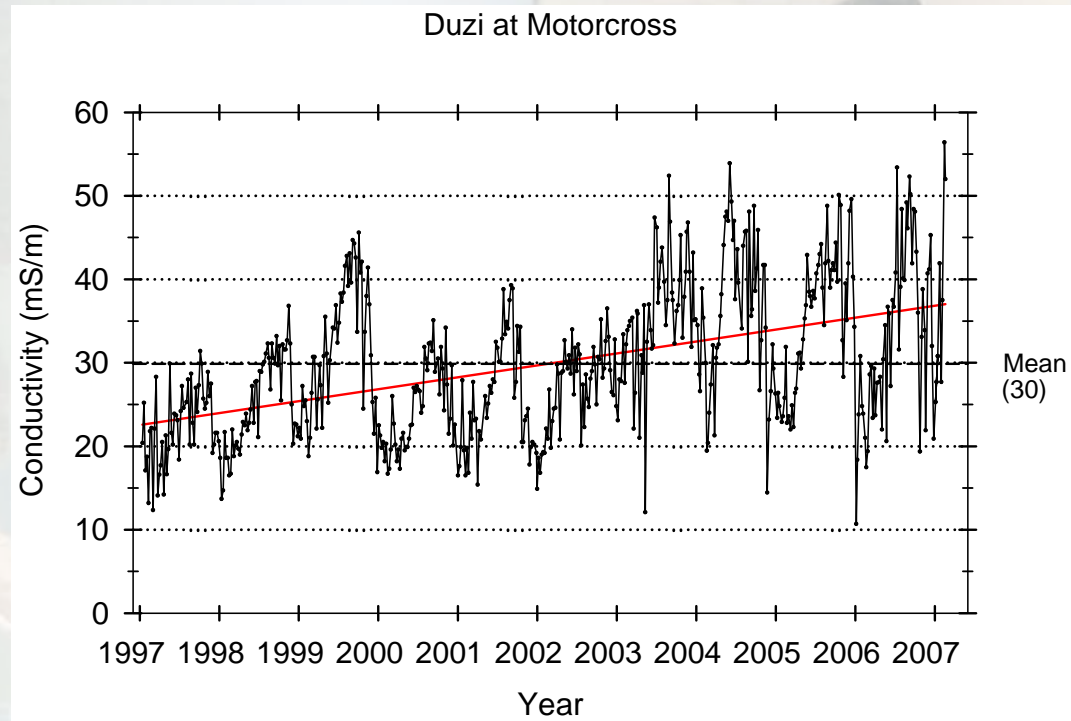
# Water Quality Assessment – Status

- Good quality in terms of salinity
- Upward trend in Conductivity observed in major dams



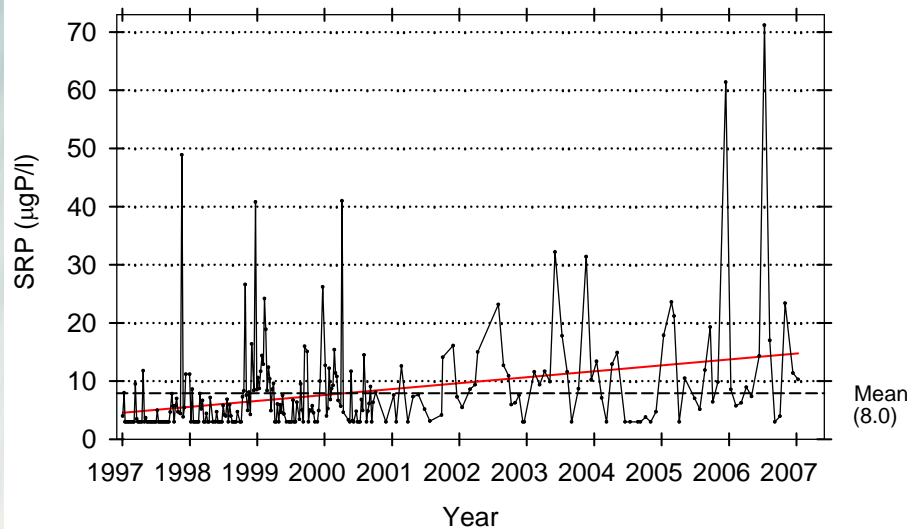
# Water Quality Assessment – Status

- Msunduze has poorest quality
- Salinity order of magnitude higher than headwaters

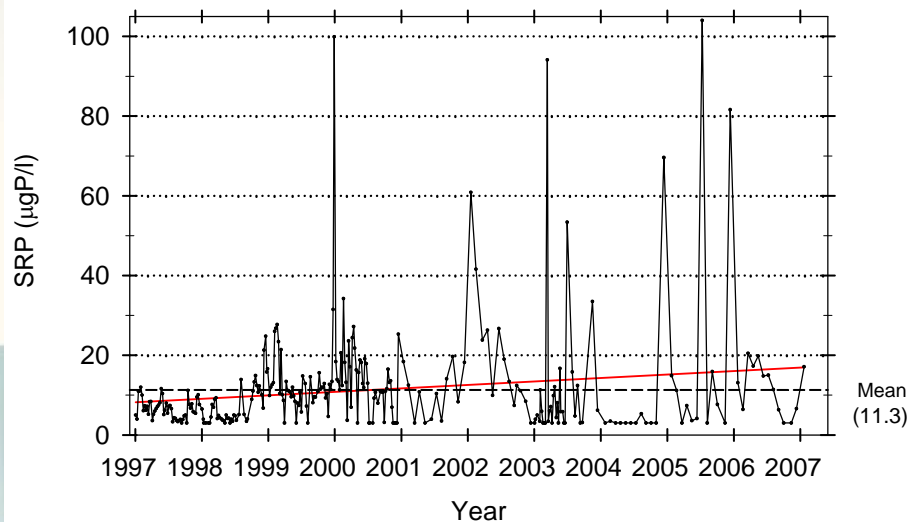


# Water Quality Assessment – Status

Mgeni d/s of Nagle Dam



Hazelmere main surface basin



- Trophic status of impoundments range from Oligo to mesotrophic
- However eutrophication is becoming an issue in some of the river systems
- Increasing trends in SRP

# ***Water Quality Assessment – Status***



- **Algal blooms and aquatic plants are being observed in the river system and impoundments**

**Hyacinth upstream  
end of Inanda Dam**

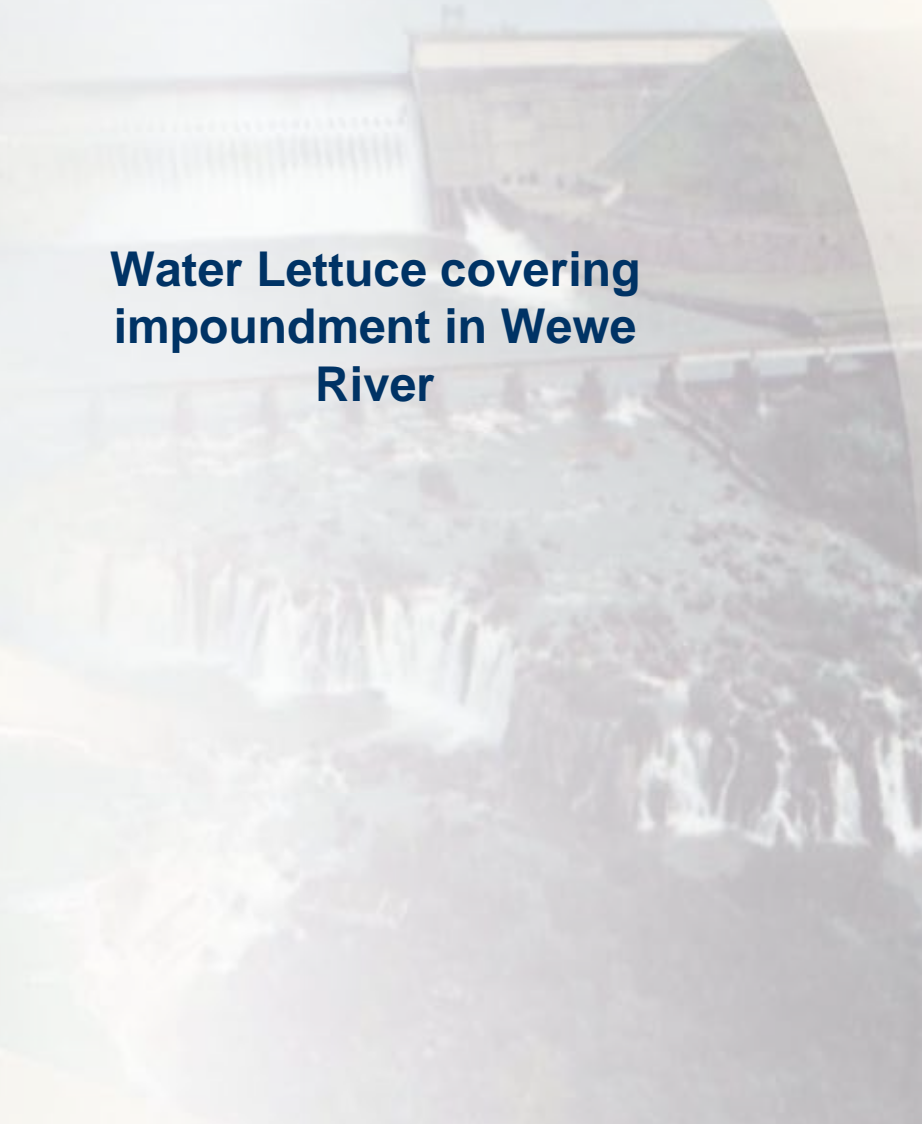


***Microcystis* bloom  
in Nagle Dam**

# ***Water Quality Assessment – Status***



**Water Lettuce covering  
impoundment in Wewe  
River**



# ***Effluent Re-use and Desalination - Objective***

- **Identify opportunities for re-use of industrial and treated sewage effluent to form part of the reconciliation strategy**
- **To develop desalination as an option in the reconciliation strategy**

# ***Effluent Re-use and Desalination - Procedure***

- **Determine locations, plant capacities and treatment processes used at wastewater treatment plants**
- **Collect discharge volume and water quality data of influent and effluent**
- **Understand future planning of wastewater effluent**
- **Identify re-use opportunities**
- **Determine and cost plant upgrades required for effluent re-use**
- **Determine lead times**

# ***Effluent Re-use and Desalination - Procedure***

- **Identify current and future initiatives at using desalination technologies to supply water in the study area**
- **Formulate options as part of the reconciliation strategies**
- **Cost desalination options for comparison to alternative supply options**
- **Determine lead times**

# ***Effluent Re-use and Desalination***

## **Status:**

- **Identified possibility of re-using treated sewage effluent from the Darvill works.**
- **Identified treated sewage effluent in the Tongaat area as a source to meet the growing water requirements to the north of Durban.**
- **Possibility of using treated sewage effluent to meet irrigation requirements in Mdloti catchment – reduce demand on Hazelmere Dam.**
- **Possibility of discharging treated sewage effluent into Hazelmere Dam.**

# ***Effluent Re-use and Desalination***

## **Status:**

- **Desalination a possibility of supplying the smaller coastal towns – Zinkwazi and Blythedale.**
- **Umgeni Water has initiated a pre-feasibility study to investigate desalination as an option for supply to Ethekwini.**

# ***Environmental Task***



# ***Environmental Task***

- **Objective:**
  - **Provide environmental input to development of recon strategies**
  - **Identify potential environmental flaws**

# ***Environmental Task***

- **Procedure**
  - **Collate desktop level information**
  - **Type of information will largely be GIS**
  - **Land cover, sensitive landscapes, natural history sites, red data species, ecological sensitive areas**
  - **Collect available ecological Reserve EWR information**
  - **Review reports on ecological requirements and impacts of schemes**

# ***Environmental Task - Status***

- **Workshop held with local enviro experts, Ethechini, DWAF RDM and Head office to address :**
  - **Reserve Studies**
  - **Current development**
  - **Future development plans**
  - **Water use licence applications**
  - **Established a priority list for Reserve determinations**

## *Environmental Task - Status*

### **Following priority list established:**

- **Mhlali River rapid level Reserve**
- **Tongati, Mdloti, Mhlanga River – Intermediate to Comprehensive**
- **Umkomazi – Have a rapid but need a comprehensive level Reserve**
- **Toti, Mbokodweni and Lovu need rapid level with capping flows**
- **Umgeni – for estuary, Terms of reference, scenarios to be included**

## *Environmental Task - Status*

### **Further conclusions from workshop:**

- **Look at discharge points for future treated sewage effluent so that effluent discharge can supply EWR.**
- **Study to motivate DWAF-RDM office to initiate studies to provide the Reserve information at the required level for input to the reconciliation strategies.**
- **Water level, flow and water quality monitoring to be started to support future Reserve determination work**

# ***Strategy Development*** ***(Current Views)***



# ***Current Perspectives (1 of 3)***

- **WC/WDM:**
  - **Potential for savings through wastage management (priority activity in all urban areas).**
- **South Coast Supply Area:**
  - **Ngwadini Dam (off-channel) to supply SAPPI Saiccor.**
  - **Investigate further off-channel storage to augment urban supply in short term.**
  - **Postpone decommissioning of existing small treatment plants until Mgeni System is augmented.**
  - **Implement bi-directional South Coast Pipeline Phase 1 (SCP1).**
  - **Undertake planning of the SCP2.**

# ***Current Perspectives (2 of 3)***

- **Mgeni River System:**
  - **Proceed with planning and implementation of Springgrove Dam and transfer infrastructure.**
  - **Proceed with planning of the Mkomazi River Augmentation Scheme.**
  - **Asses water reuse options (regulatory and infrastructural).**
  - **Strategy for improvement of waste water treatment required.**
  - **Evaluate Ecological Water Requirement flow release scenarios.**
  - **Planning of bulk conveyance:**
    - **Western Aqueduct and feeder conduits.**

# ***Current Perspectives (3 of 3)***

- **North Coast Area:**

- **Proceed with planning and implementation of Hazelmere Dam raising and related infrastructure.**
- **Implement bi-directional North Coast Pipeline.**
- **Assess re-use options.**
- **Obtain and assess planning information for, bio-diesel and organic farming initiatives.**
- **Proceed with planning of Ncgebo Scheme (recommendation from Water & Sanitation Master Plan for Illembe DM).**
- **Assess Mvoti River Water Resource Development Options.**
- **Need flow gauging structures on Mvoti River.**
- **Investigate desalination as an option for Zinkwazi.**
- **Evaluate water use monitoring and compliance control system of the Mvoti River.**



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# ***Study Management***



# Study deliverables

Deliverable	Details
<b>REPORTS</b>	
Literature Review report	Summary of information and reports
Inception report	Description of scope of work, study programme, project human and financial resources.
First stage strategy	Water requirement and return flow scenarios, Water conservation / demand management, Water resources, Infrastructure, Water Quality and re-use and Environmental.
Second stage strategy	Water requirement and return flow scenarios, Water conservation / demand management, Water resources, Infrastructure, Water Quality and re-use, Environmental and Documentation of strategy implementation procedure.
Executive summary	Layman friendly executive summary of strategy
<b>WORKSHOPS</b>	
Workshop 1	First demand and return flow scenario
Workshop 2	Second demand and return flow scenario
Workshop 3	First stage strategy
Workshop 4	Second stage strategy
Workshop 5	Other issues and concerns
<b>MODELS</b>	
Projection model	Water requirement projection model
WRYM /WRPM	Integrated water resources yield and planning model

# ***Study programme***

- **Main milestones:**
  - **Inception and literature review reports**
  - **First public meeting: 20 June 2007**
  - **First stage reconciliation strategy: December 2007**
  - **Second public meeting: March 2008**
  - **Second stage reconciliation strategy: February 2009**
  - **Third public meeting: April 2009**
- **Study Steering Committee (SSC) meetings (preliminary dates)**
  - **1: 27 February 2007 (Pre-consultation with key stakeholders)**
  - **2: 18 October 2007**
  - **3: 28 February 2008**
  - **4: 12 June 2008**
  - **5: 26 February 2009**

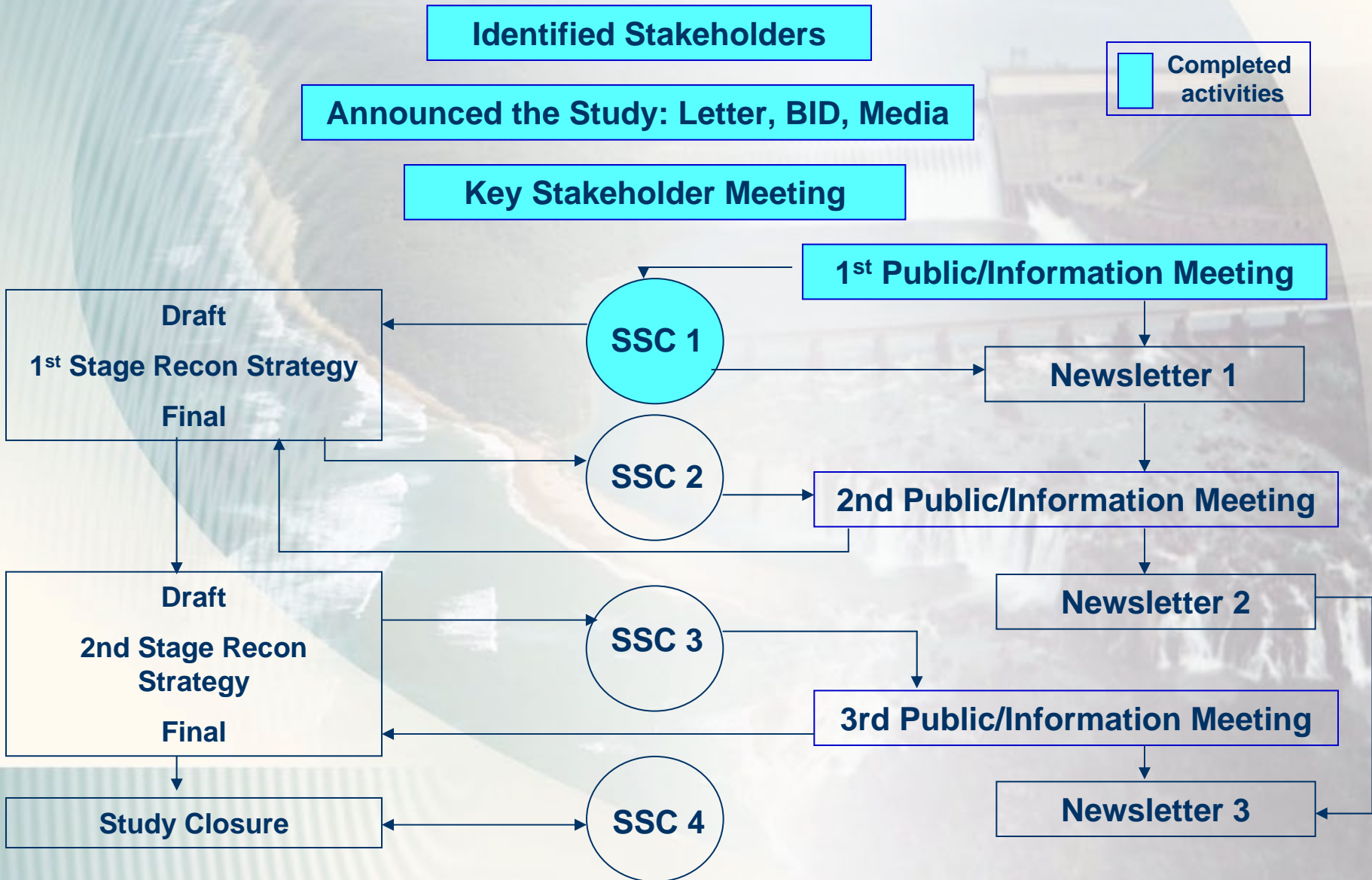
# ***Study Review and Strategic Guidance***

- **Review core documentation and key elements of work plan**
- **Attend stakeholder and Steering Committee meetings**
- **Give guidance and advice on items to be attended to**
- **Review results and conclusions, and assist with recommendations**

# ***Discussions and Comments***

# *Way Forward*

# Main Events





# ***Closure and Next Meeting***

