


## Implementation and Maintenance of the Water Reconciliation Strategy – KZN Coastal Metropolitan Areas


2<sup>nd</sup> September 2010

### Utilisation of Treated Effluent



### Re-use strategy process


<b>Phase 1: Project Scoping</b>	<ul style="list-style-type: none"> <li>• Agree on the project parameters (scope, battery limits, team, etc.)</li> </ul>	Feb 2009
<b>Phase 2: Options formulation and clarification</b>	<ul style="list-style-type: none"> <li>• Basis of design (flows and quality)</li> <li>• Key infrastructure components (including existing infrastructure and integration)</li> <li>• Integration with existing water infrastructure</li> <li>• Treatment Technology selection</li> <li>• Conceptual Engineering Design</li> <li>• Project Financial Modelling</li> </ul>	Mar – Nov 2009
<b>Phase 3: Options Evaluation</b>	<ul style="list-style-type: none"> <li>• Technical feasibility</li> <li>• Financial aspects</li> <li>• Social impacts and issues</li> <li>• Environmental impacts</li> </ul>	Nov-Dec 2009
<b>Phase 4: Implementation plan for go forward option</b>	<ul style="list-style-type: none"> <li>• Project description (key features and basis of design infrastructure)</li> <li>• Key project risks</li> <li>• Project phasing and schedule</li> <li>• Detailed project cost</li> <li>• Environmental Impact Assessment</li> </ul>	Jan-Dec 2010



### Broad-scale re-use options

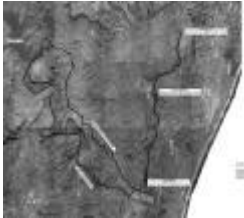
Indirect re-use to either upstream or downstream of Inanda	Option discontinued at screening level due to financial and environmental concerns associated with pipelines
Indirect re-use released direct to Hazelmere dam utilizing existing water treatment and distribution infrastructure.	Option discontinued at Scoping level due to inflexibility for future demand growth, financial and environmental concerns associated with pipelines and disposal of brine
Direct re-use pumped straight into northern reservoirs/distribution system	A number of configurations assessed including: <ul style="list-style-type: none"> <li>• Pumping effluent to a centralised point;</li> <li>• Dedicated works at each site</li> <li>• Dedicated pipelines</li> <li>• Pumping into existing pipelines</li> </ul>

Technical feasibility, financial considerations, environmental and social




### Options refinement

- Growth in Durban will be concentrated in the northern area of the city resulting in the study's focus on the larger Works situated in the North where the greatest growth in demand is also expected.
- Direct and in-direct re-use options were considered in terms of feasibility, cost, likely environmental effects, and timing.
- The capacity of the water treatment plant, which is supplied by Inanda dam, and the trunk mains leading from that plant to the northern areas of demand growth, are at or near capacity.



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### Conclusion of options analysis

Treatment Works Catchment	Current Inflow Ml/day	Projected Additional Water Consumption per Catchment (Ml/day):				Projected return flows		Projected Potable Water Ultimate (80% of return flow) 51.2
		Priority Areas 0	Other Greenfields 5.0	Densification to SDP Derivatives 7.0	Total 12.0	Additional 10.0	Ultimate 64.0	
Northern	54				12.0	10.0	64.0	
KwaMashu	66.6	7.7	0.9	8.4	17.0	14.1	80.7	64.6
Umhlanga / Phoenix	23.4	22.0	24.7	6.7	53.4	44.3	67.7	54.2

■ Treated sewage effluent from the KwaMashu and Northern WWTW's, is reclaimed and treated to potable standard. The potable water from KwaMashu potable water reclamation plant is discharged into the existing trunk main of the northern aquaduct in the vicinity of Duffs Road while the potable water from the Northern WWTW is discharged to the northern aquaduct in the at the nearest point approximately 3.5 km from the works.

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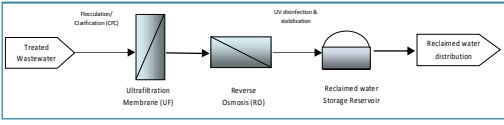


### Direct re-use technology options


- Robust & able to deal with variable treated sewage effluent qualities from the existing sewage treatment plants;
- Multiple barriers of treatment to deal with all categories of pollutants;
- Energy requirements for treatment processes;
- Operating & maintenance cost; and
- Proven technology with full scale reference plants

**Membrane Treatment**

Coagulant dosing; Coagulation/flocculation; Clarification; Ultra filtration; Reverse osmosis; UV disinfection; Stabilisation; and Chlorine based disinfection.



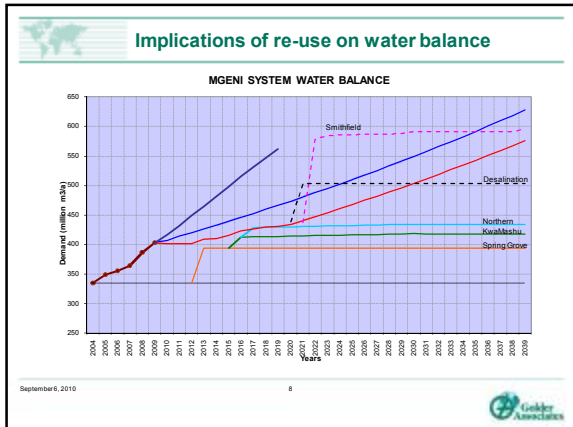


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### Go forward options

- Northern WWTW**
  - A pumping station located at the Northern potable water reclamation plant will pressurise the potable water to emulate the pressure regime created by Durban Heights WTW (280 m above ms) and introduce the water into the northern aquaduct trunk main as near to the site as practical through a 3.5 kilometre steel pipeline.
- KwaMashu**
  - A pumping station located at the KwaMashu potable water reclamation plant will pressurise the potable water to emulate the pressure regime created by Durban Heights WTW (280 m above ms) and introduce the water into the northern aquaduct trunk main in the vicinity of Dufts road via a 900mm, 1.9 kilometre steel pipeline.

### Way forward

- More detailed technical descriptions of the project options;
- More considered analysis of influent quality
- Environmental Impact Assessments

