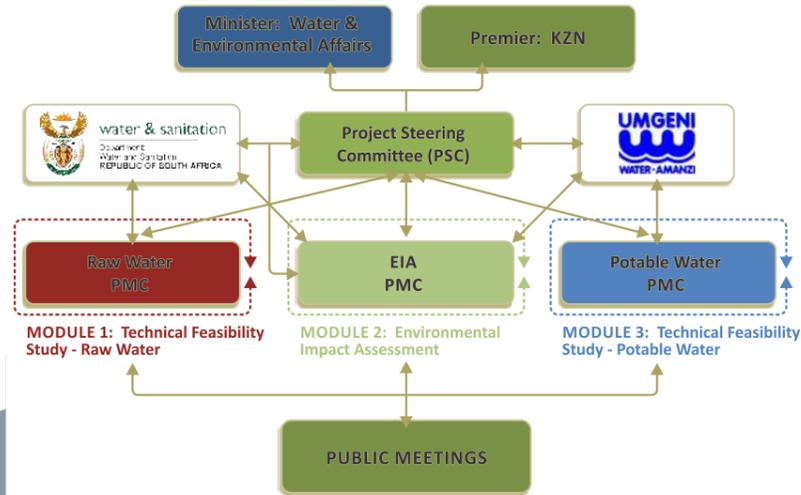
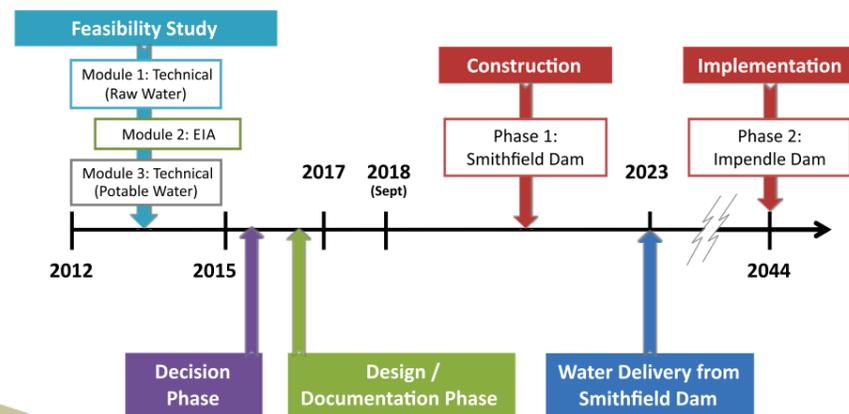


# Governance

Because the project aims to augment water supply to the Mgeni system, an area that is managed by Umgeni Water with users mainly from eThekweni Municipality, this study requires participation from the three spheres of government, as well as from key stakeholders in the water sector. An extensive public participation process will be followed as part of the EIA (Module 2).

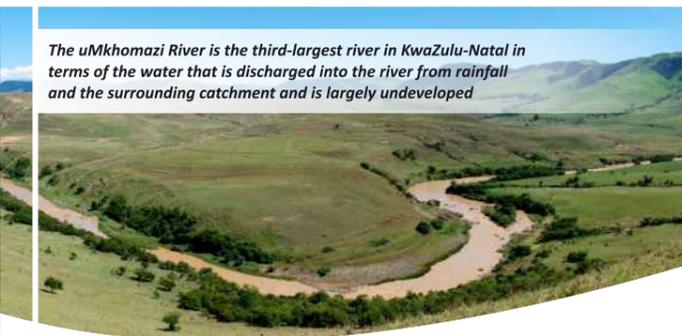


# Project Programme



# Phase 1 uMkhomazi Water Project

The uMkhomazi River is the third-largest river in KwaZulu-Natal in terms of the water that is discharged into the river from rainfall and the surrounding catchment and is largely undeveloped



<b>Reconnaissance</b>	<ul style="list-style-type: none"> <li>&gt; Needs Identification</li> <li>&gt; Identification and selection of possible interventions</li> </ul>
<b>Pre-feasibility</b>	<ul style="list-style-type: none"> <li>&gt; Preliminary investigation of alternatives (options)</li> <li>&gt; Identify best options for detail study</li> </ul>
<b>Feasibility</b>	<ul style="list-style-type: none"> <li>&gt; Detail investigations and assessment of best options</li> <li>&gt; Recommendation of project</li> </ul>
<b>Decision Support</b>	<ul style="list-style-type: none"> <li>&gt; Environmental approval</li> <li>&gt; Reserve determination</li> <li>&gt; Public involvement</li> <li>&gt; Initial funding and institutional arrangements</li> <li>&gt; Some optimisation</li> <li>&gt; Decision to implement</li> </ul>
<b>Design / Documentation</b>	<ul style="list-style-type: none"> <li>&gt; Formalise institutional arrangements</li> <li>&gt; Secure funding</li> <li>&gt; Procurement procedures</li> <li>&gt; Engineering design and construction documentation</li> </ul>
<b>Construction / Implementation</b>	<ul style="list-style-type: none"> <li>&gt; Procurement</li> <li>&gt; Resettlement and compensation</li> <li>&gt; Construction</li> <li>&gt; Impounding and commissioning</li> </ul>

The Department of Water and Sanitation (DWS) is exploring options to meet the long-term water requirements of the almost six million domestic and industrial water users in the Durban and Pietermaritzburg regions of KwaZulu-Natal. To this end, it is currently implementing a **Technical Feasibility Study** as part of the uMkhomazi Water Project (uMWP), which aims to explore the preferred options for supplying water to meet the long-term requirements of water users in eThekweni Municipality's area of jurisdiction.

The uMWP can harness and transfer water from the uMkhomazi River to the existing Mgeni System, thereby developing the uMkhomazi River, augmenting the Mgeni System's water supplies to downstream users and ensuring that the area's long-term water requirements can be met. The project area focuses on the uMkhomazi, uMlaza and uMngeni River catchments.

By developing the uMkhomazi River and using its supplies to augment current systems, the DWS's long-term vision for reliable, efficient and sustainable water supplies for the economic hub of KwaZulu-Natal is being realised. In a water-scarce country

such as South Africa, the DWS is taking careful steps to optimise our current water resources to ensure sustainable supplies to support our developing economy.

Once completely developed, phase 1 and 2 of the uMWP will be the largest water transfer scheme in South Africa, comparable to the Lesotho Highlands Water Project in terms of water volume and tunnel lengths and diameters.

# Contact Details



**DEPARTMENT: WATER AND SANITATION**

**UMGENI WATER**

**MODULE 1: Technical Feasibility Study - Raw Water**

**MODULE 2: Environmental Impact Assessment - Nemai Consulting**

**MODULE 3: Technical Feasibility Study - Potable Water**

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## Mgeni System Water Balance

The Mgeni System is the main water source that supplies about six million people and industries in the uMgungundlovu District, eThekweni Metropolitan and Msunduzi Local Municipalities' areas of jurisdiction, all of which comprise the economic powerhouse of KwaZulu-Natal.

The Mgeni System comprises the Midmar, Albert Falls, Nagle and Inanda dams in KwaZulu-Natal, a water transfer scheme from the Mooi River and the new Spring Grove Dam.

The system on its own cannot provide enough water to meet the long-term water demands that will be placed on it. It has a yield of 334 million m<sup>3</sup>/year (measured at Inanda Dam) at a 99% annual assurance of supply. The short-term augmentation measure, Phase 2 of the Mooi Mgeni Transfer Scheme (the recently completed Spring Grove Dam), will increase yield from the Mgeni system by 60 million m<sup>3</sup>/year. However, this will not be enough to meet long-term water requirements in the Durban and Pietermaritzburg areas.

Pre-feasibility investigations, undertaken by the DWS a few years ago, indicated that the uMWP, which entails the transfer of water from the uMkhomazi River to the Mgeni system, is the scheme most likely to fulfil this requirement.

## Augmentation to Meet Long-term System Requirements

Eight alternative schemes were identified in previous studies, but only the Impendle and Smithfield scheme configurations emerged as suitable for further investigation.

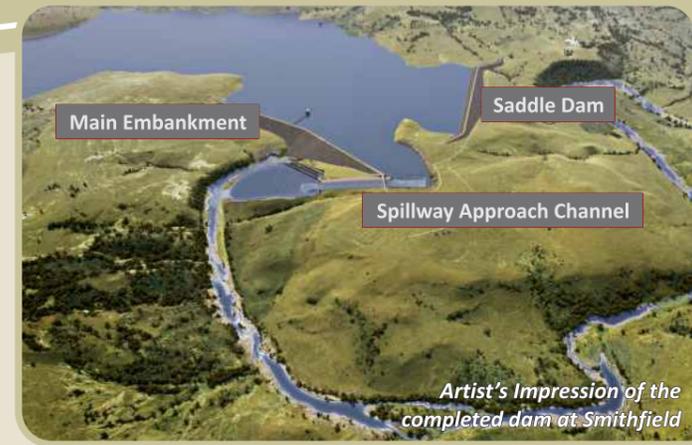
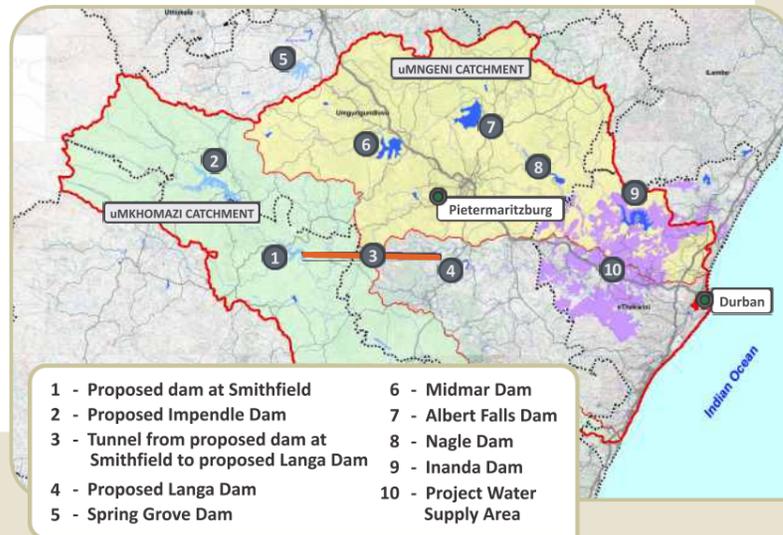
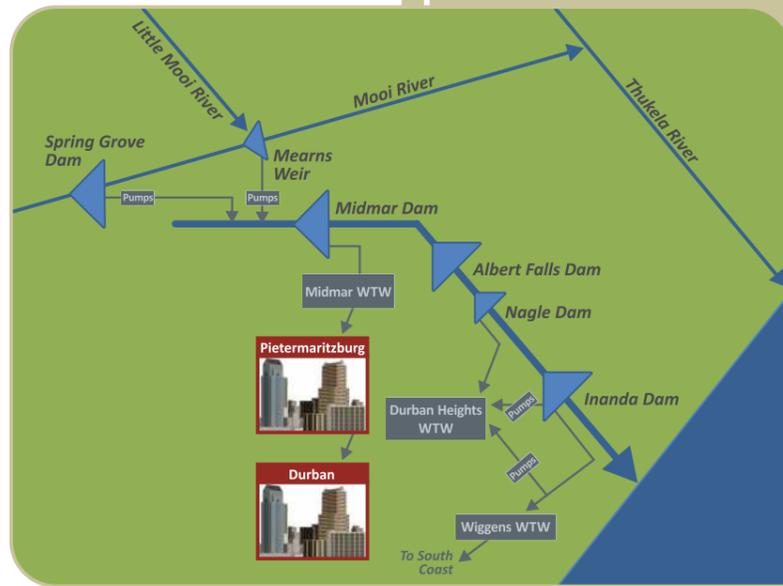
The pre-feasibility investigation, concluded in 1999, recommended that the Smithfield Scheme be taken to a detailed **Feasibility-level Investigation** as its transfer conveyances would be independent of the Mgeni System, thus reducing the risk of limited or non-supply to eThekweni and some areas of Pietermaritzburg, and providing a back-up to the Mgeni System.

## Layout of Scheme

Preliminary indications are that the first phase of the uMWP would comprise of:

- > A proposed new dam at Smithfield on the uMkhomazi River, with a gross storage volume of 251 million m<sup>3</sup> (31% MAR dam).
- > Water conveyance infrastructure (including a 32 km long tunnel and a pipeline) and a balancing dam on the Mbangweni River.
- > A water treatment works in the uMlaza River valley.
- > A potable water gravity pipeline to the Umgeni Water bulk distribution reservoir system, below the reservoir at Umlaas Road.
- > From the reservoir at Umlaas Road, water will be distributed under gravity through existing infrastructure to eThekweni.
- > The proposed dam at Smithfield has been identified as having a 99% assured yield of about 220 million m<sup>3</sup>/year.

Phase two of the uMWP will be implemented when needed, and will comprise the construction of a second large dam at Impendle further upstream on the uMkhomazi River to release water to the downstream proposed dam at Smithfield.



## Proposed dam at Smithfield

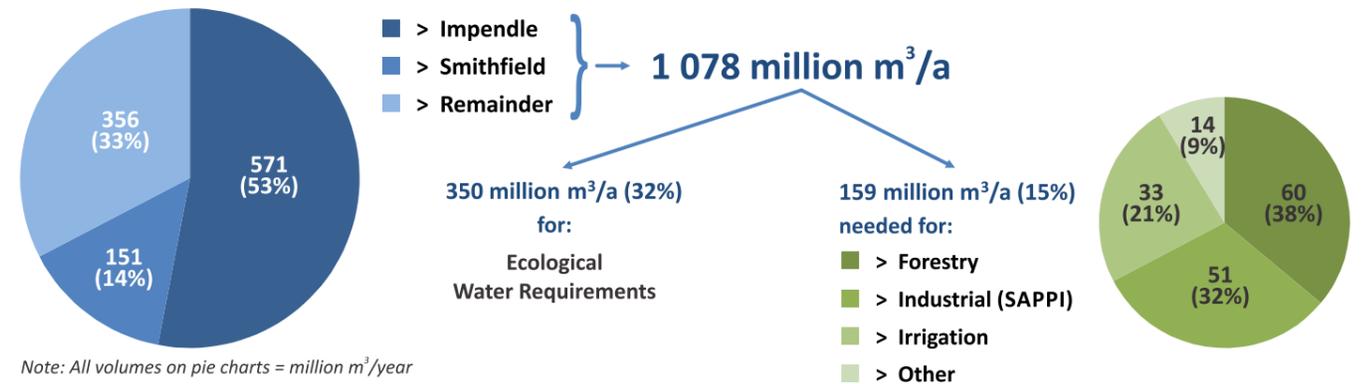
Preliminary analyses indicate that the preferred layout for the proposed dam at Smithfield is an 81 m high zoned earth core rockfill dam, with a 26 m high earthfill embankment saddle dam. A tunnel of 3.5 m in diameter, and a new 46.6 m high balancing dam for supply during inspections and maintenance of the tunnel in the uMlaza River catchment area, will form part of the scheme.

## Water Use & Availability in the uMkhomazi River Catchment

First results show that the uMkhomazi River catchment generates 1 078 million cubic metres of water each year, 67% of which is generated upstream of the Impendle and Smithfield dam sites.

The catchment is fairly undeveloped and only about 15% of the runoff is currently being used, mostly for agricultural purposes and for the industrial user, SAPPI-SAICCOR, which is near the mouth of the uMkhomazi River at the town of Umkomaas.

Another 32% of the catchment runoff is earmarked for ecological water requirements to sustain the system's riverine health at a desirable level after the uMWP has been completed.



Note: All volumes on pie charts = million m<sup>3</sup>/year

## Feasibility Study Approach

To expedite the study's progress, the feasibility study has been divided into three modules, which run concurrently. Some tasks within the project's modules will also include surrounding catchments (the uMgeni River and the uMlaza River catchments).

### Module 1

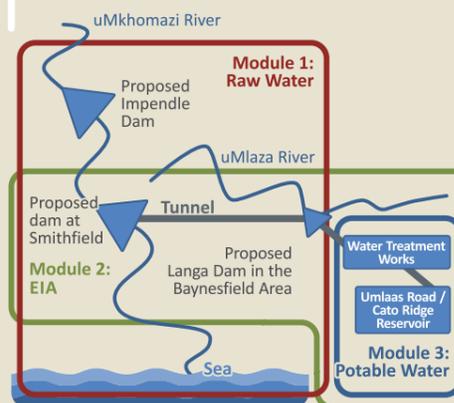
#### Technical Feasibility: Raw Water

- > Investigate proposed dam at Smithfield (Phase 1) to a detailed feasibility level.
- > Investigate the availability of water from Impendle Dam (Phase 2) as a future resource to release to proposed dam at Smithfield, and refine the phasing of the selected schemes.
- > Optimise the conveyance system between proposed dam at Smithfield and the proposed Baynesfield Water Treatment Plant.
- > Undertake a water resources assessment of the uMkhomazi River Catchment, including water availability to the lower uMkhomazi.
- > Evaluate the options for a balancing dam.
- > Investigate the social and economic impact of the uMWP.

### Module 2

#### Environmental Impact Assessment

A full EIA, according to the requirements of the National Environmental Management Act, will be undertaken, including Public Participation.



### Module 3

#### Technical Feasibility: Potable Water

- > Investigate required sizing and possible locations for water treatment works and water reservoir.
- > Determine diameter and pipeline routes for water pipelines between Baynesfield and the Umlaas Road precinct.
- > Reconcile infrastructure sizing and timing with the projected growth in downstream water demands.
- > Undertake geotechnical investigations at proposed water treatment works site and along the proposed pipeline route.
- > Undertake engineering survey at proposed water treatment works site and along the proposed pipeline route (this includes determining the extent of public and privately owned land that may be affected).