

## Water reuse

### Decision support for municipal wastewater reuse

A completed WRC-funded study has developed a decision-support tool for the selection and costing of direct potable reuse systems from municipal wastewater.

#### Background

Water service authorities (WSAs) in South Africa currently face a challenge with sustainable supply of sufficient quantities of good quality potable water to the population due to the highly variable availability of raw water. To address the water shortages, WSAs are increasingly investigating alternative raw water resources, of which reclamation and reuse (from treated wastewater) and desalination (both brackish and seawater) are the most important.

The possibility for reuse of water is compromised by the poor state of many wastewater treatment works, and although water reuse needs to be considered for future water supply, the reality in most municipalities is that the wastewater treatment works cannot produce the required water quality standard at a reliable level of confidence.

Hence, the upgrading of the existing infrastructure together with the introduction of proper operations and maintenance measures and management oversight are required to ensure a sustainable and safe water supply.

#### Tools for decision-making

The overall objective of this WRC project was to provide decision-makers with tools to compare options for water reuse schemes. The tools are based on a number of drivers, such as technical, water quality, costing, environmental, social and cultural aspects.

More specifically, the aims of the model are to collate existing expertise and information for planning and implementation of potable water supply and direct potable reuse projects, and to provide decision-support guidelines and methodologies in the form of a spreadsheet-based, multi-criteria decision support model.

This will enable municipalities to identify, evaluate, compare and select appropriate options for water reclamation and reuse.

#### Reuse model

The resultant guide introduces a reuse costing mode, REUSECOST.

The aim of the decision-support model are to collate existing expertise and information for planning and implementation of potable water supply and direct potable reuse projects, and to provide a decision-support system in the form of a spreadsheet-based, multi-criteria decision support model (named REUSEDMS).

The project focused on direct potable reuse as a water-supply option to augment conventional water sources in water scarce areas. While many of the selection criteria considered in developing the decision support model could equally apply and be used for evaluating indirect potable reuse options, the indirect reuse schemes were not considered due to the additional drivers and considerations that are involved, such as receiving water quality management (dam, river or aquifer), environmental and institutional aspects, among others. This was beyond the scope of this project.

In developing the decision support and costing models, the raw water feed to the water reclamation plants was limited to secondary treated effluent from municipal domestic wastewater treatment plants. In terms of feed water quality, mine effluent and industrial effluents were therefore excluded.

The REUSEDMS was presented to the South African water sector at two technology transfer workshops in Pretoria and Stellenbosch in 2014.

#### Further reading:

To order the report, *Decision-support model for the selection and costing of direct potable reuse systems from municipal wastewater (Report No. 2119/1/14)* contact Publications at Tel: (012) 330-0340, Email: [orders@wrc.org.za](mailto:orders@wrc.org.za) or Visit: [www.wrc.org.za](http://www.wrc.org.za) to download a free copy.