Groundwater can help alleviate CT's water shortage

According to engineers and scientists at SRK Consulting's Cape Town office, the aquifers in the greater Cape Town area could offer some relief if the current drought conditions endure by taking pressure off the demand for potable water.

“Groundwater sources such as the Cape Flats Aquifer and the Newlands Aquifer could be accessed relatively quickly, and people are regularly filling up containers from one of the springs associated with the latter aquifer,” said SRK corporate consultant Peter Rosewarne. “It would also be useful to conduct an audit of groundwater use in the greater Cape Town area – and to see how much more capacity could be legally and sustainably developed by individual landowners.”

Drilling of borehole at school in Atlantis.

Rosewarne cautions that even if fully developed, groundwater resources could only supply a relatively small percentage of the city’s water needs. However, there is a great deal of scope for using non-potable groundwater for industrial purposes and domestic irrigation.

Strategically placed boreholes

SRK associate partner and principal hydrogeologist Desmond Visser proposed the installation of strategically placed boreholes or well-fields in neighbourhoods where the groundwater resource potential is good, to supply irrigation water to homeowners, parks, public buildings and sports fields.

“There are many areas in the city, probably at least 70% of the Cape Town area, where there is sufficient groundwater for this to be feasible,” said Visser. “Such a system would reduce the demand on the potable water supply by a considerable margin during the summer months. In the same way, many schools could have boreholes to supply irrigation water for sports fields and gardens.”

Groundwater sources at schools

Elements of these ideas have already been implemented - SRK’s Cape Town office are part of the provincial Department of

Transport and Public Works programme to find and develop groundwater sources for new and upgraded schools. Since 2011, over 50 schools have been provided with boreholes as part of this programme, saving at least 500,000m^3/a of water (equivalent to 200 Olympic size swimming pools) that would have had to come from treated municipal supplies. SRK believes that this irrigation programme should be expanded to include nearly all schools, public parks and many buildings in the Western Cape.

Irrigation of newly seeded sports filed at school in Delft.

These 'neighbourhood boreholes' could even make a vital contribution to community safety in the light of ongoing shack fires in informal settlements.

"An idea that has been mooted by SRK is the use of such strategically sited boreholes to help fight shack fires," said Rosewarne. "These boreholes – equipped with vertical turbine pumps – could supply water more quickly than conventional fire tenders."

Lowering the water table

A further use of boreholes extracting groundwater could be to lower the water table in low-lying, flood-prone areas – on the Cape Flats particularly; this could reduce the flood risk as aquifers would be better able to absorb the excess run-off water, he said. Much of this flooding is due to rising water tables, rather than rivers bursting their banks.

Other avenues involving groundwater that are worth more investigation include: the labyrinth of tunnels and springs beneath the City of Cape Town, tunnelling into the Table Mountain Group Aquifer, and collaboration with local sand mines and quarries which dewater their operations continuously.