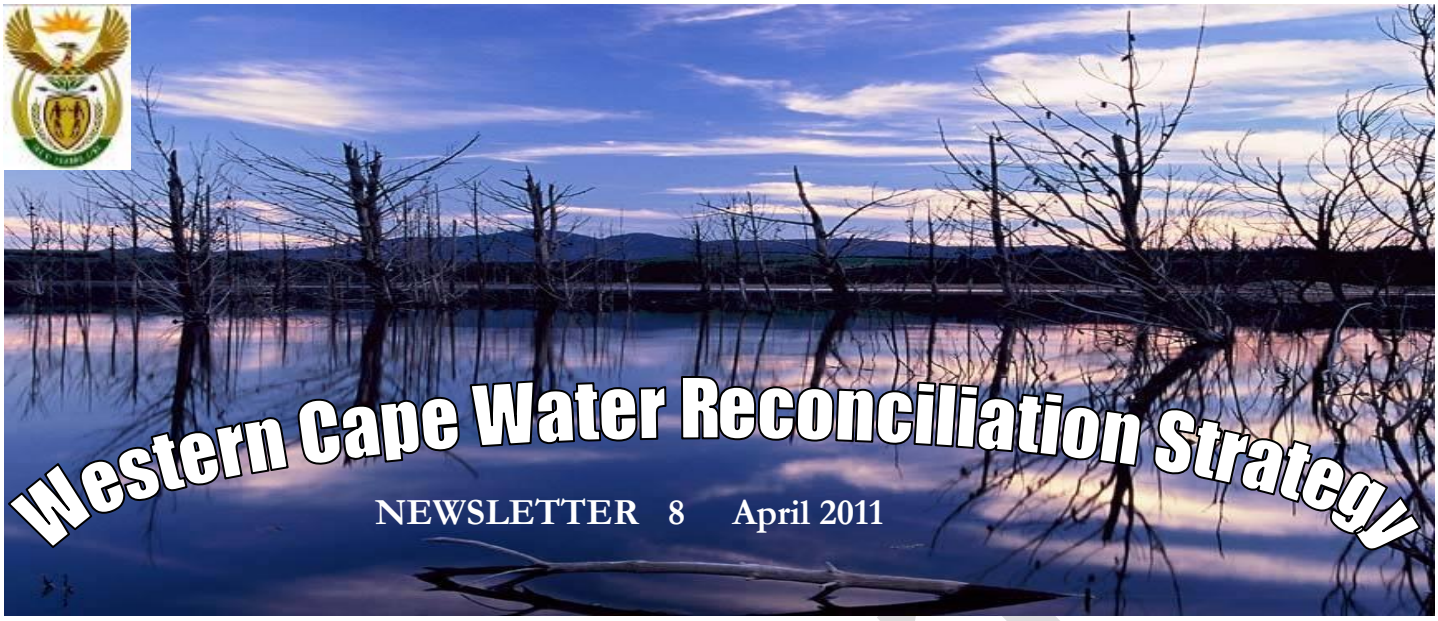

Surface water augmentation options: we are scraping the barrel

Population growth (and the subsequent economic growth) is putting an exponential strain on the water available to the users of the Western Cape Water Supply System (WCWSS). At present the system can safely provide 556 million m^3 per year (after allowing for environmental flow releases). The 2010 water requirement was already 511 million m^3, of which 32% was used by the irrigation farmers and 68% by the urban dwellers in and around Cape Town and the West Coast. According to projections, the remaining 45 million m^3 will be fully utilised anywhere between 2017 and 2019 – depending on the growth in the area and the further successful implementation of the City of Cape Town's water conservation and water demand management programme.

In addition, the recently completed Catchment Management Strategy for the Breede-Overberg CMA has indicated that very little additional water is available for possible transfer into the WVWSS, and that no additional water should indeed be made available from the Breede River system before the 20-year old hydrology information has been updated.

Two of the surface water options being studied at the moment is the transfer of water from the Berg River for storage in the Voëlvlei Dam, and diverting winter water above an agreed threshold from Michell's Pass (Breede catchment area) to the Klein Berg River for use in the WCWSS.

In addition to the research being done on groundwater and utilising the TMG aquifer as a water resource, the City of Cape Town is also determining the feasibility and cost of water re-use and desalination (read more on page 2).

The map shows the main storage dams in the system, and how all these are connected to one another in order to operate the system at its maximum efficiency and not let any dam spill unnecessary

Using the best storage space ever

South Africa's high temperatures and windy conditions often result in great evaporation losses from our storage dams. The vast, flat surface of the Vaal Dam is a specific point in case. So why not utilise underground aquifers?

Known as Aquifer Recharge or Water Banking, utilising our underground aquifers to store excess water during times of plenty for subsequent abstraction is fast becoming an attractive option as an additional water supply – especially for water-stressed communities. However, the beauty of such sub-surface storage is that one can also use aquifers to store treated waste water and storm water, transferring groundwater from one aquifer to another, or to further improve water quality by using sand to filter the water.

In the area of the WCWSS, Atlantis is an excellent example of how the City of Cape Town has already for 30 years been successfully recharging the aquifer with treated waste and storm water. This is done by creating a basin (similar to a wetland – see photograph) and feeding this area with treated water that slowly filtrates through the sand or gravel into the aquifer. About 30% of Atlantis' groundwater supply is recharged in this way.

A recent study by the West Coast District Municipality to augment the Langebaan Road aquifer by means of injecting surplus winter water from the Berg River into the aquifer for use during te summer months, has not been as successful. What was thought to have been a confined aquifer of sands and gravels capped by a layer of impermeable clay, unfortunately seems to be "punctured" by over-abstraction and boreholes being drilled through the impermeable clay layer into the lower aquifer system. Further studies will be done, which will include the possibility of closing off all boreholes penetrating the Lower Langebaan Road Aquifer System.

A study for the Department of Water Affairs on various aquifer recharge options was completed by Dr Ricky Murray in November last year. Artificial recharge maps have, *inter alia*, been drawn up for each water management area. More information is available on *www.artificialrecharge.co.za*

Integrated Water Resource Management in the Western Cape under the spotlight

At the Western Cape Water Indaba held in Cape Town in December 2009 the national Minister of Water and Environmental Affairs identified the importance that the strategies of all sectors impacting on and dependent on water are aligned with the key water management principles for the province – whether agriculture or mining, manufacturing or housing.

The Provincial Department of Environmental Affairs and Development Planning, in conjunction with the National Department of Water Affairs (DWA), other Provincial Departments and Local Government in the Western Cape has therefore been tasked to develop a Provincial Integrated Water Resource Management (IWRM) Action Plan that identifies short (1-5 years), medium (6-15 years) and long term (15 years +) actions to guide implementation of projects / activities and future development priorities towards achieving integrated water resource management.

As a first step in the process towards developing the IWRM Action Plan, a Status Quo Report is being compiled of the current situation, the existing challenges, and the current and proposed planning in relation to water resource management and growth and development in the Western Cape. This will be a draw-down of all existing information available to determine the quantity and quality of available resources. In addition, all legislation pertaining to water management will also be perused to identify gaps, inconsistencies, opposing legal prescriptions, and the policies and guidelines (or lack thereof) that make sure that water is taken into account before decisions are made.

The first round of public meetings to relay the information already gathered and to obtain additional information has been held. This information will now be used to inform the development of the IWRM Action Plan, which will once again be communicated to stakeholders by means of public meetings later in the year. Cannot see the rest

Further information can be obtained from the website:…….. or by contacting …….

Running out of water is no option – we need to become inventive

Almost everywhere in South Africa, the wastewater discharged from sewerage plants is released into a river where it mixes with the water in the stream – only to be abstracted further downstream by another town as its source of drinking water (and purified to the required drinking water standard). No drop is therefore squandered, and very bit of water is used in the most cost-effective way possible.

Not so in our coastal towns and cities, where the wastewater from sewerage treatment works is discharged into the sea – never to be used again.

With water supply options becoming less and less, the City of Cape Town realises the potential of a vast water resource that is currently being dumped, unutilised, into the sea just because there is no river downstream. If this water could rather be diverted into a water body (such as a dam) where it is augmented with rain or river runoff, it could go a far way in meeting the increasing water requirements of the city without further compromising our already stressed river systems.

The water we use every day is as old as the planet. We cannot make extra water; we can only use what is available sensibly and sustainably, and without any further detriment to the environment

It will, however, mean that additional storage space will be required. Initial research has shown that the best option for additional storage could be to raise the wall of the Lower Steenbas Dam, which will enable the treated effluent to mix with the reasonably unpolluted run-off from the mountains and with the good quality water transferred from the Palmiet River catchment via the Eskom Pumped Storage Scheme.

Such a scheme could potentially make available 80 million m^3 of water per year – which will go a long way in meeting future water requirements.

Unfortunately it will take a number of years for such a scheme to become operational, as the building of a dam or the raising of a dam wall is a lengthy process. The Berg River Dam, for example, took 19 years from inception to becoming operational. Being aware of these time frames, the City of Cape Town will be embarking on a feasibility study on the re-use of water in the first half of 2011. This study will determine the most viable waste water treatment works to use for this option, as well as the possible structural and operational changes required in order to re-use the water.

The "yuck" factor

There is the possibility that people of Cape Town could oppose this re-use of water, for whatever reason there may be. However, the fact that water is successfully re-used all over the world, will hopefully waylay any fears there may be of the water being unsafe or unsuitable.

One of the prerequisites in the re-use of water will be the use of reverse osmosis. With this method, wastewater is forced through thin membranes with holes so small that water molecules are about the only things that get through. It is the same technology that is used to desalinate seawater and stops just about everything.

Wastewater is the only water supply that will grow as the population of the world increases

Desalinated seawater has to be mixed with raw water before it is purified for potable use. The same applies to wastewater that has gone through the reverse osmosis process. The only difference is that it will be placed in existing dams, where it will have the added advantage of being mixed with more freshwater and will be subject to a settlement period. In fact, wastewater re-used in this way will be 'cleaner' than desalinated seawater!

In addition… you may not know it, but you may already have drunk treated effluent that was discharged into a river, abstracted and purified by a municipality downstream and then supplied to your tap. Johannesburg is a typical example…

By re-using water we are not only stretching our water resources so much further. We are also discharging less wastewater in our river systems, thereby increasing the health of our rivers and stopping the further degradation of our environment.

Re-using water makes sense. It is done in most towns and cities in the world… so why not in Cape Town?

Any more suggestions for page 4??

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