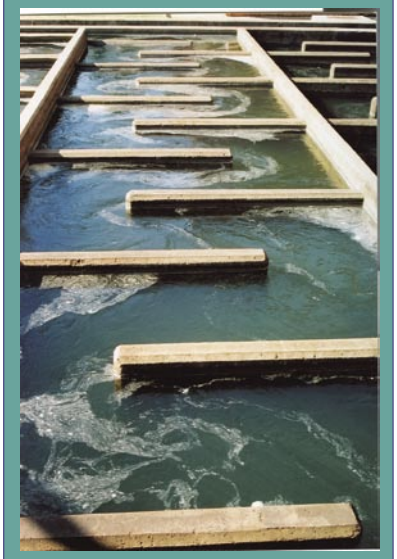
New handbook makes water treatment clear



The Water Research Commission, with input from the Water Institute of Southern Africa, has published a *Handbook for the Operation of Water Treatment Works.*

Rather than being an instruction manual or task list, the handbook's purpose is to provide comprehensive information specifically on all aspects related to the treatment of water for domestic use. According to the authors, sufficient background and process descriptions are provided to enable a proper understanding of the functioning of the different processes and on aspects such as the suitability of processes for different types of water and the limitations of different processes.

To order the handbook (WRC Report No TT265/06) contact Publications at Tel: (012) 330-0340 or E-mail: publications@wrc.org.za

Agreement to improve shared basin management

Courtesy of SA Tourism

Asigned agreement between the Southern African Development Community (SADC) and the United States Agency for International Development (USAID) could see the improved management of selected shared rivers basins in southern Africa. The agreement, signed in April, seeks to promote integrated management of shared water resources to help alleviate poverty, enhance equity, and promote and protect biodiversity.

It is reported that the agreement provides a framework for coordination and collaboration in the water sector that includes an ongoing programme to improve management of the Okavango Basin; and new activities jointly identified with SADC that support implementation of the Revised Protocol on Shared Watercourses.

SADC and USAID will assist river basin institutions in providing more effective services for river basin planning, biodiversity protection and conflict mitigation as well as helping selected communities to manage watershed resources.

SA & France join hands for water

A new research collaboration initiative between South Africa and France hopes to build much needed capacity in the local water science sector.

The Joint South Africa-French Network for Research in Water Science & Technology or SAFe Water was officially launched earlier this year. The programme aims to support the development of and cooperation in water science and technology between South African and French research teams. Each country has set aside R2,4-million over the next four years for the programme.

Three strategic themes have been identified, namely hydrometeorology, water quality and treatment, and water management. It is hoped that joint research projects will be established under these themes this year. The programme will enable researchers to use specialised facilities in each other's countries and help researchers to submit joint research proposals to funding bodies such as the European Union, among others.

The Water Research Commission (WRC) is acting as the implementing agent for the programme. According to Dr Innocent Msibi, WRC Director: Water-centred Knowledge, the programme should go a long way in alleviating some of the capacity shortages experienced in the South Africa water science community at present. "It has long been recognised that the local water science fraternity is ageing. Through SAFe Water we hope to bring at least 36 new young researchers from all backgrounds into the fold," he told *the Water Wheel.*

- For more information, visit www.wrc.org.za or www.nrf.ac.za

Funds sought for irrigation schemes

The Eastern Cape government is organising a donor conference to attract funds for its plans to revive several irrigation schemes in the province.

According to government news agency BuaNews, the provincial Department of Agriculture has budgeted R30-million this year for the revitalisation of irrigation schemes in Tyefu, Keiskammahoek, Zanyokwe, Qamata, Ncora and Shiloh. However, departmental spokesperson Yam Yankee reports that additional funds were required in the medium term.

Sustainability course for teachers

eThekwini Water and Sanitation has been working in partnership with the Wildlife and Environment Society of South Africa and Rhodes University over the past year to develop an accredited professional development course for teachers.

The course, funded by the Development Bank of Southern Africa, has been named 'Schools and Sustainability' and has been registered at Rhodes University as a 12-credit short course aligned to a module of the Advanced Certificate in Environmental Education.

The course focuses on integrating environment into the curriculum and develop skills such as lesson planning within the Revised National Curriculum Statement, developing and adapting learning support materials, assessment, active learning and whole school development. The course was successfully piloted with teachers from Durban during 2004, with a second group of teachers successfully completing the course in 2005.

At this stage the course is only available in KwaZulu-Natal, but plans are being put in place to extend it to other parts of the country.

Fore more information, contact Teddy Gounden at Tel: (031) 311-8667 or E-mail: teddygo@dmws.durban.gov.za

The first group of teachers to graduate from the new Schools and Sustainability course.

New website for African researchers

A new website has been launched to help African scientists take part in water research funded by the European Union (EU). African Water (www.africanwater.net) is a two-year project to increase involvement of African researchers in the water-related components of EU Framework Programme 7, which will be officially launched next year. Promoted by the EU Water Initiative's Research Working Group the website provides African-specific information about participation in FP7. It is carries newsletters, and electronic news bulletins, including the latest information about the framework programme.

R3,1-m windfall for Limpopo project

The Vaalbank land care project in the greater Marble Hall area has received a R3,1-million windfall from the Department of Environmental Affairs & Tourism (DEAT).

The funds will be applied in removing alien plants, fencing ploughing fields and erecting grazing camps to reduce soil erosion, reports government news agency BuaNews. DEAT has also earmarked R5-million for Limpopo's Sekhukhune district this year for reforestation projects.

Water by numbers

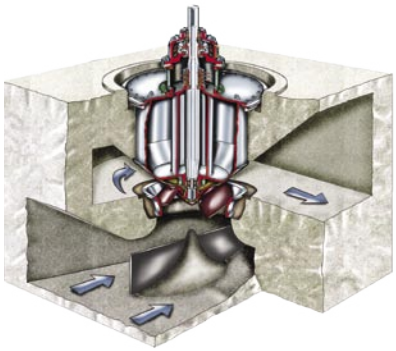
- **R400-million** – The value of the Gariep Bulk Water Scheme, which has been launched in Middelburg, in the Eastern Cape. The project involves drawing water from the Gariep Dam to serve communities in Middelburg, Hofmeyr and surrounds.
- **65%** – The percentage of water consumers in Nairobi, Kenya, who have experienced corruption at the Nairobi Water and Sewerage Company, according to a study by the firm.
- **R50-million** – This is what will reportedly be spent by chemical firms Bayer/Lanxess to remove hexavalent chromium that has polluted groundwater in eThekwini's Merebank area.
- **81%** – The percentage of South Africans who have access to safe basic water, according to the Department of Water Affairs & Forestry (DWAF).
- **20** – The number of years before the world's equatorial ice fields will be gone, according to UK scientists.
- **1 800** – The number of leaks repaired in the poorest neighbourhoods of Cape Town following the launch of the metro's leak repair programme last year. This has saved the city more than R1-million over four months.
- **R30-million** – The funds the North West government received from National Treasury for sanitation this financial year.
- **3 500** – The average number of sewer blockages experienced monthly by Johannesburg Water.
- **986** – The estimated number of sewage treatment plants in South Africa
- **37** – The estimated number of settlements believed to be illegally situated on top of Rand Water pipes.
- **4** – The estimated number of years to remove the 300 000 t of contaminated soil at the AECI site near Somerset West. The soil was contaminated while fertilisers and explosives were being manufactured on site. Traces of arsenic and other toxins have also been found in nearby groundwater.
- **R25-million** – DWAF's budgeted support for emerging farmers for the present financial year.

Giant pumps for UK

The KSB Group has supplied SEZ hydraulic systems with drives for six huge concrete volute casing pumps for the St Germans Pumping Station replacement project, in the UK.

The new structure, situated 7 km south of King's Lynn in Cambridgeshire, will replace the 70-year-old like-named pumping station, which reportedly no longer meets modern flood-protection standards.

Each pump will raise some 17 000 ℓ/s to a head of roughly five metres. Their impellers, with a maximum diameter of 2,65 m, will only have to turn at 120 revolutions a minute. Each unit will have a drive rating of 1 250 kW. The new pumps' casings are made of concrete instead of metal.



With a diameter of 2,65 m, the impellers produced for the St Germans Pumping Stations are the largest ever built by KSB.

Back-to-back orders for Biwater

Biwater South Africa undertook a R25,2-million mechanical and electrical contract for Phase Two of the extension of the Potsdam Wastewater Treatment Works, in Cape Town.

Work to upgrade the ageing sewage treatment plant, which was originally constructed in the 1950s, started in 2004. The plant, which serves the Blaauwberg area, has been operating beyond its design capacity.

The Potsdam works in its past configuration comprised two streams, one being treated by a biofilter system and the other through an activated sludge process. Biwater South Africa is responsible for all the mechanical and electrical work on the present extension.

The company reports that the extension project comprised construction of a raw water pump station, a biological reactor complete with ten aerators ranging from 55 kW to 110 kW in size, 12 mixers, recycle pumps, dissolved oxygen measurement and control. There are four clarifiers each with a diameter of 35 m as well as a return activated sludge pump station.

One of the greatest challenges on the project wass the interface with the existing works which needed to stay in operation at all times. This contract is one of at least four Biwater South Africa has received in the last few months. The largest of these is for an 18 Mℓ/day activated sludge plant followed by a membrane bioreactor at the Zandvliet Sewage Treatment Plant. This plant is one of the main installations treating municipal effluent from the City of Cape Town.

Thousands to benefit from groundwater strike

Groundwater might prove the sustainable solution for residents of rural village Lusikisiki, in the Eastern Cape, after a R2-million study by the Department of Water Affairs & Forestry (DWAF) indicated massive underground water reserves in the area.

The Lusikisiki Groundwater Feasibility Study was part of commissioned company SRK Consulting's task which included undertaking exploration work to assess underground water resources in an area stretching from Port St Johns on the east coast to Mkambati on the Msikaba River, and inland as far as Flagstaff. The area is part of the Oliver Tambo District Municipality.

Water Diary

DRY SANITATION
AUGUST 16-19
The Second International Dry Toilet Conference will be held in Tampere, Finland. Themes include, inter alia, historical aspects of dry toilet use; architecture, construction, maintenance and logistics of dry sanitation; and regulatory framework of dry sanitation. *Enquiries: Global Dry Toilet Club of Finland; E-mail:* secretary2006@drytoilet.org*; Visit:* www.drytoilet.org/dt.06.html

WORLD WATER ISSUES
AUGUST 20-26
The Stockholm International Water Institute's (SIWI's) World Water Week will be themed 'Beyond the River – Sharing Benefits and Responsibilities'. The conference will examine the sharing of benefits and responsibilities in particular as they relate to livelihood improvement, land-based activities within a river basin, and society's ability to cope with natural disasters. *Enquiries: SIWI Secretariat, Tel: +46 8 522 139 60; Fax: +46 8 522 139 61; E-mail:* siwi@siwi.org*, Web:* www.worldwaterweek.org *or* www.siwi.org

AGRICULTURAL ENGINEERING
SEPTEMBER 3-7
The World Congress on Agricultural Engineering for a Better World will be held in Bonn, Germany. More than 800 participants from all over the world are expected to share their experiences in science and research, as well as on product developments and practical application of agricultural engineering. *E-mail:* info@2006cigr.org*; Web:* www.2006cigr.org

RIVER MANAGEMENT
SEPTEMBER 4-7
The Ninth International River Symposium focuses on river management and the integration of science, business, institutions and the community in managing the problems facing rivers, waterways and catchments around the world. This year the symposium will particularly explore 'Managing Rivers with Climate Change and Expanding Populations'. It takes place in Brisbane, Australia. *Enquiries: Lynette Maxwell, Tel: +61 (0)7 3846 7444; E-mail:* lynette@riverfestival.com.au*; Visit:* www.riversymposium.com

WASTE MANAGEMENT
SEPTEMBER 5-8
WasteCon 2006, the biennial conference and exhibition hosted by the Institute of Waste Management of Southern Africa (IWMSA) will be held in Somerset West. *Enquiries: Claire McKinnon; Tel: (021) 400-2822; F: (021) 400-4302; E-mail:* wastecon06@netactive.co.za

Modern satellite imagery, known as Landsat Linear Mapping, has been used to highlight geological deformations below the surface, explained SRK Consulting associate Gert Nel. Interpretation of this information on the surface using electro-magnetic and magnetic techniques helped define 24 drilling targets around prominent satellite lineaments associated with dolerite intrusions. After 18 exploration holes had been drilled, one provided an airlift yield of 85 ℓ/s, and two each of 22 ℓ/s.

"These groundwater reserves could provide up to 50 000 people in the area with at least a basic supply of potable water."

The former borehole was drilled in the fractured sandstone of the Msikaba Formation by Cilliers Drilling, and was tested by AB Pumps, both Eastern Cape contractors. Subsequent tests have shown that the borehole is capable of providing a sustainable delivery of 11 ℓ/s of good quality water.

"The finds have been exceptional and the present objective is to find an underground water reserve source fairly close to the existing water supply infrastructure serving Lusikisiki and neighbouring areas," commented Alan Brown, DWAF chief engineer: options analysis for the Southern Cape. These groundwater reserves could provide up to 50 000 people in the area with at least a basic supply of potable water."

Cost-recovery system for villages

Consulting engineering firm African EPA has successfully implemented a pilot cost recovery scheme in Aganang, in Limpopo.

According to African EPA's Onno Fortuin, while the project brief appeared simple enough at first perusal – the installation of water meters and ancillary works in four communities within the Aganang municipality – the overall success of the project would be measured against the successful implementation of a cost-recovery system in the villages.

Investigations revealed that the people of Aganang were overwhelmingly in favour of paying for a higher level of supply on the condition that the bulk supply was reliable. The four communities obtained water from the same source – the Hout River Regional Water Supply Scheme. It was decided to include three additional villages, which were also linked to this scheme, in the cost-recovery programme.

A comprehensive social facilitation process was implemented and contributed greatly towards the overall success of the project, said Fortuin. One village within the supply area was identified as a pilot project. The water supply to the village had to be assured from a nearby reservoir.

A new water committee was established within the community and provided with the necessary training. A household register was also compiled and thereafter training focused on a workable cost-recovery system that could be implemented in the pilot village.

After having the different options explained to them, community members were given the option of choosing the type of yard connection they preferred. The cost-recovery system will be tested within the pilot village and then be implemented progressively in the remaining villages of the Aganang supply scheme.

Cost recovery has been successfully piloted in Aganang, Limpopo.

Water on the Web

www.asiawaterwire.org
This is a regular news resource on a diverse range of water issues. Many of the articles are the product of reporting on the ground by local journalists.

www.gemstat.org
GEMStat is a global water online database which was launched in 2005 to strengthen the scientific basis for global and regional water assessments, indicators and early warning. It is designed to share surface and groundwater quality data sets from the GEMS/Water Global Network, including over 1 400 stations, two million records and over 100 parameters. Between March and December 2005, 4 319 visitors from around the world access the database.

www.hip.watsan.net
The Hygiene Improvement Project (HIP) is a five-year project, funded by USAID to improve hygiene practices in about five countries. The website aims to facilitate people working in hygiene improvement to cultivate a culture of knowledge sharing and to serve as a resource for country hygiene networks.

www.iclei.org
ICLEI was founded in 1990 as the International Council for Local Environmental Initiatives. The council was established when more than 200 local governments from 43 countries convened at the inaugural conference, at the United Nations in New York. The organisation provides technical consulting, training and information services to build capacity, share knowledge and support local government in the implementation of sustainable development at the local level.

www.negowat.org
The Negotiating Peri-urban Water Conflicts (NEGOWAT) project (2003-2006) is a multi-partner research project financed by the European Union, DFID of the UK and ASPA of Brazil. In Chennai, India; Sao Paulo, Brazil; and Cochabamba, Bolivia; the project focuses on developing tools to better understand water-related competition and conflicts.

Tsunami effects still felt in Sri Lanka

The effects of the 2004 tsunami will long still be felt in south-Asian countries such as Sri Lanka, where groundwater supplies are badly contaminated by salt, reports water resource scientists.

The scientists, hailing from Sri Lanka, Denmark, and the US, surveyed the coastal groundwater resources of Sri Lanka to develop an understanding of the impacts of the tsunami and to provide recommendations for the future of coastal water resources in south Asia. They found that in Sri Lanka alone, an estimated 40 000 drinking water wells were either destroyed or contaminated. Seawater filled domestic open dug wells and also entered the aquifers via direct infiltration during the first flooding waves and later as ponded seawater infiltrated through the permeable sands that are typical of coastal aquifers.

Widespread pumping of wells to remove seawater was effective in some areas, but overpumping has led to upcoming of the saltwater interface and rising salinity. It is estimated that groundwater recharge from several monsoon seasons will reduce salinity of many sandy Sri Lankan coastal aquifers.

However, the continued sustainability of these small and fragile aquifers for potable water will be difficult because of the rapid growth of human activities that results in more intensive groundwater pumping and increased pollution.

- To access the full report published by the American Geophysical Union, go to http://www.agu.org/pubs/crossref/2006.../2006WR004876.shtml

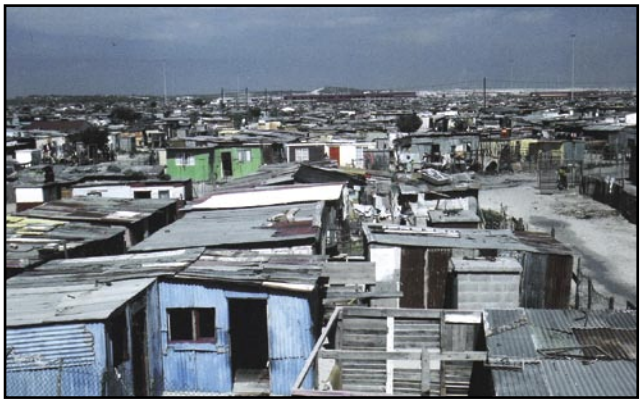
Africa holds record for city growth

Sub-Saharan Africa has the highest informal settlement and urban growth rate, according to a new report released by UN-Habitat.

Africa's informal settlements grow by 4,53% a year, nearly twice that of Southern Asia. In turn, the urban growth rate is 4,58% a year, according to the *State of the World's Cities Report 2006/07*.

In 2007, for the first time in world history, the world's urban populations will exceed the rural population. Unfortunately, many city dwellers end up in informal settlements where they, more often than not, are exposed to extreme poverty and disease without proper access to basic services. In sub-Saharan Africa, for example, the so-called slum population accounts for more than 70% of the urban population.

In fact, the UN-Habitat report shows that slum dwellers are as badly if not worse off than their rural cousins in terms of health, literacy and prosperity, contradicting general assumptions. The world's one billion slum dwellers are more likely to die earlier, experience more hunger and disease, attain less education and have fewer chances of employment than those urban residents that do not reside in an informal settlement.



- To access the report, go to www.unhabitat.org

Satellites to reveal mystery of the clouds

US space agency NASA has launched two research satellites to help scientists refine computer models that forecast the weather and chart global climate change.

The satellites, dubbed CloudSat and CALIPSO, will provide a new three-dimensional perspective on Earth's clouds and airborne particles (aerosols). The satellites answer questions about how clouds and aerosols form, evolve and affect water supply, climate, weather and air quality.

NASA reports that CloudSat's cloud-profiling radar is more than 1 000 times more sensitive than a typical weather radar. It can detect clouds and distinguish between cloud particles and precipitation. Although only about 1% of Earth's water is held in clouds, it plays a crucial role in the planet's weather.

In turn, CALIPSO's polarisation lidar instrument can detect aerosol particles and can distinguish between aerosol and cloud particles.

- **To follow the progress of the two satellites, visit www.nasa.gov/cloudsat**

Water Franchise Pilot on the Cards

South Africa could see the implementation of a franchising pilot project in the future following an announcement by the Water Research Commission (WRC) that it is continuing research into the application of this business model in the water services sector.

According to Jay Bhagwan, Director: Water Use and Waste Management at the WRC, initial research into franchising as an institutional option for water services operation and management, published in 2005, found that the franchising concept and its success in the commercial sector showed many characteristics which could alleviate problems encountered in municipal water services delivery. At the same time, franchising would have the added advantages of stimulating and supporting small business and black economic empowerment activities. Bhagwan was speaking at the Biennial Conference of the Water Institute of Southern Africa, held in Durban earlier this year.

"In the rural areas, where a few water services authorities can afford to employ sufficiently qualified staff of their own, it would be a significant advantage to have this level of expertise available."

It is believed that franchisee water services providers would have a better incentive to perform than, for example, in-house water services authority personnel would usually have, while enjoying the benefit of the franchisor's expert guidance and quality assurance. In turn, since the costs are spread over a network of franchisees, the franchisor will be able to provide resources normally only available to larger water services providers. "In the rural areas, where a few water services authorities can afford to employ sufficiently qualified staff of their own, it would be a significant advantage to have this level of expertise available," said Bhagwan.

At present, there is little experience of water services franchising anywhere in the world, and none in South Africa. However, as the challenge grows for water services providers to provide sustainable services the concept of franchising is sparking international interest. A recent World Bank discussion paper suggested that franchising shows great promise, especially in respect of water services to small towns and to multi-village schemes.

As Bhagwan pointed out, "there is a need for alternative institutional models and concepts that are more suited to sustaining ongoing operation of water services and that are friendly to small and micro businesses, rather than for large service arragements."

The new WRC funded study, being undertaken jointly by CSIR, Amanz'abantu Services and Viva Metsi, is aimed at reviewing statutory, procurement and other issues which could impact on water services franchising. It will also identify elements in the water services delivery chain which offer the greatest scope for franchising. Pilot projects will be initiated to test the business concept in the South African water services sector. Ultimately, it is hoped to establish different franchise models for the sector with guidelines for setting up of water franchising.

Bhagwan was quick to note that, despite its potential, franchising would be by no means free of many of the issues that equally affect other water services delivery alternatives. It is another institutional option, rather than the ultimate solution. "Franchising would be just as dependent on the criteria for sustainable operations being in place, and just as dependent as current delivery institutions are on any external sources of finance."

WHAT IS FRANCHISING?

Franchising is a way of using tried and tested methods to accelerate the development of a business. The right is granted by a business entity (the franchisor) to a smaller entity (the franchisee) to use a business method or system. In return, the smaller entity pays fees to the larger. The assistance that the franchisor gives with setting up the franchisee's business, as well as ongoing training of the franchisee and quality control of the goods and services are usually also part of the business deal.

- To order the initial WRC report on franchising (**Report No KV 161/05**), contact Publications at Tel: (012) 330-0340 or E-mail: orders@wrc.org.za

Franchising of commercial goods and services is growing rapidly in South Africa. Nearly 400 franchised systems currently operate through more than 26 000 franchising outlets in the country.