

Groundwater guidelines available online



The Department of Water Affairs & Forestry's (DWAf's) *Guideline for the Assessment, Planning and Management of Groundwater Resources* in South Africa is now available online.

Many communities in South Africa rely on groundwater aquifers as their main or only source of water. While groundwater resources are increasingly being assessed and developed standard procedures have been lacking.

This prompted DWAf to develop the guideline that can be followed and adhered to when undertaking assessment, planning and management of groundwater resources in the country. It is anticipated that the guideline will lead to the sustainable development,

protection and management of South Africa's groundwater resources, and will assist in achieving the overall goal of integrated water resource management within the department.

The guideline is presented in three chapters. The first chapter provides a conceptual overview

in terms of the purpose of the guideline, the location of groundwater resources, the regulatory framework, principles and approaches, as well as institutional arrangements.

Chapter two provides details of the process and related activities that should be followed during the assessment, planning and management functions. Lastly, chapter three provides detailed procedures, in the form of checklists with guiding notes, for carrying out the assessment, planning and management functions.

To access the document, go to <http://www.dwaf.gov.za/Documents/Other/Water%20Resources/GroundwaterPlanGuide-Mar08.asp>

Water sector has work to do

While the South African water sector is on the right track it still has much work to do to ensure access to safe water for all in light of deteriorating water resources. This is according to newly-inaugurated President of the Water Institute of Southern Africa (WISA), Dr Heidi Snyman.

"The 2007 *State of Environment* Report states that a significant proportion of our usable water resources have been degraded and that most of our exploitable water resources are being utilised at present. The restriction on the fitness-for-use imposed by the water quality standards of the different water management areas regarding domestic, irrigation, and recreation use are significant due to increased pressures.

"If we as a sector take the concept of Water for Growth and Development and

Integrated Water Resource Management (IWRM) seriously, we need to remind ourselves from time to time what the consequences are when we fail to meet our objectives," noted Dr Snyman. These consequences include the outbreak of waterborne diseases which particularly affect the poor, increased salinity, eutrophication and suspended solids as well as increased levels of contaminants, acidification and the unacceptable impact of solid waste.

Dr Snyman said that water professionals, through WISA, could contribute much more to addressing the challenges faced by the South African water sector. "WISA should give more attention to cross-cutting issues, such as IWRM that extend over several sectors. We can increase involvement with the agricultural sector, for example."

Government wants more engineers

As part of government's Joint Initiative for Priority Skills Acquisition (JIPSA), a target of producing 2 500 engineers a year has been set to help the country deal with skills shortages.

"JIPSA has targeted a limited number of priority skills thought to be some of the key constraints to economic growth," noted chief economist within the Presidency, Alan Hirsch. "The key to growth is infrastructure – roads, electricity, water and housing – and for that we need engineers."

Government has committed R439-million for the period 2007 to 2009 to improve teaching and learning infrastructure in South Africa.

Public invited to be water heros

WWF South Africa has launched its new 'Be the Hero' campaign, which invites individual South Africans to make a real difference in the state of our environment.

"There is a sense among people that environmental degradation is completely out of their hands, but this is simply not true," reports WWF South Africa CEO Dr Morné du Plessis. "There are basic steps that South Africans can take that will not only reduce our ecological footprint as a nation, but also save us money." The campaign particularly targets the middle to higher income groups, which are responsible for most of the country's water and electricity use.

Dr Du Plessis emphasises that consumers today are spoilt for choice and no longer have to accept whatever product they can get without knowing the background. "Today consumers increasingly have access to information about their product choices, and it is therefore our responsibility as individuals to make use of these resources."

The campaign is centred around a website (www.wwf.org.za/hero) which features information on topics such as water, waste, energy and food. Other sections include advice on greening one's home as well as a downloadable pocket size shopping guide, a green products and services directory and a directory of recycling service providers.

The website also acts as a forum for information sharing, as a blog is created for everyone who signs up. "If people were aware of simple facts such as that leaving the tap running while brushing teeth wastes nine litres of water a minute they would think twice before doing so," maintains Dr Du Plessis. If enough South Africans make these changes, the nett effect will be significant. In the case of the brushing teeth example, a million people turning the tap off while they brushed their teeth twice a day would save 18 million litres of water daily.

New steering committee to drive wetland rescue

A steering committee has been formed to drive the restoration process of the Klip River wetland, south of Johannesburg.

The committee includes representatives of the Department of Water Affairs & Forestry, Gauteng Department of Agriculture, Conservation & Environment, City of Johannesburg, Rand Water and the South African National Biodiversity Institute.

The wetland plays an extremely valuable role as it treats the polluted waters arising from the western section of the Witwatersrand urban-industrial-mining complex. However, increased inflows of water, mainly treated effluent from surrounding wastewater treatment works are threatening the future of the wetland (for more information, see the article on p23 of *Water Wheel* March/April 2008).

Source: *Working for Wetlands*

WATER DIARY 1

SANITATION

SEPTEMBER 24-26

An international conference on sustainable sanitation will be held in Ouagadougou, Burkina Faso. Visit: www.netssaf.net/170.0.html

TRANSBOUNDARY WATER

OCTOBER 15-18

The 4th International Symposium on Transboundary Water Management will take place in Thessaloniki, Greece. Visit: www.inweb.gr/twm4

Water Minister puts her foot down

The Department of Water Affairs & Forestry (DWAF) is to take stronger action against municipalities who continue to put the health of their communities and the environment at risk through sub-standard water and wastewater treatment and supply.

This is according to Minister of Water Affairs & Forestry Lindiwe Hendricks. She was delivering her budget vote in Parliament in May.

In the past DWAF has been criticised for not taking more severe action against municipalities delivering sub-standard quality drinking water or whose non maintenance of wastewater treatment works has led to raw sewage leaking into the environment. Department officials had always cited government's policy of 'cooperative governance' as the reason for not taking these municipalities to court, even though it is authorised by law to do so. But, according to Hendricks the days of playing 'buddy-buddy' with non-compliant local authorities are over.

She noted that court action could be a lengthy process, leaving municipalities at risk. As a result, her department was looking at other means of remedying the situation. "Despite DWAF support it has become apparent that there are municipalities that clearly cannot perform their functions, and

my department is working with the Department of Provincial and Local Government to re-examine the powers and functions allocated to such municipalities," announced

Hendricks. She said that letters had already been sent to municipalities whose water quality did not meet national standards, giving them 30 days to come up with plan of action to address the situation.

"We are now looking at the legislative and regulatory framework to identify the means of taking over their water quality management function, and where water boards can be used to perform some of these functions in the event that municipalities are found wanting."

DWAF was also collaborating with the Department of Environmental Affairs & Tourism to strengthen its ability to fight environmental and water crimes. The minister said the Green Scorpions might be used in future to investigate alleged water crimes, including illegal water use and pollution.

"I will not tolerate any activities which may in any way compromise our water security in terms of both quality and quantity. DWAF is planning a zero tolerance campaign later this year."



Department to boost technological innovations

The Department of Science & Technology is to create a Technology Innovation Agency (TIA) before the end of the year. Delivering his budget speech in Parliament in May, Minister of Science & Technology Mosibudi Mangena said this agency would be designed to provide financial assistance to individuals or parties to enable them to develop and commercialise their technical innovations and inventions. "The agency will draw together and integrate the management of disparate technological innovation initiatives that are still at an early development stage."

It is also expected that the TIA will

become a custodian of the Centres of Competence. "These centres arise from the need to actively promote greater collaboration between and among the academia, industry, research councils, entrepreneurs or technopreneurs, international research organisations, and individual inventors and innovators, such that this collaborative effort produces socio-economic benefits for the country," noted Mangena. "The Centres of Competence complement the Centres of Excellence we launched in 2004, which are focused mainly on basic research, knowledge production and publications."



SA Tourism

Groundwater has the potential to supply as much as 20% of Port Elizabeth's present water requirements, a recently published study has found.

A study into potential high-yielding aquifers around the Nelson Mandela Bay Municipality indicates that groundwater could potentially be exploited to augment the area's future bulk water supply. The municipal area's water requirements are estimated to increase from the present use of nearly 100 million m³/annum to about 130 million m³/annum by the year 2017, mostly as a result of the developments around the new Coega harbour and industrial development zone.

Traditionally, groundwater resources for municipal supplies are only assessed within a relatively small radius of cities or towns because of logistical and economical factors associated with pumping large distances. In the past groundwater was largely written off as a potential bulk water supply source to the city of Port Elizabeth and surrounds because previous assessments focused on a relatively small area in and around the city.

The latest study, supported by the municipality, the Water Research

Commission, and the Department of Water Affairs & Forestry (DWAFF), presents major aquifers and potential drilling target areas within an economically acceptable distance of existing water supply infrastructure. As the authors explain, the study applied the concept of an 'economic radius' rather than a 'physical radius' from the point of need.

"While this study focuses on the Nelson Mandela Bay Municipality, the concept of an economic radius should be applied to all municipalities – particularly those where existing bulk supply infrastructure stretches hundreds of kilometres from the town or city," write Ricky Murray of Groundwater Africa, Marc Goedhart of the Council for Geoscience and Jane Baron of DWAFF. "The study aims to show that groundwater resources can be considered far from the point of use, so long

as the area is within an acceptable distance from existing water supply infrastructure."

Prime groundwater development areas were identified and grouped into five hydrogeological domains. Within each of the domains specific groundwater exploration targets were identified and prioritised. Much of the information was based on previous work done for DWAFF's Groundwater Resource Assessment Phase II project and no ground-truthing was done to verify the target areas.

"The purpose of this exercise was to provide a first-order estimate of the groundwater potential, and it should serve as a good starting point," the authors explain. "It is likely that some of the areas may be unsuitable for groundwater development for a variety of reasons, and that a number of other areas could also be developed for large-scale groundwater supply."

The study indicates that groundwater resources in the areas identified, if well developed, could yield about 30 million m³/annum. With use and scientific monitoring, it would be possible to establish whether the upper estimates of 40 to 50 million m³/annum could be attained on a sustainable basis. Present groundwater use is coarsely estimated to be about 9 million m³/annum, which leaves about 20 million m³/annum available for future development. More in-depth studies have been recommended.

To order the report based on the study (**Report No: TT 327/08**) contact Publications at Tel: (012) 330-0340 or E-mail: orders@wrc.org.za

Table: Total groundwater potential in all five hydrogeological domains

Groundwater Exploitation Potential (normal years)	48 Mm ³ /a
Groundwater Exploitation Potential (dry years)	32 Mm ³ /a
Borehole yield without artificial recharge and continuous abstraction	28 Mm ³ /a
Borehole yield with artificial recharge and 6 month/a abstraction	41 Mm ³ /a
Existing use	9 Mm ³ /a

WATER DIARY 2

WASTE MANAGEMENT OCTOBER 6-10

The 19th annual Waste Management Conference & Exhibition will take place at the Durban International Convention Centre. The theme is 'Minimising Waste and its Effects

on Society'. Enquiries: Ms Nina Freyssen-Pretorius or Belinda du Preez;
Tel: (031) 303-9852; E-mail: nina@confco.co.za or Belinda@confco.co.za;
Visit: www.wastecon2008.co.za

GROUNDWATER OCTOBER 26-NOVEMBER 1

International Association of Hydrogeologists 2008 Conference with the theme 'Integrating Groundwater Science and Human Well-Being', will take place in Toyama, Japan.
Visit: www.iah2008.jp

New from the WRC

Report No: TT 328/08

Community-based Governance of Freshwater Resources in Southern Africa (S Pollard and T Cousins)

This research seeks to address issues regarding natural resource governance arising from field work in communal wetlands in the Sand River catchment of the north-eastern region of South Africa. Here the emerging confusion over changing roles and responsibilities for natural resources echoes wider concerns over land and natural resource tenure in communal areas. Despite the best intentions of policy reforms there appeared to be a 'muddying of the policy waters' with various actors claiming authority over the control and management of natural resources. Work in the Sand River catchment has highlighted that natural resources are generally managed according to locally-derived rules and norms, or a blend of local and statutory systems. The report concludes that locally-based systems are part of our constitutional landscape. Legal pluralism is a reality, and thus a more constructive approach to the apparent dilemma of legal pluralism is needed.

Report No 1476/1/08

Hydroclimatic variation over Southern Africa at Intra-annual and Inter-annual Time Scales with Special Reference to the Role of the Oceans (M Rouault; CJR Reason; N Vigaud; A Mavume and N Fauchereau)

Over the last century, South Africa has suffered from dramatic inter-annual changes in rainfall, characterised by severe droughts and wet spells. There is a need to enable resource managers (water and agriculture) to optimally exploit the best current climatological knowledge in dealing with hydroclimatic variability, thereby enhancing their decision-making ability for the short, medium and long term. This project set out to enhance the understanding of hydroclimatic variability in southern Africa with special reference to the role of the oceans and thereby address some of the needs of resource managers in this connection. Among others the project aimed

to assess the suitability of indices used to represent hydroclimatic variation over southern Africa from a joint ocean/atmosphere system and water resource management perspective; and to select, assess and apply the most promising of advanced remote sensing and modelling products.

Report No 1611/1/08

A Survey of Information Exchange between Water Services Information Providers and Water Services Authorities/Local Government in South Africa (JP Pansegrouw and P Naidoo)

Water services information providers (including Water Research Commission, Department of Water Affairs & Forestry, CSIR, and Development Bank of Southern Africa among others) are responsible for the provision of relevant water services information to the various water services authorities (WSAs) and local government structures across the country. The study investigated the information exchange between these information providers and WSAs or local government bodies involved in the provision of water services in South Africa. It included a literature review, interviews with key stakeholders, surveys and case studies aimed at verifying the communication channels used in the water services sector. Among others the study found that more collaboration is required between water services information providers to avoid duplication, and stressed the importance of identifying the target audience clearly as well as the timing of dissemination or information exchange.

Report No: TT 347/08

Enabling Water Fluoridation on Small Drinking Water Treatment Plants (R Rajagopaul; P Thompson and A Hariram)

The project aimed to enable fluoridation to be done safely on small water treatment plants by means of the evaluation, selection and implementation of safe handling and dosing equipment and monitoring instrumentation.

The outcome of the research indicated that the use of equipment that would ensure safety of handling and exposure to operations personnel and safety to the consumer by maintaining an acceptable fluoride dose in the drinking water is the main priority. A Web-based fluoridation user guide has been set up to provide online fluoridation information.

Report No: 1307/1/08

The Impacts of High Winter Flow Releases from an Impoundment on In-stream Ecological Processes (C Dickens; M Graham; G de Winnaar; K Hodgson; F Tiba; R Sekwele; S Sikhakhane; F de Moor; H Barber-James and K van Niekerk)

The Albert Falls Dam on the uMngeni River, in KwaZulu-Natal, provides an ideal system in which to test the impacts of downstream water releases on the river ecosystem. The particular system releases high flow volumes during the winter dry season and lower volumes during the summer wet season, thus exhibiting a reserved hydrograph situation. This project firstly set out to document the potential causes of downstream ecological stress, in particular the flow volumes and the quality of the water released from the dam. Following this was an investigation into the signs of stress that were being exhibited by the ecosystem. Investigation of the riparian vegetation, the fish and the invertebrates all revealed that while there were significant changes induced by the dam, these were rapidly ameliorated with distance downstream, probably due to the ingress of tributary water and the processes of purification that remove toxic substances from the water. The central conclusion of this project is that, while the quality and quantity of water released from the dam does not pose any obvious threat to the downstream river environment at a distance beyond a few kilometres, there are significant changes to the ecosystem, including its biodiversity.



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Whisky used to clean polluted lands



Scientists have unveiled the latest weapon in the battle to clean up polluted groundwater at contaminated land site – whisky. A natural byproduct from the preparation of Scotland's national drink is reportedly being used to clean contaminated groundwater and wastewater in a pioneering technique, developed by scientists at Aberdeen University. Known as Dram (device for remediation and attenuation of multiple pollutants) the technology is said to be cheaper and easier to deploy than standard treatments, and has the potential to cut the UK's estimated annual spend on land remediation of £1,2-billion. The passive system involves inserting the organic material from whisky processing into the ground to attract solvents, which it breaks down. No intervention is required to apply it to contaminated sites as it can use existing infrastructure.

Harmful algae take advantage of global warming

The weather extremes accompanying global warming are enhancing the growth of cyanobacteria, according to a paper published in the April 4 issue of the journal *Science*.

Toxic algal blooms are found in key bodies of water across the world, and cost many million of Rands to treat. "It has long been known that nutrient runoff contributes to cyanobacterial growth. Now scientists can factor in temperature and global warming,"



said Prof Hans Pearl of the University of North Carolina who co-wrote the paper along with Prof Jef Huisman of the University of Amsterdam. "As temperatures rise waters are more amenable to blooms."

Warmer weather has created longer growing seasons, and it has enabled cyanobacteria to grow in northern waters previously too cold for their survival. Species first found in southern Europe in the 1930s now form blooms in northern Germany, and a Florida species now grows in the southeastern US. Others have appeared recently in places as far north as Canada.

Fish and other aquatic animals and plants stand little chance against cyanobacteria. The algae crowd the surface water, shading out plants – fish food- below. The fish generally avoid cyanobacteria, so they are left without food. And when the algae die they sink to the bottom where their decomposition can lead to extensive depletion of oxygen.

UN to assist African farmers

Some 10 000 farmers in five African countries, where crops are expected to be badly affected by climate change, are to receive help from the United Nations Meteorological Organisation (WMO) in the form of low-cost rain gauge equipment and roving seminars provided by agricultural experts.

With the help of Spain, WMO will distribute the rain gauges to volunteer farmers in Burkina Faso, Mali, Mauritania, Niger and Senegal, and train them in using rainfall data to plan sowing, fertiliser application and harvesting. The goal of the roving seminars is to support farmers' self-reliance by supplying them with information on weather and climate risk management.

In West Africa, the area suitable for agriculture, the length of the growing season, and crop yields, especially along the margins of

arid and semi-arid areas, are all expected to decrease, according to projections by the UN Intergovernmental Panel on Climate Change. In some African countries, yield from rainfed farming could be reduced by up to 50% by 2020.

Biodiversity – it's in the flow of the water

A team of international researchers have invented a method for turning simple data about rainfall and river networks into accurate assessments of fish biodiversity, allowing better prediction of the effects of climate change and the ecological impact of man-made structures, such as dams.

The mathematics behind the new method can also be used to model and predict a range of other questions, from the transmission of waterborne illnesses to vegetation patterns on land adjacent to rivers. The researchers, who published a report in the May 8 issue of *Nature*, have created a computer simulation that allows them to predict, based on rainfall measurements and the structure of river networks, how many species of fish will occupy any given region.

"It is an extremely simple model, but it predicts well all of the characteristics of biodiversity that we were interested in," commented Prof Ignacio Rodríguez-Iturbe of the Department of Civil and Environmental Engineering at the University of Princeton, who lead the study. "Our model implies that water dynamics have a commanding effect on biodiversity in river basins."

For more information, go to www.princeton.edu/main/news/archive/S21/00/89G47/



Groundwater recharge system wins international award



The world's largest water purification plant for groundwater recharge will be awarded the prestigious Stockholm Industry Water Award during the 2008 World Water Week in Stockholm in August.

The Groundwater Replenishment System (GRS), situated in California, in the US, was developed through the Orange County Sanitation District with the Orange County Water District. It will provide enough water to meet the needs of an additional 50 000 people without diminishing groundwater resources for present of future generations.

The system diverts treated sewer water that is currently discharged into the ocean and purifies it through a series of advanced

techniques including microfiltration, reverse osmosis, ultraviolet disinfection and hydrogen peroxide. The cleaned water is returned to the groundwater basin to increase both water supply and quality.

"Both agencies have demonstrated how communities can develop, implement and achieve sustainable water reuse," said Lars Gunnarson, chair of the Award Committee. "Their extensive involvement of private companies, long-term commitment to research and development, and utilisation of cutting-edge technologies has established a model for water-stressed regions to replenish groundwater resources and improve water security."

WATER ON THE WEB

<http://groups.google.com/group/Wat-SanIEC/web>

This is a collection of water and sanitation information, education and communication materials on water and sanitation from emergency response and development efforts throughout the world.

www.wrc.org.za/publications_education.htm

The Water Research Commission provides fact sheets on more than 20 different water-related topics, from alien plants, to groundwater and wetlands, to water scarcity and water cultures. The organisation's popular Career Guide, aimed at high school learners, is also available online. Lastly, a series of Lesson Plans on Water for Grade R to Grade 10 is available. The lesson plans were developed in collaboration with ShareNet.

www.connect2earth.org

A new online community for young people has been launched on the Web. Hosted by IUCN, WWF and Nokia, the website offers young people (under the age of 35) the opportunity to share their ideas about environmental issues and solutions. People can contribute by uploading their own videos, images and texts.

www.drinking-water-engineering-and-science.net

Anyone can read the articles on the new Drinking Water Engineering and Science journal for free – it is the author who pays for publication (about €400 for ten pages). Articles are subject to the usual peer review procedure of assessment by three referees. If an article is not published, it will be placed on the discussion section of the site so that it is still available to all.

WATER BY NUMBERS

- **91** – The number of clinics that had no access to basic water and sanitation which have now been supplied, according to the Department of Water Affairs & Forestry (DWAF).
- **20 000** – The targeted number of new water management devices the City of Cape Town hopes to install by mid-2009. The water management device is programmed to dispense a pre-agreed volume of water each day. This encourages consumers to analyse and monitor water usage and to avoid unnecessary wastage.
- **R6,69-billion** – The total budget for DWAF for 2008/2009.
- **19** – The number of megacities with more than ten million inhabitants, according to the United Nations. For the first time in history, the number of people living in cities this year out-ranks the number living in rural areas.
- **R415-million** – The funds budgeted by DWAF for the rehabilitation of bulk infrastructure for the present financial year.
- **1 831** – The number of interactions on transboundary basins (both conflictual and cooperative) over the last 50 years, according to UNESCO. A total of 7 conflicts have involved violence, and 507 conflictive events have occurred while about 200 treaties have been signed, with a total of 1 228 cooperative events.
- **€12-billion** – The sales generated in 2007 by Suez Environment, the environment arm of French utility group Suez. The unit reportedly makes 80% of its revenues in Europe and is the second biggest water player after Veolia.
- **222** – The number of informal settlements around the City of Cape Town, according to Mayor Helen Zille.
- **R872-million** – The monies allocated from Johannesburg City's budget to Johannesburg Water towards upgrading of the city's sewer networks and bulk wastewater infrastructure.
- **51** – The number of schools country-wide which have no basic sanitation.

Saving Water from 'Field to Fork'

The Stockholm International Water Institute (SIWI), the Food and Agriculture Organisation of the United Nations (FAO) and the International Water Management Institute (IWMI) have called on governments to reduce by half, by 2025, the amount of food that is wasted after it is grown.

The organisations have released a report, *Saving Water: From Field to Fork – Curbing Losses and Wastage in the Food Chain*, outlining concrete steps to achieve a 50% wasted food reduction.

LIKE LEAVING THE TAP RUNNING

Tremendous quantities of food are discarded in processing, transport, supermarkets and people's kitchens. This wasted food is also wasted water. In the US, for instance, as much as 30% of food, worth some US\$48,3-billion, is thrown away each year. This is like leaving the tap running and pouring 40 trillion litres of water into the garbage can – enough water to meet the household needs of 500 million people.

More than enough food is produced to feed a healthy global population. Distribution and access to food is a problem – many go hungry, while others over-eat. The report highlights an often overlooked problem: we are providing food to take care of not only our necessary consumption but also our wasteful habits.

"As much as half of the water used to grow food globally may be lost or wasted," says Dr David Molden, Director of Research at IWMI. "Curbing these losses and improving water productivity provides win-win opportunities for farmers, business,



www.sci.hk

ecosystems, and the global hungry. An effective water-saving strategy will first require the reducing food wastage is placed firmly on the political agenda."

Food production is constrained by the availability of water and land resources. An estimated 1,2-billion people already live in areas where there is not enough water to meet demand. And with rising demand for water-intensive agricultural products, such as beef and bioenergy, pressure mounts.

According to the Comprehensive Assessment of Water Management in Agriculture 2007, these trends will lead to crises in many parts of the world, particularly South Asia and sub-Saharan Africa. "Unless we change our practices, water will be a key constraint to food production in the future," noted Dr Pasquale Steduto of FAO.

SAVING WATER

Water losses accumulate as food is wasted before and after it reaches the consumer. In poorer countries, a majority of uneaten food is lost before it has a chance to be consumed. Depending on the crop, an estimated 15% to 35% of food may be lost in the field. Another 10% to 15% is discarded during processing, transport and storage.

In richer countries, production is more efficient but waste is greater: people toss the food they buy and all the resources used to grow, ship and produce the food along with it.

The report stresses that the magnitude of present food losses presents both challenges and opportunities. "Improving water productivity and reducing the quantity of food that is wasted can enable us to provide a better diet for the poor and enough food for growing populations," said Prof Jan Lundqvist of SIWI. "Reaching the target we propose, a 50% reduction of losses and wastage in the production and consumption chain, is a necessary and achievable goal."

The report outlines a number of attainable steps, such as supporting farmers with improved harvesting and food storage facilities; benchmarking standards for businesses to reduce waste in processing and transport; and educating consumers on the impacts of over-eating and food waste on water resources.

To access the report, go to www.siw.org/documents/Resources/Policy_Briefs/Paper_13_Field_to_Fork.pdf

WATER DIARY 3

WETLANDS OCTOBER 28-31

The 2008 Wetlands Indaba will be held in the Skukuza Camp of the Kruger National Park. The theme is 'Healthy Wetlands, Healthy People'. Enquiries: Gavin Cowden, Tel: (013) 766-6062; E-mail: gcowden@mpg.co.za; Visit: <http://wetlands.sanbi.org>

WATER FOR GROWTH & DEVELOPMENT OCTOBER 29-31

The Ninth WaterNet/WARFSA/GWP-SA Symposium will take place in Johannesburg in association with the International Commission on Water Resources Systems. The theme is 'Water and Sustainable

Development for Improved Livelihoods'. The symposium promotes interaction among policymakers, academics, and practitioners. E-mail: symposium09@waternetonline.org or Visit: www.waternetonline.org

Unsafe toilets making AIDS patients sick

The dilapidated and unhealthy state of many of the sanitation facilities in communities in peri-urban and rural South Africa is posing a health risk especially to those people suffering from deficient immune systems as a result of HIV/AIDS.

This is one of the main findings of an eight-month study funded by the World Health Organisation and the Water Research Commission in which several communities around the country were surveyed to provide insight into the extent to which water, sanitation and hygiene issues and practices are important and relevant for AIDS patients and their care-givers.

With regards to sanitation, the study looked at the presence of toilets, their accessibility (distance from homestead), and



sanitation and hygiene practices. While most of the households surveyed had toilets, many of these were self-built pit latrines in very poor condition, with some in near state of collapse.

Distances of the toilets from the homestead ranged from 15 m to 40 m. This made them very difficult to be reached by weak patients, who had to battle the elements to reach them. In addition, many of the toilet entrances were very narrow, making it near impossible for care-givers to assist their patients.

Only 60% of the study households who had toilets said that they cleaned them regularly. The dirty toilets pose a health hazard especially to those suffering

from HIV/AIDS, and many communities reported regular outbreaks of diarrhoea.

For a copy of the report (**Report No: KV 290/08**) contact Publications at Tel: (012) 330-0340 or E-mail: orders@wrc.org.za

Minister shocked at state of FS towns' wastewater treatment

Minister of Water Affairs & Forestry Lindiwe Hendricks has expressed her shock and outrage at the state of wastewater treatment at Matjhabeng Local Municipality in the Free State.

The minister visited the municipality, which comprises the towns of Welkom, Odendaalsrus, Virginia, Henneman, Allandridge and Ventersburg as part of National Sanitation Week, held during the last week of May. Poor sewage management has seen the discharge of raw sewage into pans in the municipal area for a number of years. At present, two of the municipality's largest wastewater treatment plants located at Welkom and Odendaalsrus are out of order and overflowing. The municipality is one of a number of local authorities in the Free State where the bucket system has historically been used.

According to Hendricks, her department did summons the municipality in October last year, but never got a response.

She gave Matjhabeng 30 days to come up with an action plan on how they were going to tackle their sewage problem.

One of the challenges plaguing the municipality is its lack of technical personnel. There is reportedly not a single engineer employed at the municipality.

Bucket eradication projects already crumbling

Municipalities must find ways of ensuring their sanitation projects are sustainable. This was the message from Minister of Water Affairs & Forestry Lindiwe Hendricks at the launch of National Sanitation Week at the Sandton Convention Centre on 26 May.

"There have been too many instances where infrastructure has been inappropriate and unsustainable due to the lack of a holistic approach in delivering these services," she said. The minister particularly expressed her concern with some of the projects implemented under the bucket eradication programme where there is already evidence of operation and

maintenance challenges caused by poor implementation practices.

Hendricks introduced a South African sanitation action plan based on the outcomes of the Second Africa Sanitation Conference held in Durban in February as well as several water summits held around the country since 2005. The plan, which was to be submitted to the African Ministerial Council on Water in June, aims to accelerate the delivery of sustainable sanitation services.

Among others the action plan commits stakeholders to aim to spend 0.5% of GDP on sanitation. Hendricks said her department would call on the sanitation budget in the municipal infrastructure grant to be ring-fenced so as to ensure enough funds to sanitation projects.

She also called on provincial leaders to raise the profile of sanitation and hygiene in South Africa and recommit themselves to ensuring access to safe sanitation to all the country's citizens. "People still do not like to talk about such matters. It is our duty as stakeholders to make more noise around sanitation issues and thereby raise the profile and make an impact," Hendricks said.

Since 1994 almost 11 million more people have benefited from government's sanitation programme.

Harties residential estate opts for ozone-treated water

Locally-owned water quality treatment firm Purion has developed and delivered a domestic water treatment plant to another luxury residential estate near Hartbeespoort Dam, in the North West Province.

The 600 kℓ/day high-quality drinking water plant makes use of the company's proprietary Safewater system, which uses in-house developed ozone generators to treat water from, in this case, a number of boreholes on site. According to Terry Featherstone, Chairman of the Governing Body at The Coves, it was decided to use the ozone-based water treatment plant as a result of the deteriorating quality and quantity of the groundwater supply. "In the event that we can no longer make use of groundwater, we will be able to treat water directly from the Hartbeespoort Dam."

The Coves Lifestyle Estate makes use of a stop/start system, i.e. water is treated to fill the on-site reservoir which holds a 24-hour supply. Once the reservoir is filled, the operation is stopped. Once the reservoir is empty, water treatment starts again.

Purion Technical Director Dr Rian Strydom is confident that the company's locally designed and manufactured and supported water treatment system can treat any type of water, both from surface and underground as is the case with another installation at the Roodeplaat Dam. The Safewater system is scalable and custom designed for hotels and large resorts, residential and golf estates, mines and industrial estates, municipal water treatment works, hospitals, and commercial complexes.

The turnkey system takes water directly from the source. Depending on the source of water, the system is equipped with an advanced dissolved air flotation (DAF) system to float material, such as algae, before ozonation.

Following ozonation, using the in-house developed and manufactured ozone generators and air preparation systems, the detoxified water finally runs through a granular activated carbon bed where all remaining organic compounds and the residual ozone are adsorbed.

Upon plant commissioning and hand-



over, user or owner training is provided together with operating and maintenance options and dedicated 24/7 technical support of the installation.

"Ozone is a vastly superior disinfectant to chlorine, disinfecting around ten times more effectively", maintains Dr Strydom. "It remains the only real option to deactivate certain resistant viral strains, as well as parasitic species including *Giardia* and *Cryptosporidium*."

Ozone is a powerful oxidiser, which means that it will destroy many chemical molecules, or change them to more benign forms to enable safe discharge or supply of water. This includes endocrine disrupting compounds and personal care products now being detected in many water supply networks.

At present, Purion supplies this technology mainly to residential, industrial and mining sectors. The core technology also assists cooling water users to lower raw water demand volumes, eradicate chemicals and serve as a powerful anti-scaling agent in these closed systems.

Within the South African context, this locally-developed biotechnology offering now makes it feasible for districts and municipalities to adopt a decentralised, point-of-use treatment strategy to alleviate delivery pressure on traditional water services providers, reports Purion Executive Director Hawie Viljoen. "As a result of the lifecycle cost benefits of using a renewable resource (air) in our Safewater, Safewaste (for effluent disinfection) and Safecool ozone systems,

it has now become commercially viable in South Africa to adopt this superior level of oxidation and disinfection at most localities throughout the country. This is the result of applying the locally-developed technology, which is much more cost-effective than imported systems, primarily as a result of the Rand-based and highly transparent cost of local technical support."

Ecologically, it introduces a new era by breaking the cycle of perpetual chemical dosing of water and the associated carbon footprint of manufacturing,

transporting, storing and dosing, while at the same time delivering water quality of unprecedented safety to communities and estates.

"In addition, the application of these ozone technology solutions are increasingly being adopted as water security risk mitigation strategies, where ground and surface water resources of whatever quality can lawfully be utilised," concluded Viljoen.

Pump range turns 60

Denorco's Mono range of industrial pumps celebrates its sixtieth anniversary in South Africa this year.

The progressing cavity technology that is at the heart of the range of positive displacement pumps has successfully partnered South African agriculture and industry since 1935. The range has proved to be popular with the mining, petrochemical, chemical, pulp and paper, sugar, wastewater, food and beverage, pharmaceutical, agricultural and irrigation sectors.

"To this day, the Mono range of pumps is the benchmark for progressive cavity pumps in South Africa, where versatility and reliability are essential. Denorco continues to grow the sales of this highly regarded brand, and we see a great future for the range in time to come," said Denorco product manager Steven Rose.

SA firm concludes Madagascan weir contract

SSI Engineers & Environmental Consultants has almost completed the construction phase of a multimillion Rand contract awarded by QIT Madagascar Minerals in Madagascar.

The South African company's services have included a water resources study for the mine, detailed design and supervision for a salinity control weir, bulk water supply and wastewater treatment design for the mine and its residential villages, a landfill design, preparation of the water management plan and a stormwater management plan for the quarry.

Construction of the salinity control weir was scheduled for completion in June, ahead of the first production of ilmenite (titanium dioxide) from the mine, expected



in late 2008. The weir project was initiated to prevent sea water flowing back up the Anony River into Lake Ambavarano, the main water source for the mining operation.

"One of the main objectives for the weir was to limit any increase upstream flooding

– a critical issue in a coastal location with high storm frequency," reports SSI's Abhijatri Robinson. "We also had to optimise the height of the spillway by balancing the increased flooding versus the risk of overtopping from downstream initiated by wave, pressure and wind induced storm surge and the corresponding high tides."

Robinson notes that the detailed design of the weir's rockfill embankment was also a challenge as it needed to be constructed on a sand foundation in a very remote area.

The option selected could be constructed from local materials – rockfill flanks and a fine sand core – with no coffer dams by carrying out critical underwater work during the three-month drier season."

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