



World Water Day – working for a brighter water future

On 22 March we once again celebrate World Water Day.

This year is even more special as South Africa's Minister of Water & Environmental Affairs, Mme Edna Molewa, also hosts her SADC Colleague Ministers as the region celebrates this important day in South Africa this year. As a country we represent the global microcosm in many unique ways – not the least being an example of the crossroad between the developed and the developing world.

While we have challenges typical of the developed world, like ageing infrastructure and the water quality challenges associated with hundreds of years of resource intensive industrial activity, we still have the developing world challenges of non-universal coverage of water supply and sanitation and limited developed water infrastructure to support new entrants into the economy.

This is reflected by the trends in the water balance which increasingly move in the

direction of projected negative water balances where supply is being rapidly overtaken by increasing demand. This scenario is exacerbated by climate and weather forecast patterns. The world 'celebrate' may seem inappropriate in the light of these progressive challenges and yet it is not.

The first point of celebration on World Water Day should be an intensified appreciation of this increasingly scarce, most valuable resource. On the most personal level water cleanses us, nourishes us physically, emotionally, spiritually and socially. As a society we acknowledge that the very existence of human society and its development is tied to the availability of adequate water to meet all these demands on a global scale.

The second point of celebration is the increasing solidarity as individual communities, countries and regions realise the need to work together to ensure the best means of protection and sustainable use of the world's

precious freshwater resources driven by various factors. These include higher levels of appreciation of the shared nature of water, and the sharpened focus on the vulnerability of our water systems brought about by the global climate change dialogue and science. The declaration of 2013 as the United Nations Year of Water Cooperation is the theme we carry into our various 2013 institutional strategies. The gathering of the SADC Water Ministers on World Water Day 2013 is testament to this.

A third reason for celebration is the high level of scientific knowledge that is being generated to both increase our understanding of the challenges and developing solutions to meet them head-on. An Elsevier study of *Scopus* publications in 2011 indicated that globally the number of water-related research papers had increased by an average rate of close to 30% per year for the preceding 20 years. A second factor emanating from a 2012

WRC study, this time examining scientometric data from the ISI Thomson Reuters list of journals, indicate that water science productivity ranks 19th in the world and South Africa contributes 1.69% of the global share of water related papers compared to the national average of just below 0.5% for all disciplines. It would appear that the South African research community has reason to take a bow on World Water Day.

A fourth reason for celebration is that we are adopting a much more sophisticated approach to developing out the water problematique. We, the researchers, the decision-makers, the water managers and the user communities, are developing an appetite to the complex nature of this 'wicked' problem. The problematique is starting to approach the classical form of a problem tree that offers a framework for its solutions.

The WRC shall in this year of international water cooperation together with various partners, in particular the

Contextualising the Global /South African water challenge



The topmost circle describes that primary problem of the Demand/Supply equation that is beginning to lean toward a supply deficit. In South Africa this is on the back of the national initiatives to move toward universal water and sanitation access, 20 years of continuous water intensive economic growth and 200 years of industrial, mining and agricultural practices that have challenged the quality of water in our river systems. The further challenge is that an acceleration of economic growth is a fundamental part of the national formula to eradicate hunger, drastically reduce poverty and introduce more people into the ranks of the economically active population in South Africa. The next layer below talks to the challenges of infrastructure (both ageing and an inventory that says what we have is inadequate for South Africa's growing needs). The third layer is the summary of the capacity and capability challenge of inadequate human capital at the correct level of training and competence (technical and managerial), technology gaps as well as technology mastery capability. The final layer of the problem lies in the realm for an increased quantum of knowledge from the natural and physical sciences as well as the social and behavioural sciences to complete the problem-solving toolbox.

Departments of Water Affairs and Science & Technology, be seeking to cement a new set of functional international alliances for the South African water R&D community to make larger, more rapid, contributions to both obtaining a deepened understanding of the nature of the challenges and more importantly developing solutions, technologies and support materials and mechanisms to better enable South African water practitioners and their international partners to help us ensure a much more positive water enabled growth future for Planet Earth. Best wishes to all with your celebrations of South Africa's Water Week and World Water Day.



Domestic wastewater remains one of the most prolific causes of water quality problems in South Africa. The WRC-funded CSIR Sanitation Demonstration Centre, visited last year by the WRC Board, offers a range of sanitation solutions for municipalities.

Short courses for Water Utilisation Division and Environmental Management

Presented by the University of Pretoria, Department of Chemical Engineering



SHORT COURSE ON ENVIRONMENTAL MANAGEMENT & REGULATION

Dates: 25 - 28 March 2013
Course fee: R9200.00

SHORT COURSE ON INDUSTRIAL WASTE MANAGEMENT

Dates: 15 - 17 May 2013
Course fee: R5500.00

SHORT COURSE ON OPERATION OF WATER AND WASTEWATER TREATMENTS PLANTS

Dates: 10 - 14 June 2013
Course fee: R9900.00

SHORT COURSE ON WATER QUALITY MANAGEMENT AND EFFLUENT TREATMENT

Dates: 19 - 23 August 2013
Course fee: R10800.00

SHORT COURSE ON MEMBRANE PROCESSES

Dates: 02 - 04 October 2013
Course fee: R6700.00

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Dates: 28-31 October 2013
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Letter to the Editor

Prof Denis Hughes and the Uncertainties of Climate Science

The Water Wheel is to be congratulated on publishing the wise words of Prof Denis Hughes (*The Water Wheel* November/December 2012) on the uncertainties regarding climate change.

These statements are timely, accurate and relevant to the present stage of the climate change debate. For too long the proponents of Anthropogenic Global Warming (AGW) have claimed that the science is settled and the Intergovernmental Panel on Climate Change (IPCC) has contended that there is an overall consensus on the issue. Science, by the way, is not based on consensus as Prof Hughes has clearly outlined.

All the AGW forecasts are based on process models which rely essentially on assumptions, and there is no way that the models can be calibrated and proven accurate. This challenge has been carefully avoided by the majority of climate scientists and the technique of denigrating anyone who has the temerity to dispute their findings has been widely used.

As Prof Hughes has said this is not science. Einstein once said that in spite of the wide acceptance of his theories he was fully aware that it would take only one man to prove him wrong. The classic example of this denigration is the treatment meted out to Bjorn Lomborg, author of *The Skeptical Environmentalist*. He was eventually vindicated, but what happened showed the inability of the climate scientists, including South Africa, to meet dissidents in a reasoned, vigorous and open debate. Is it not time for the Water Research Commission to convene a series of seminars to encourage debate?

Can we accept unequivocally that if we change over to a low carbon economy we will avoid the effects of global warming? Why is it that much of the observational data is now suggesting increasingly that temperatures

appear to rise well in advance of the increase in CO₂? Have the scientists, and the politicians who glibly accept the versions the scientists are pedalling at present, given proper consideration to the implications and consequences of reducing CO₂ emissions or do they not understand the engineering implications of what they are saying? Where are the technologies for carbon capture, for increasing, by orders of magnitude, the present low load factors of renewables such as solar, wind and photo-voltaics or reducing the cost of these renewables? At present they do not exist except in theory.

To meet our needs for the immediate to medium term future while reducing CO₂ output the only options are nuclear or natural gas (South Africa is not endowed with any meaningful hydro-electric resources)? The environmental lobby will virulently oppose the introduction of the latest generation of nuclear power plants which offer the only realistic alternative to fossil fuels and will continue to demand unproven renewables. The present conflict, often ill informed, about fracking is another good example.

Finally, consideration has to be given to the alternative possibility that the rise in CO₂ is not the principal factor in global warming. What if the primary source is a cyclic increase in energy from the sun (the sun after all is the primary driver of climate for without it there is no life on earth)? If this is the case the solutions required will be very different from creating a low carbon economy and we may be faced with massive engineering projects to protect our cities against amongst other sea level rise (note that the sea level has risen about 130 m since the end of the last ice age 11 000 years ago). We need to heed the warnings of Prof Hughes and get a real debate moving before we waste huge sums of money that can be more effectively applied to improve the lives of ordinary people.

Robert GK Blyth, Pr Eng,
Cape Town

Esteemed award for CSIR scientist



The 2012 JD Roberts Award has been awarded to the CSIR's Dr Kevin Wall. Dr Wall, a registered professional engineer and

town planner, received the award for his leading role in developing innovative solutions for alternative housing, infrastructure asset management and the maintenance of sanitation systems.

Among his lifetime of achievements has been Dr Wall's work to apply franchising models to the supply and maintenance of sanitation infrastructure. His studies have found that the franchising concept and its success in the commercial sector show many characteristics which could alleviate problems encountered in municipal water and sanitation services delivery. At the same time, franchising has the added benefit of stimulating and supporting small business and black economic empowerment opportunities.

Dr Wall has led investigations into the potential of applying franchising principles in the water services industry by the WRC and CSIR since 2005. The franchising model has since been implemented in 400 schools in the Eastern Cape with another 1 100 to follow. In addition 600 households have already benefited.

Awarded annually, the JD Roberts Award is sponsored by Murray & Roberts and held in partnership with the CSIR. Instituted by the contractor in remembrance of company founder Dr Douglas Roberts, the award recognises and promotes competitive and environmentally-sustainable solutions to human dilemmas and encourages scientific research into technology that will enhance the quality of life of all South Africans.

Source: CSIR

CSIR & DWA seal relationship with MOU

The Department of Water Affairs (DWA) and the CSIR have signed a Memorandum of Understanding (MOU) to jointly develop appropriate and relevant research and technology capabilities to address national priorities in the water sector.

According to CSIR CEO, Dr Sibusiso Sibisi, South Africa's water situation presents the country with an enormous range of opportunities. "In this regard, the multidisciplinary nature of the CSIR allows us to draw from a wide range of skills and expertise in the field of water management."

It was through partnership with the DWA that the organisation hoped to develop an integrated and multidisciplinary solution to contribute to the equitable, efficient and sustainable use of water to ensure that South Africa attains its social and economic growth and development aspirations, Dr Sibisi said.

The MOU follows a number of strategic discussions between the two parties. Cooperation will be sought in a number of thematic areas, including water security in terms of quantity and quality; infrastructure and integrated water resource planning; sector-wide partnerships and collaboration to enable more effective sharing of information; and joint capacity building, among others. Speaking at the event, DWA Director-General, Maxwell Sirenya said: "At a national level, strategic interventions are needed so that we can do things differently. This requires a holistic response, as we have seen that a fragmented and isolated approach results in ineffective solutions."

The CSIR's research work in the areas of water science and catchment management, systems modelling and economic and social sciences, as well as building and construction innovation, among others, hopes to address some of these challenges.

New programme to build capacity in environmental sector

The South African National Biodiversity Institute (SANBI) has embarked on a major skills development and job creation pilot programme.

Dubbed 'Groen Sebenza' (meaning 'green work') the programme is aimed at developing priority skills in the biodiversity sector to create sustainable

job opportunities for 800 unemployed graduates and matriculants. The human capital development strategy for the biodiversity sector indicates that South Africa has a shortage of skills to manage its biodiversity. Various historical inequalities have also contributed to this skills shortage.

The Groen Sebenza programme has been initiated to respond to these demands, as identified by the various research efforts conducted in the sector. SANBI is partnering with 33 organisations from all tiers of government, non-governmental organisations and the private sector.

According to SANBI, the programme brings young South Africans from previously disadvantaged backgrounds together with experienced biodiversity professionals to learn, grow and eventually gain the competence and confidence to embark on rewarding and meaningful biodiversity careers.

Tender irregularities hamper infrastructure development, built environment professionals say

South Africa's built environment professionals have voiced their concerns regarding infrastructure bottlenecks and lack of infrastructure delivery in the South African sector.

The Built Environment Professions Grouping (BEP) noted their dismay with perceived inadequacies in government mechanisms to procure professional services. The grouping comprises the Association of Construction Health and Safety Management; Association of Construction Project Managers; Association of South African Quantity Surveyors; Consulting Engineers South Africa; Institute for Landscape Architecture in South Africa; South African Black Technical & Allied Careers Organisation and the South African Institute of Architects.

While these professional bodies welcomed government's revised infrastructure budget in terms of the 18 Strategic Integrated Projects as a positive move, they argue that the barrier to infrastructure delivery lies in the lack of transparency during the procurement processes related to the allocation of professional services and tenders. This manifests itself in the form of obscure decision-making processes and unequal distribution of professional services bolstered by a high potential for corruption coupled with weak accountability mechanisms and lack of scrutiny over allocation of public funds.

One mechanism believed to curb possible corruption is by having greater transparency in the procurement cycle, while the grouping maintains that construction contracts awarded should be openly published. This will increase accountability with infrastructure stakeholders they say.

The BEP further believes that government must include a compulsory evaluation and monitoring unit tasked to, among others, ensure that professionals and departments comply with legislation and offers made with respect to skills and skills transfer made during the bidding stage.

"Professional service providers must be appointed based on a best weighting for price, quality and preference. Best practice in the procurement of professional services is achieved by using a mutually agreed selection methodology (within the legal procurement frameworks) that does not detract from the economic and skills transformation objectives of government," said the BEP in a statement.

"It is vital that the government and built environment professionals work together to create a conducive, sustainable, non-exclusive procurement environment with definitive transformation objectives to ensure efficient project service delivery as well as the sustainable development and growth of the built environment industry."

Flamingos return following Cape river clean-up

The City of Cape Town is celebrating the return of the Greater Flamingo to the Black River following intensive river clean-up operations.

According to Chair of the Cape Bird Club Conservation Committee, Dr Dave Whitelaw, the Black River is a prominent feature of the city's landscape, being visible from two major roads. "For a number of years, there has been a gradual choking of the river by water hyacinth. The City's perseverance in removing this water weed is applauded, from which the city's image and bird life can only benefit."

The ongoing clean-up programme of the Black River started last year. It entails the control of invasive plants,

removal and disposal of litter, repairs to leaking sewers, and identification of pollution hotspots. While improving the state of the river, the programme is also providing much needed jobs.

"We are committed to building an inclusive and caring society, which means using all of the resources at our disposal to look after the various communities of Cape Town – and the environment in which they live," said Mayoral Committee Member for Economic, Environmental and Spatial Planning, Belinda Walker. "By investing in environmental sustainability projects we are protecting this environment for future generations."

Source: City of Cape Town



WRC Executive Manager chosen as Green ambassador



Water diary

Industry & water March 11-12

The National Cleaner Production Centre of South Africa is hosting the country's first Industrial Sustainability Conference. The conference will focus on issues around enhancing industrial competitiveness through resource efficiency and cleaner production. *Tel: (012) 841-3772; Email: ncpc@csir.co.za; Visit: www.ncpc.csir.co.za*

International Water Day March 22

International water day is celebrated around the world. This year's theme is 'water cooperation'. *Visit: www.watercooperation2013.org*

Water & Sanitation April 9-11

The International Water and Sanitation Centre (IRC) together various partners, including the African Ministers' Council on Water, WaterAid, and the Water Supply and Sanitation Collaborative Council are hosting a global symposium on Monitoring Sustainable WASH Service Delivery in Addis Abeba, Ethiopia. *Email: symposium@irc.nl or Visit: <http://monitoringwashservicedelivery.eventbrite.com>*

Indigenous knowledge April 17-20

The Department of Science & Technology, in collaboration with North West University, is hosting an international

conference on indigenous knowledge systems at the Birchwood Hotel, Gauteng. The conference will bring together experts, academics, policy makers, government officials, and civil organisations to deliberate on how indigenous knowledge systems, as it relates to science and technology, can be used to the advantage of indigenous and local communities. *Email: enquiries@nstf.co.za or Visit: www.nstf.co.za for more information.*

Sludge management May 6-8

The purpose of this conference is to provide a forum for researchers and practitioners to exchange the latest developments in sludge management. *Enquiries: contact Erik Dahlquist at Email: erik.dahlquist@mdh.se or Visit: www.hsm2013.se*

Hydrology & ecology May 13-16

The 4th International Multidisciplinary Conference on Hydrology and Ecology will take place in Rennes, France with the theme 'Emerging Patterns, Breakthroughs and Challenges'. The conference enjoys the support of the International Association of Hydrological Sciences. *Enquiries: +33 2 23 23 5068; Fax: +33 2 23 23 6077; Email: HydroEco2014@univ-rennes1.fr or Visit: <http://osur.univ-rennes1.fr/HydroEco2013/>*

Newly promoted Water Research Commission Executive Manager: Business Development, Marketing and Communications, Dr Inga Jacobs, has been selected as a recipient of the Green Matter Senior Fellows Award.

Green Matter is a public-private initiative championing the development of quality biodiversity skills. The Green Matter Fellowship is designed to connect a community of outstanding biodiversity champions, to support their professional development and positively profile their work and the biodiversity sector.

The Senior Fellows award recognises the contributions of sector leaders and supports their ongoing work to help support human capital development in the sector. The tenure of the award is one year. During this time, Senior Fellows are expected to play an ambassadorial role for the sector and the Fellowship.

Senior Fellows are also expected to engage with the rest of the Fellowship participants (bursary and professional development award recipients), through face-to-face and virtual networks, and to act as role models and mentors to others.

New drinking water plant for Botswana

VWS Envig, a subsidiary of Veolia Water Solutions & Technologies South Africa, has been awarded a contract by the AEVMI joint venture to design, supply and commission a 6 000 m³/day potable water plant in Maun, northern Botswana.

Located near the banks of the Thamalakane River, the plant is scheduled to be commissioned in September, and will be operated and maintained by Veolia for a subsequent six-month period. The new plant will augment the supply from existing underground water sources which become impractical to maintain during the Okavango Delta's flood season. To maintain consumer demand during these periods, the plant will source water directly from the river.

"River water is high in dissolved organic compounds that give it its characteristic brownish colour and earthy smell and taste, despite its normally low turbidity," explains Peter Healy, VWS Envig Botswana MD. "To make this water suitable for human consumption, we opted for clarification by means of ballasted flocculation to remove the extremely

light-weight organic particles that would otherwise settle very slowly."

Veolia will install its patented Actiflo high-rate clarification system. Featuring footprints that are five times smaller than conventional clarifiers, the system should achieve rapid settling. Healy explains that, after clarification, the water will be polished with multimedia and granular activated carbon filters, and finally disinfected before being fed into the town's pipeline system.

The organisation recommends structural changes to the way in which municipal engineers operate, including the abandonment of long-term employment contracts for key technical and managerial staff. "Tender and bid evaluation committees must include technical, legal and financial executives in joint sittings and professional teams must be allowed to compile reports in an independent manner on tender for the bid evaluation committees."

CESA also calls for the inclusion into procurement legislation of a bribery and corruption act for more stringent action against offenders.



Water by numbers

- **R5** – The price of Rhodes University's 'idiot-proof' home water quality testing kit, as reported by the *Daily Dispatch*. The kit, developed by doctoral student Catherine Luyt, uses hydrogen sulphide (H_2S) strip testing to gauge water quality.
- **4 677 Mℓ** – The peak day demand experienced by Rand Water in 2012. The water utility supplied, on average, 3 980 Mℓ/day of water to its customers last year.
- **15 000** – The estimated number of crocodiles that landed up in the Limpopo River from a crocodile farm in Pontdrif following floods earlier this year, *Beeld* newspaper reported.
- **1,3 billion tons** – The volume of food that is wasted each year, according to the Food & Agricultural Organisation, placing unnecessary strain on natural resources. In many African countries the post-harvest losses of food cereals are estimated at 25% of the total crop harvested.
- **7 kg** – The average amount of food wasted per person every year in South Africa, according to the CSIR.
- **13%** – The percentage of wetlands which are still in a natural state in the Western Cape, according to the latest province *State of Biodiversity 2012* report. A further 34% of wetlands have been moderately modified while the remaining 53% are in a critical state.
- **17%** – This is the percentage of river length the Western Cape needs to protect in order to conserve its threatened freshwater fish species, according to the above report.
- **3 100 km** – The length of the South African coastline. There are 300 functional estuaries along the country's coast.

Professional body calls for more investment in municipal engineers

Corruption and tenderpreneurship, fraud, financial mismanagement, lack of understanding of technical issues/priorities, difficulties with job creation and skills shortages are just some of the challenges that face municipal engineers in South Africa.

According to Consulting Engineers South Africa (CESA), if the country is serious about the empowerment of properly qualified municipal engineers, government should invest in various interventions such as training, development and capacitating of young engineers for employment by the local authorities and make the municipal engineering profession attractive. "Currently, municipal planning is done rather superficially

and only a real municipal engineer and a competent team of visionary planners can sort that out," the organisation said in a statement. "This calls for innovation in unlocking projects, a win-win-mentality, and an entrepreneurial delivery mechanism with sharing of risks."

CESA calls for the embracing of the municipal engineer as a trusted advisor as well as creating a working environment to attract and retain municipal engineers. "Infrastructure delivery's biggest stumbling block is the lack of business integrity which involves, among others, socialising with clients, conflict of interest, use of agents and partners, collusion and bribery and the disregard of procurement regulations."

International award recognises drinking water quality

The International Water Association (IWA) has awarded Rand Water with an Honorary Award for Excellence in managing its drinking water quality. The award recognises the complexity of the water utility's operations as a bulk water supplier. IWA commended Rand Water for developing a comprehensive training programme and introducing asset lifecycle management as part of its

water safety plan.

The IWA Drinking Water Safety Award scheme recognises excellence in the management of drinking water quality. The scheme is aimed at service providers in low and middle income countries who have made demonstrable progress in improving and sustaining the quality of water provided to urban or peri-urban populations.

Source: Rand Water

Century-old East London WTW in line for major upgrade

The 100-year-old Umzonyana Water Treatment Works, in East London, is to be refurbished in a R50-million upgrade project which will increase its treatment capacity by 30 Mℓ/day.

Royal HaskoningDHV (formerly SSI) has been appointed as the consultant for the project by the Buffalo City Metropolitan Municipality.

"The existing water treatment plant was built in the early 1900s as the main water supply to the Borough of East London and the treatment works has been progressively enlarged from the initial

small, slow sand filtration plant to the existing sophisticated treatment works," reports project manager Victor Helberg. The plant has a present output of some 120 Mℓ/day.

The aim of the project is to meet the increased drinking water demand coupled to new developments and growing number of households in the Buffalo City metro area. The upgrade, which is calculated to meet the anticipated water demand for the next 15 years, will involve the design and implementation of additional sedimentation tanks, sludge ponds, upgrading of

Water on the web

www.thinkeatsave.org

This website forms part of the 'Reduce Your Footprint' campaign launched earlier this year by the United Nations Environment Programme, the Food & Agriculture Organisation and other partners. The website offers simple tips to consumers and retailers on how to stop food wastage. It also allows users to make food waste pledges and provides a platform for those running campaigns to exchange ideas to create a global culture of sustainable consumption of food.

www.thewaterchannel.tv/

The water channel is an open resource with videos related to water. The website supports, stimulates and inspires people all over the world to work towards better management of water and natural resources. The site is supported by various organisations, including UNESCO and Cap-Net.

<http://www.capetown.gov.za/en/KeepSavingWater/>

The City of Cape Town's Water & Sanitation Department has launched a new dedicated website aimed at encouraging residents to save water. Online information includes water saving tips, alternative water resources, borehole registration procedure, educational resources, downloadable interactive water audit, posters, pamphlets and videos.

the Mdantsane pump station No. 2, new chlorination and ammonia plants as well as new inlet works.

"The project is especially challenging as portions of previous upgrade work were designed by other consultants, and construction of certain works has been started but not completed," notes Helberg. "Part of our remit is to investigate and incorporate those portions of works into the new upgrade to ensure their effective and beneficial use."

The project is expected to be completed by December 2014.