

ReWater

Water recycling in Australia

WINTER 09



Securing the future of farming in Tasmania

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On the cover:

Photo courtesy of Hydro Tasmania.

About ReWater

This newsletter, ReWater, has been designed to make information relevant to recycled/recycled water use in horticulture more accessible to horticulturalists (growers/farmers), the water industry and other interested people. It is part of the service provided by the Australian Coordinator for Recycled Water Use in Horticulture, funded by Horticulture Australia.

Back issues and instructions for subscribing to receive ReWater electronically quarterly can be accessed at www.recycledwater.com.au/rewater

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www.recycledwater.com.au



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Butt welding poly pipe in preparation for the first of three river crossings.

New pipeline secures the future of farming in Tasmania's Macquarie Settlement region

The \$7.5 million private irrigation scheme delivers a guaranteed 30 megalitres per day supply of irrigation water recycled from the Poatina Power Station reregulation pond to 19 farms.

The pipeline extends 17 km to the Macquarie River. It was funded by the Macquarie Settlement Pipeline Partnership and delivered in partnership with Hydro Tasmania, and Tyco companies Water Dynamics and Water Infrastructure Group.

Hydro Tasmania has a pipeline incorporated in the scheme for the first 5 km terminating at Lake River to supply additional irrigators on the Lake River system.

The pipeline was launched in April this year by Tasmanian Premier David Bartlett who said that the project was a great achievement for hard working farmers and local contractors.

"I am convinced Tasmanian agri-business will lead an economic recovery in this state and entrench it for the future.

Strategic investments in irrigation are vital if Tasmania's potential is to be realised as a major food bowl for the nation," Mr Bartlett said.

Robert Bayles, Chairman of the Macquarie Settlement Pipeline (MSP) Partnership, said that the irrigation scheme

Optimising the pipeline design to suit different scenarios for the volume of water required and the needs of the end users was an interesting challenge.

was an ambitious project that had been successfully delivered as a result of a cooperative partnership between public and private businesses.

"This scheme ensures that our children, and our children's children, will be able to stay on the land and continue farming in the region. Having a secure supply of water means that we can continue to invest in our businesses, and diversify and expand to remain competitive in

continued page 3



Hydro Tasmania and Macquarie Settlement Partnership members at Macquarie River outlet.

the global economy. It's about creating a sustainable future for the next generations," said Mr Bayles.

Water Dynamics in conjunction with the MSP Group, developed the concept for the irrigation scheme at their Longford office in Tasmania. This involved the formation of an official entity that sits under the Elizabeth Macquarie Irrigation Trust. A steering committee was formed and Water Dynamics worked through a number of designs to finally arrive at an economic solution.

Jeremy Cox, Manager of Water Dynamics Tasmania, said that optimising the pipeline design to suit different scenarios for the volume of water required and the needs of the end users was an interesting challenge.

"After 13 months of planning, design and consultation it was a great day when the final project scope was reached and we could complete permits and approvals, commence procurement and get construction underway," Jeremy explained.

Commercial and project management services were provided by Tyco International's Water Infrastructure Group. The project was delivered on budget to provide water at a very economical rate in comparison to many other schemes.

Both the Macquarie Settlement and Lake River pipelines will be operated by the Settlement Pipeline Partnership. ●

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Van Buren County, city of Clinton looking to future

Overcoming disaster with recycled water

The city of Clinton (USA) with the help of Siemens Water Technologies has found a way to use the water treatment facility to recycle contaminated water used in the natural gas drilling process. Officials said they hope to begin recycling thousands of gallons of the water within two months.

Van Buren County and Clinton are in the heart of the Fayetteville Shale formation, which during the past six years, has become a drilling Mecca for natural gas companies, who have been leasing mineral rights, paying property owners and erecting wells across the county.

Clinton Mayor, Roger Rorie said, the city has profited to the tune of about \$1 million from the drilling activity. That came from the sale of water for drilling and selling mineral rights on city-owned property to companies interested in striking it rich in north central Arkansas.

But Rorie said he thinks the city can do even better by using its idle water treatment plant to recycle the used drilling water.

He he has had tentative talks with four companies that do drilling in the area about recycling the water.

"They use a lot of water," Rorie said, adding that, while some companies store the used water in containment ponds or "land farms," most of the water is inject-

ed deep into the earth's surface, meaning it's gone forever.

Last week, the Arkansas Department of Environmental Quality announced that environmental contamination was found in the 11 permitted land farms in the state, where water used in the drilling process is stored after use and later spread on vacant land.

most of the water is injected deep into the earth's surface, meaning it's gone forever.

Rorie said the city would recycle the water brought to the plant by the drilling companies, and then

sell it back to the companies after it has been cleaned.

Not only will the city make money, but also the drilling water will be recycled, thus lessening the strain the process has placed on the area's water supply.

"Yes, the city stands to make money, but we're more concerned about the environment and recycling the water and protecting the city's water table," he said.

Along with paying off the \$3.8 million still owed on their water treatment plant, Rorie said, any additional money the city makes on recycling the water would be used to fund a newly created county Economic Development Commission, which is trying to recruit manufacturing jobs to the area. ●

Source: Rob Moritz, Arkansas News Bureau; 26/4/2009
<http://arkansasnews.com>



Four ponds at the Clinton West Wastewater facility can hold about one million gallons each.

Image: Arkansas News Bureau

National Performance Report (2007 – 2008)

Overview of urban water utilities illustrating total recycled water supplied (ML) and percent of effluent recycled

Introduction

Recycled water, whereby sewage is treated to a standard that is 'fit for purpose' and reused by residential or non-residential customers, is becoming an increasingly important water source for utilities around Australia.

In general terms, recycled water is categorised according to the nature of treatment the sewage has been subjected to and its intended purpose. The highest class is potable recycled water, which is treated to a standard high enough for human consumption.

Beneath potable recycled water, there are various levels of recycled water quality, which depend on the nature of the end use of the recycled water. Uses include watering raw crops, replacing potable water in industrial systems and processes, watering forests, wetlands, parks and gardens and for household use on private gardens and toilet flushing. At present, recycled water is being used predominantly for agricultural purposes (see indicator W22 in Part B of the National Performance Report).

Investment in recycled water infrastructure

Over recent years there has been significant investment in recycled water infrastructure, and many utilities have forecast high recycled water capital expenditure over the coming years. Governments, utilities and customers have recognised the role that recycled water can play in achieving sustainable water outcomes and restoring the supply/demand balance.

Recycled water projects range in scale and scope. Selected recycled water projects that demonstrate the varying nature of recycled water projects around Australia include:

- The \$2.5 billion Western Corridor Recycled Water Project in South East Queensland, currently being overseen by a special purpose vehicle created by the Queensland Government. The project will be able to supply 232 ML of purified recycled water per day to various non-residential customers including power stations, other industry and agriculture and will also supplement drinking water supplied in Wivenhoe Dam.¹
- The \$75 million Glenelg to Adelaide Park Lands Recycled Water Project, being delivered by the CityGreen

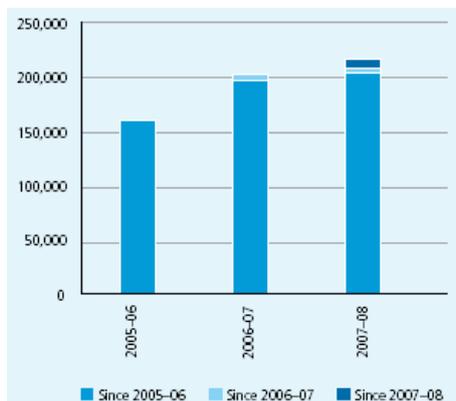


Figure 1 – Recycled water supplied (ML)
All utilities that have reported data from 2005-06 to 2007-08.

Alliance of SA Water, United Water, Leed Engineering and Construction, Leighton Services and Guidera O'Connor as part of the Water Proofing Adelaide initiative. This project will provide 3.8 GL of water annually to Adelaide Park Lands and Adelaide City by mid 2010.²

- The \$10 million Alice Springs Water Reuse Project, undertaken by Power and Water Corporation which recently began operating and aims to deliver up to 900 ML of recycled water to the Arid Zone Research Institute, where it will permeate through the soil into underground storage systems and aquifers.³

Recycled water use

The impact of changing rainfall patterns and the increasing acceptance of recycled water as a viable, safe alterna-

tive to traditionally sourced water have resulted in an increase in recycled water use. The volume of recycled water supplied is presented in Figure 1 and shows a marked increase in 2006-07 compared with 2005-06.

Recycled water increased by 23% in 2006-07 with a smaller 6% increase in 2007-08. Each series in Figure 1 (e.g. 'since 2005-06') represents the recycled water supplied by utilities that began reporting in that particular year.

Over the same time period, the percentage recycled (as a proportion of sewage collected) has increased from 9% in 2005-06 to 11% in 2007-08. This is largely driven by utilities in the largest size grouping,⁴ which collects 85% of the entire water industry's sewage. Figure 2 shows the percentage recycled for each of the four size groupings over the past three years.

As is evident from Figure 2, the smaller the size grouping, the larger the proportion of recycled water. Smaller utilities are often more able to provide recycled water, as irrigable land is typically located closer to treatment plants in smaller population centres than larger ones. Since these utilities also collect less sewage, they can sometimes store recycled water for future years.

Recycled water will continue to be an important alternative source of water in the future. Increased awareness of recycled water's quality and continued consumer education of the importance of sustainable water solutions should ensure recycled water becomes more accepted within the community. ●

1 Western Corridor Recycled Water Pty Ltd 2008, Annual Report 2007-2008, p.2

2 SA Water website, http://www.sawater.com.au/SAWater/WhatsNew/MajorProjects/Glenelg_parklands.htm

3 Northern Territory Government 2008, Water Reuse in the Alice Fact Sheet (NT Government 2008)

4 For calculation purposes, Melbourne Water has been included in this size grouping.

Source National Water Commission
for more information see: www.nwc.gov.au

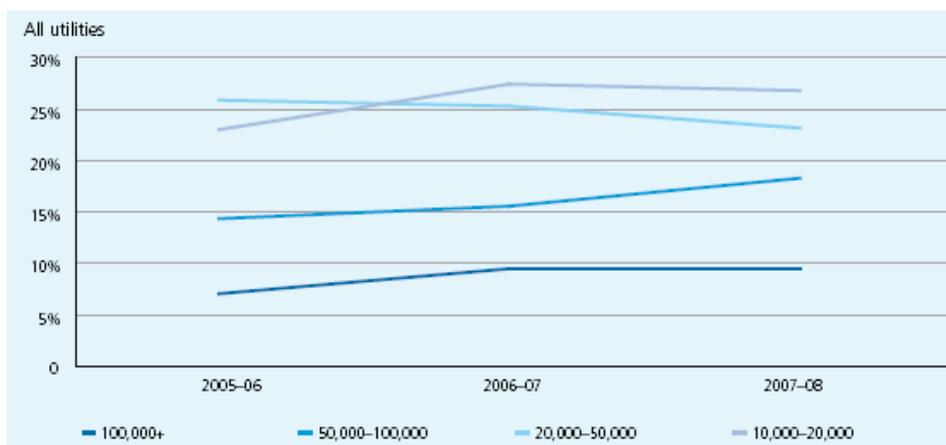


Figure 2 – Recycled water (per cent of effluent recycled).

Coast student research clears water

If you spent a summer researching potential hazards in recycled water, would you still drink it?

“Absolutely!” says University of the Sunshine Coast honours student Jane-Louise Lampard, who has achieved national recognition after her scholarship project on water quality was reviewed by a panel of experts.

Ms Lampard, 37, of Dicky Beach, was the only Queenslanders selected for a \$5000 summer scholarship from Water Quality Research Australia, a national research organisation that focuses on urban water issues related to public health.

She came second at the recent Melbourne presentations, and has already landed a part-time job as research assistant with government-funded group Smart Water Research Facility.

Ms Lampard looked at emerging contaminants of concern in wastewater recy-

cling and how people might be exposed to these contaminants through sources other than water.

“I found that the concentrations we could be exposed to from drinking recycled water were considerably lower than what we’re exposed to from other sources such as food intake and lifestyle choices,” she said.

“With the phthalate (chemical in PVC and food packaging) for example, we’re exposed to a much higher concentration in our everyday work environments, through floor and wall coverings, plastic things on our desks and furniture.

“In addition, the estimated concentrations were lower in recycled water than we’d expect in the current drinking water.”



Ms Lampard said the scholarship was a great opportunity to network at a high level in the industry and with potential employers. ●

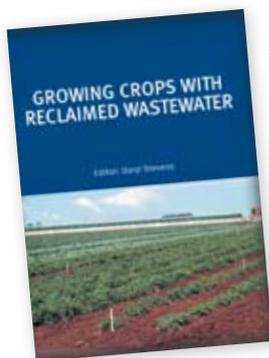
Source: Sunshine Coast Daily Online 30/3/20098
www.thedaily.com.au

GOOD READS and website links

WSUD: Basic procedures for source control of stormwater. Handbook of Australian Practice.

John Argue's title in a new printing: This title remains the first choice reference for local government, consultants and WSUD practitioners. Price \$167 plus p & h.

AWA bookshop Email: bookshop@awa.asn.au



Growing Crops with Reclaimed Water

This comprehensive work examines the fundamentals required for reclaimed water schemes to deliver sustainable farming operations that achieve the yield and quality of produce necessary for acceptance in the market. With a focus on agricultural and farming users, this useful book explains how recycled water can be prepared and delivered with a balance of nutrients to meet the needs of a specific crop. The information provided is factual, logically and simply presented and backed by useful charts and tables. Costs \$130 plus p & h.

AWA bookshop Email: bookshop@awa.asn.au
www.awa.asn.au

Water Treatment. Principles and Design. 2nd edition.

Completely revised and updated to current practices and technologies, particularly in the areas of disinfection, membrane filtration, disposal of treatment plant residuals, and basic microbiology with an emphasis on human pathogens and diseases. From theory and principles of water chemistry and microbiology to in-depth discussions of revolutionary treatment processes to concise tips for plant and network design. AWA member price \$199 plus p & h. Non-member \$235.

AWA bookshop Email: bookshop@awa.asn.au

The Water Workforce. Strategies for Attracting and Retaining High Performance Employees.

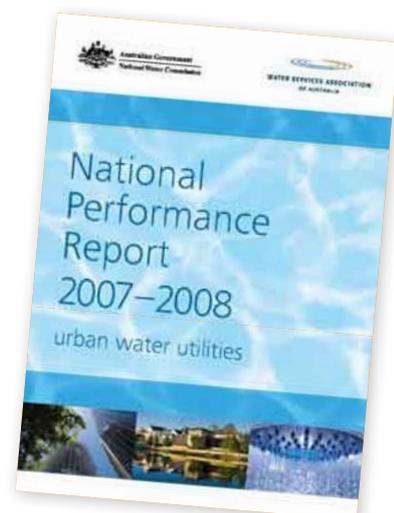
This title examines the human resource challenges facing utilities and offers tested strategies to address them. It will help you recruit, train, motivate, and retain high-quality employees-and build a stable and productive workforce that will meet the short- and long-term needs for water focused businesses. AWA Member price \$148 plus p & h.

AWA bookshop Email: bookshop@awa.asn.au

National Performance Report 2007 – 08: urban water utilities

In its third year of publication, this National Performance Report is the world's most comprehensive and detailed document on the performance of urban water utilities. The report is based on the principles of comparability, accuracy and consistency, and spans all critical performance areas of water resources - health, customer service, asset management, environmental, finance and pricing. The report includes information from 82 water utilities that supply approximately 16.8 million Australians with their urban water services.

www.nwc.gov.au



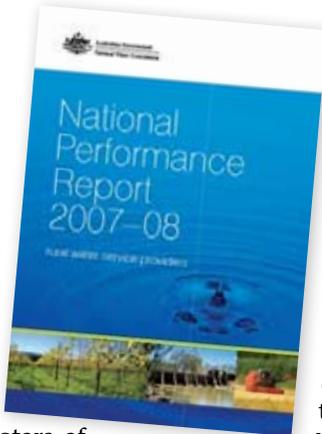


GOOD READS and website links

National Performance Report 2007 - 08: rural water service providers

This is the second annual performance report and publishes comprehensive data for 13 rural water service providers across Australia. The data covers up to 54 indicators of performance across key areas spanning characteristics, service, environment and finance. Building on the baseline established in the initial 2006-07 report, trend analysis will continually improve as more annual reports are produced.

For more information see: www.nwc.gov.au



Integrated Water Recycling Online Training, Australia-wide.

AWA in collaboration with the University of Wollongong has created a series of webinars to provide participants with an understanding of current technical, environmental, legal and social issues for delivery of recycled water. Ideal for technical professionals who have recently moved into delivery of recycled water projects, government planners and consultants and students upgrading their knowledge of water technology, practices and management.

For more information see: www.awa.asn.au

Potable Recycled Water on Catalyst - 27 March 2009

ABC TV's Catalyst program recently aired a segment about potable recycled water. To view the story see: www.abc.net.au

Water and Wastewater Calculations Manual. 2nd edition by Lin.

Hundreds of water and wastewater engineering calculation procedures, ranging from simple to complicated. Each calculation includes a step-by-step procedure for performing the calculation, along with examples illustrating the important concepts in the procedure. All are field-proven, efficient methods for solving water or wastewater problems. Costs \$172 plus p & h.

AWA bookshop Email: bookshop@awa.asn.au

Sustainable wastewater management at Devils Creek

Recycled Water polished to enable irrigation with conventional sprinkler systems

Apache Energy Ltd has recently completed a major accommodation facility (\$19 million) for their Devil Creek Gas Plant located some 40km South West of Dampier in Western Australia. The Devil Creek site will accommodate up to 300 construction workers and gas plant personnel.

As with all isolated camps like these, part of the development approvals are based around sustainable waste water management and Campbell Durrant, Managing Director of local Perth company Biomax won the tender to treat all effluent water produced from site. Biomax waste water treatment systems treat raw effluent to an average effluent quality of 5 mg/L BOD and 10 mg/L TSS. The C100K installed at the devils Creek site will treat up to 100,000 Litres of effluent in a 24 hour period.

Generally treated effluent from these systems are dispersed via drip irrigation but in this case Biomax were asked by their client if they could use this treated effluent to irrigate around the accommodation buildings with conventional sprinkler systems. This was not possible without further polishing of the water so a Netafim Sewaclear was ordered to

achieve the water quality desired by the local health authorities.

The Netafim Sewaclear is designed to reclaim secondary treated sewage from a sewage treatment system and to purify it to an unlimited level for irrigation purposes. A basic system consists of the following components:

- Coagulation – Allum dosing to remove the colloidal particles from the influent in order to improve the permeate quality.
- Multi media depth filtration – performed by an array of multimedia filters using an array of media layers as gravel, sand and anthracite as a bed that captures the suspended matter for final effluent polish in the water flowing through
- Disinfection – injection of hypochlorite/chlorine to remove all pathogenic microorganisms from the treated water. The disinfecting unit is fully automatic and controlled by a residual chlorine controller.
- Automation and control – the systems are equipped with PLC (Programmable Logic Controller) which supervises the entire automatic functioning of the separation and filtration process. The media tanks back wash automatically by differential pressure or when a preset time interval elapses.



Filtration system.

The unit comes neatly fabricated on three skids each weighing around 250kg before the filling of the media. The skids are then placed together in a line and connected via victaulic couplings.

Since installation everything has been inspected by the Shire Health Officer and is approved for use. Independent testing by the Chemistry Centre in Perth confirms that once the water from the camp has passed through the Biomax WWTP and Netafim Sewaclear system the final polished effluent wastewater achieves the required water quality standards. There is no odour or staining associated with the re use of this water.

A second Sewaclear system is being installed at the Woodie Woodie accommodation camp in the Pilbara next week with a third unit expected to be ordered for another project soon.

"We see plenty of potential for these systems coupled with the Biomax system in the future" Campbell Durrant said. ●

For more information contact: Campbell Durrant from Biomax on 0419 941 163 or email Campbell@biomax.com.au or phone Netafim Australia on 03 9369 8777.

Class A recycled water growth for Melton

Conserving more than 18 million litres of drinking water a year

A \$2.8 million 7km pipeline project will bring Class A recycled water to the new \$45 million headquarters of Harness Racing Victoria (HRV) near Melton as well as servicing the new Toolern precinct.

Western Water Managing Director John Wilkinson said the completed pipeline would make Class A recycled water available for use along its route, in commercial premises and for toilet flushing and garden watering in new residential development.

"Using recycled water for appropriate purposes will conserve more than 18 million litres of precious drinking water each year at the HRV site alone," Mr Wilkinson said.

HRV will use recycled water for dust suppression during race meetings and for landscaping across the site.

The project is a partnership between Western Water, the State Government, Melton Council and HRV.

"The pipeline will bring important economic benefits, attracting new investment and building long term jobs and economic prospects in Melton shire," said Don Nardella MLA, Member for Melton.

"As the Victorian community leader in recycled water re-use, Western Water is to be congratulated in this further critical infrastructure, building on the economic



Construction of the new Class A Toolern Pipeline.

growth and jobs with the ground-breaking Sunbury to Melton recycled water pipeline"

Western Water has committed \$1.44 million to the pipeline's development, Regional Development Victoria has contributed \$500,000, Melton Council has contributed up to \$500,000, and HRV has contributed \$356,000. The pipeline is due for completion by May 2009.

"The development of this pipeline from our Class A treatment plant at Melton South has been brought forward by at least two years thanks to the funding from our partners," said Mr Wilkinson. ●

For more information contact:
Western Water
Phone: 1300 650 425
www.westernwater.com.au

Recycling at the Opera House



Saving 15 million litres of drinking water a year

Opera House staff have installed new technology that allows it to use water sucked from Circular Quay to absorb heat from its air-conditioning system, saving 15 million litres of drinking water a year.

In other moves; water used for cleaning the boardwalk and outside footpaths is now

being recycled, and staff have switched to using baking soda and water to clean concrete, cutting the need for toxic chemicals. All 70 shower heads have been replaced with water efficiency models, saving about 600,000 litres a year. ●

Source: Sydney Morning Herald 16/3/2009
www.smh.com.au

Taking the lead

Using recycled water for groundwater recharge

The Orange County Water District has taken the lead in using recycled water for groundwater recharge. Last year, it unveiled a \$485 million Groundwater Replenishment System in Fountain Valley that takes treated sewer water and puts it through a three-step purification process. Officials say the filtration process is more stringent than what is used by most water-bottling companies.

The plant generates about 64 million gallons of water a day, half of it pumped into the water district's seawater barrier that prevents salty ocean water from contaminating the groundwater supply.

The other half is piped to ponds in Anaheim where it mixes with Santa Ana River water and then is allowed to percolate into deep underground aquifers. Wells then pump the groundwater into half the homes in north and central Orange County.

The concept of turning sewer water into drinking water isn't easy for some to swallow. San Diego has faced backlash from residents who are grossed out by the idea. The city recently got funding to build a demonstration project, which they hope will change public attitudes.

"Psychologically, it's still difficult for people to accept," said Mehul Patel, the Orange County district's principal process engineer. That's why Orange County launched an early and aggressive public relations campaign to show residents that the water is safe to drink - and it worked, Patel said.

Inland water agencies, including the Inland Empire Utilities Agency and Eastern Municipal Water District, have been using recycled water to replenish groundwater basins but on a much smaller scale. ●

Source: Extract from 'Finding ways to make the most of a precious but limited resource' 21/3/09, By Douglas Quan, The Press-Enterprise, USA
Reach Douglas Quan at 951-368-9479 or
Email: dquan@PE.com
www.pe.com

Recycled water irrigating school playing fields

Environmental Improvement Plan (EIP) indicates recycled water is fit for the purpose of irrigating the playing field at Mount Lilydale Mercy College (MLMC).

The EIP completed by Arris Pty Ltd demonstrated that MLMC's use of Class B recycled water from Lilydale Sewage Treatment Plant (STP) will be consistent with the Victorian EPA's guidelines; and that it will be safe from both a human health and environmental sustainability perspective.

The EIP has helped assess the sustainability of using recycled water at MLMC and verified that the proposed practice of irrigating sports fields with recycled water can be done with acceptably low levels of risk to human health and the environment, from commissioning and into the future.

The college community was well aware of the need to consider alternative options for field irrigation, given the increasing demands on fresh water and the unsustainable situation of using mains water on college landscaping and sporting grounds. The potential for recycled water use was a possibility that Gerry Donovan, Property and Services Manager at the college, had been considering for some time.



School and community benefits from new playing fields.

Site feature	Description
Recycled water use and details	Irrigation of two sport fields
Total property area (Ha)	5 ha
Total area irrigated with recycled water (Ha)	Sports field 1 = 1.67 ha Sports field 2 = 0.61 ha Total = 2.28 ha
Maximum daily recycled water used (ML/day)	70,000 litres
Average annual recycled water used (ML/year)	5.6 ML/Year
Year that recycled water use/supply began	2008
Type of recycled water storage and lining	Steel Tank & Liner
Capacity of Storage (ML)	100,000 L
Method(s) of irrigation and other means of reuse	Overhead sprinklers on stands

According to Gerry, it made sense to consider the possibilities for recycling water from the treatment plant, given such close proximity to the playing fields – less than 200 metres. Overall, he said the whole process of initiating the EIP through to implementation of the recycled water supply to the grounds has been “fantastic”, noting the willingness of Yarra Valley Water to assist with the project and acknowledging that the project couldn't have gone ahead without the generosity of Arris in committing time and resources to the EIP as a way of

demonstrating the ways that smaller organisations can take on water recycling projects to enhance efficient resource use, simultaneously benefiting the wider community.

Prior to the EIP and water recycling initiative, water for the playing fields was accessed from the water mains; a situation increasingly unviable given rising water costs and increased restrictions. Use of the Class B recycled water enables the college to use up to 6 million litres of water per year, which is more than double the amount of water usage possible from water mains supply.

Twice as much water is now available for irrigation.

With twice as much water now available for irrigation, the fields receive more frequent irrigation which means greener ovals for more months of the year. Use of this recycled water allows the college to water two additional playing fields while also easing demand on precious mains supplies. Access to additional playing fields enables the college grounds to service the wider community through increased amenities. Local football and soccer teams access the fields for training and weekend competition, further increasing the value of the project to local groups.

Management controls required to minimise any risks identified are outlined in the EIP along with a maintenance review and audit process. Management controls included wind speed and direction monitoring and restrictions on irrigation times. The EIP also identified the roles and responsibilities of both MLMC and Yarra Valley Water (YVW) in managing the overall components of the recycled water scheme in compliance with the applicable standards and guidelines, so as to maintain the integrity and safety of the reuse scheme for now and into the future. ●

For more information contact:
Gerry Donovan
Phone: 03 9237 1372



MLMC sports carnival.

Recycling will provide 12% of Sydney's water needs by 2015

Sydney Water plans to recycle over 70 billion litres of water a year by 2015.

Recycling and re-use are crucial to diversifying Sydney's water sources. Using recycled water for non-drinking purposes such as for industry, irrigation and gardens is one of the four major parts of the Metropolitan Water Plan. It means that Sydney can reduce its reliance on rainfall, provide more water for river health and save its dam water for drinking purposes.

Reforms have made it easier for the private sector to participate in the water industry, encouraging innovation and attracting new investment in recycling.

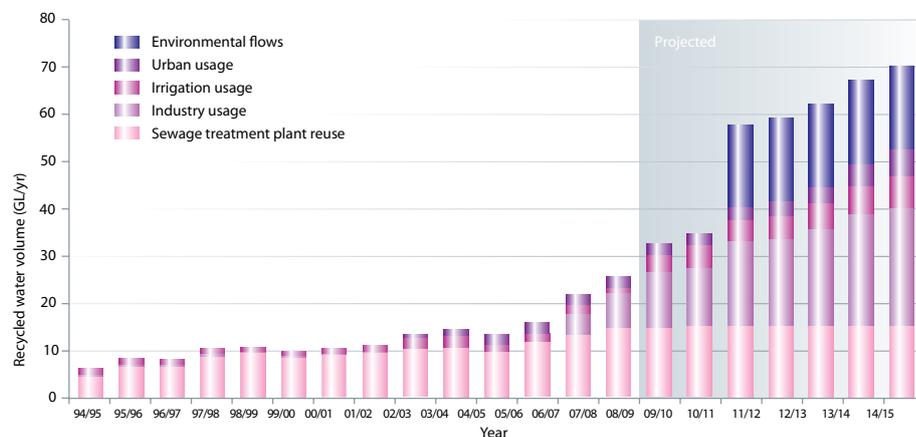
In 2008, greater Sydney used 25 billion litres of recycled water in industry, gardens and for irrigation. Plans to recycle over 70 billion litres of water (12% of Sydney's water needs) by 2015 and 100 billion litres a year by about 2032 are on track.

- Construction has begun on an advanced water treatment plant at St Marys to replace 18 billion litres of water a year currently released from Warragamba Dam each year.
- Sydney Water is expanding Australia's largest residential recycling scheme at Rouse Hill and building a similar system of dedicated recycled water pipes for Ropes Crossing and Hoxton Park. Construction has started on a new scheme in Campbelltown and Liverpool and a tender has closed for the early release precincts of the North West Growth Centre.
- An agreement has been signed with a private sector consortium to construct, own and operate a recycled water scheme to supply industries in the Rosehill and Camellia areas.
- Australia's first state-based access and licensing regime has been established under the Water Industry Competition Act 2006, making it easier for the private sector to invest in recycling.

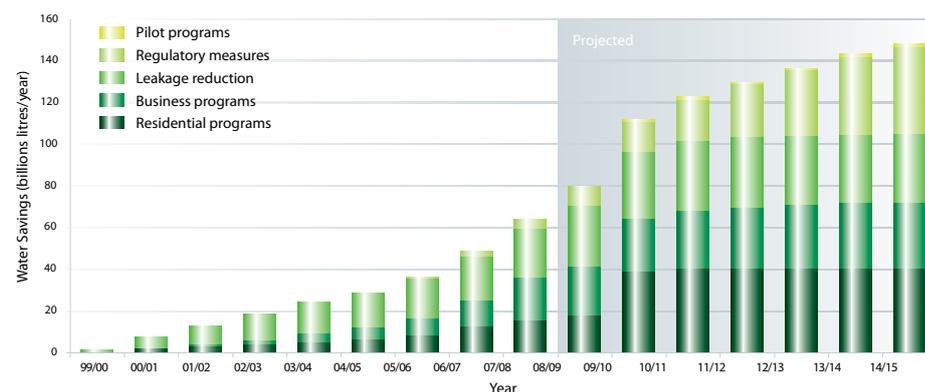
The large-scale recycling schemes that are built or planned for Sydney will provide recycled water to:

- homes - for flushing toilets, watering gardens and washing cars and clothes
- businesses and farms - for industrial processes and irrigation

Water Recycling - 12% by 2015



Water Efficiency - 24% by 2015



- rivers - to replace the raw drinking water currently released from Warragamba Dam for environmental purposes and for river-water users.

On a smaller scale, individuals are also contributing by recycling greywater from their shower or laundry. The Government has made it easier for individual homes

By about 2030 over 230,000 homes will be supplied with recycled water for toilet flushing, car washing and outdoor water use.

to take up water recycling by simplifying the approval process for household greywater diversion systems. Up to 30% of people surveyed have indicated that they now do this, either by installing greywater diversion devices or by simply catching their shower water in a bucket for later use in their gardens or for flushing the toilet.

What's next?

Work will continue to ensure Sydney Water meets the targets set out in the plan. This includes the water recycling target of 12% by 2015 and the water efficiency target of 24% by 2015. Progress to date and projections in these areas are shown in the graphs below.

During 2009, the Metropolitan Water Plan will be reviewed and revised to reflect government decisions since 2006 and the latest information, particularly on climate change. The revised plan will ensure that the most appropriate and effective solutions are in place to secure Sydney's water for the long term. ●

For more information see the full Metropolitan Water Plan report on: www.waterforlife.nsw.gov.au

Water controversies boil over

Illustrating the need to consider alternative water sources (Grey water)

Any doubt that California is hip-deep in an epic struggle for water was put to rest earlier this month when an estimated 10,000 farmers and farm workers marched 50 miles across the gasping San Joaquin Valley.

The goal was to heighten awareness about their water shortage, brought about by a third year of drought in California and environmental problems in the Sacramento-San Joaquin Delta. Their alliance is surprising, given a long history of acrimony between farm owners and labourers. It demonstrates the shifting alliances and simmering tensions that emerge when people fight over water.

We're likely to see more struggles over water, both locally and worldwide. The next big conflict in California is a proposal for a canal built around the Delta, designed to secure a water supply for Central Valley farms and Southern California cities while also improving the environment of the West Coast's largest estuary. Critics worry that it's simply a tool to drain the Sacramento River.

Preventing a water grab paradoxically requires us to set aside turf battles and focus instead on how the so-called peripheral canal will be managed. Who will be in charge of turning the water valves on and off? When and why? These questions, more than how much water is transferred south, hold the solution to managing future shortages.

In coming years, 46 nations risk violent conflict over water and climate-related crises, and 56 other countries face political instability, according to a study by International Alert, a British advocacy group. The United Nations says water wars may be more likely in the future than wars over oil.

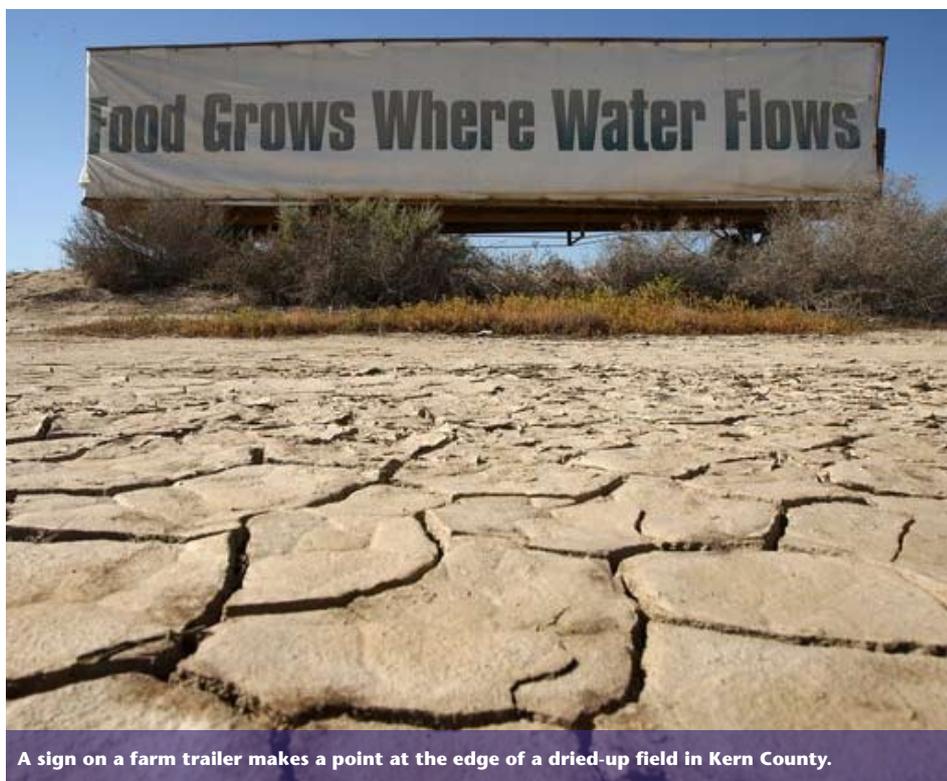
It's too simple to call this a water shortage problem. Shortage and conflict exist, at least in part, because of

numerous complex water management problems in California, where the seeds of mistrust have grown for decades.

Greywater is one example of how California doesn't do a good job of managing its water. Neighbouring states allow homeowners to use water from sinks, showers, bathtubs and washers to irrigate landscaping without special permits or regulations.

In California, however, you're breaking the law if you apply greywater to landscaping without a permit from your local health department or building inspector.

In California and worldwide, there reigns a cultural fixation that water is ours to use as we please.



A sign on a farm trailer makes a point at the edge of a dried-up field in Kern County.

Image: Sacramento Bee

The plumbing industry still views greywater as a sewage disposal issue. This outdated perspective appears to be dominating a process under way at the Department of Housing and Community Development to update greywater rules. As a result, it seems unlikely California will fully embrace greywater as a resource that could prevent wasting fresh water.

California could save 140,000 acre-feet of water - enough to serve 300,000 homes for a year - if just one in 10 households irrigated with greywater.

Another example: Half of California farmland is irrigated by flooding fields, according to the U.S. Geological Survey. It's a cheap

but crude practice that is increasingly difficult to justify in a dry state.

The Pacific Institute, a non-partisan research group in Oakland, estimates that shifting California farms to more efficient irrigation could save 5 million acre-feet of water annually. That's about equal to all the Delta water pumped in a typical year.

Solutions range from microsprinklers and drip irrigation to computerized soil sensors and weather triggers to deliver optimum supply for a given crop.

Mike Wade, executive director of the Cal-

ifornia Farm Water Coalition, attacked the Pacific Institute study, saying only farmers should decide how to use their water. But when pressed, he said water savings are possible if farmers had help and agreed with the Pacific Institute that tax credits would help farms adopt efficient irrigation.

In California and worldwide, there reigns a cultural fixation that water is ours to use as we please. Magnified across the globe, this notion breeds poor water management and conflict, whether in California or rural Ethiopia.

Kidanemariam Jembere, of the Ethiopian Country Water Partnership, has mediated water disputes in the headwaters of the Blue Nile, where conflicts have flared between families, religions, farmers and villages. Solving these conflicts, he says, requires us to accept that water doesn't belong to anyone. It belongs to all.

"We can use conflict as an opportunity to create partnership. That's my belief," Jembere said. "But we have a very big problem raising that issue of water as a shared resource." ●

Source: Matt Weiser; Sacramento Bee (Calif.) 27/4/2009
www.sacbee.com

Is recycled water part of the answer to climate change?

Options for aligning food production with reliable water supplies

Climate change represents a significant challenge for Australia. Many current efforts are aimed at reducing Australia's carbon emissions. However, adapting to the impact of climate change already experienced is more critical and immediate. The issues of future water and food security are crucial to Australia.

A paper presented at the recent Vegetables Conference in Melbourne highlighted some options for aligning the sources of food (vegetable) production with reliable water supplies. Utilising current data on available recycled water across Australia, water reticulation costs and climate data, future areas for development of Australian agriculture utilising recycled water were discussed.

Any engineered intervention of the natural water cycle to treat water so it is fit for the purpose required can be termed 'recycled water'. For example, water can be recycled from seawater, stormwater or wastewater via water reclamation plants. The engineered intervention (usually in the form of water treatment) comes with a capital cost (CAPEX) and operating cost (OPEX). Once the water is treated to be fit for the purpose it is required for (e.g. irrigation of vegetables) it needs to be reticulated from the source to end use. This reticulation system also comes with a CAPEX and OPEX cost. All these costs ultimately reflect the price of the water.

For any price of the water to be suitable, and sustainable, for food production the return to the producer from the produce grown with this water must provide a net benefit.

Water treatment costs are a function of water quality, in particular salinity and treatment costs are usually highest for desalination, lower for recycling water from effluent and lowest for naturally captured rainfall in surface or groundwaters. From a treatment perspective the cost of desalination of saline water is significantly higher than recycling water from wastewater (especially if salinity does not require removal). So the lower the salinity of the water the higher the intrinsic value as it can be used a number of times before the salinity increases to a level (from waste added or through concentration) where desalination is required.

Currently Australia recycles approximately 13% of the water in sewage effluent (Table 1) suggesting there are still opportunities to secure more of this water for horticultural operations near large cities where the effluent is produced. This paper discusses the barriers to these opportunities and predicts when some of these barriers may be lowered based on water pricing or water quality. In some cases, such as Adelaide, desalination of drinking water sources may lower the salinity of effluent below current levels, which may open up new opportunities for recycling and crops grown.

As water becomes more and more saline the types of crops that can be grown is more limited, increasing the economic risk to growers as they have reduced opportunity to respond to market pressures by changing to salt sensitive crops. The farming operation also becomes more

difficult to manage and the margins of error allowed smaller with respect to irrigation and soil management.

Recycling of water from seawater (desalination) may also become a viable option in the future for some farming operations as is currently the case in parts of Spain. These possibilities were discussed further at the conference along with technologies that can make the water go further growing more food per megalitre of water, such as drip irrigation or hydroponic systems. Any technology that improves water use efficiency can also potentially reduce the total salt applied when irrigating.

The recent presentation also discussed some higher level analysis of the recent climate change predictions over the next 50 years with respect to rainfall and temperature, and whether Australian agriculture will need to shift north. ●

Reference

WSAA, NWC (2009) National Performance Report 2007-2009. Water Services Association of Australia and National Water Commission, Canberra, ACT, Australia.
Daryl Stevens, Jim Kelly, Peter Makris and Simon Wilson (2009) (Arris Pty Ltd) *Is recycled water part of the answer to climate change?* Australian Vegetable Industry Conference, Melbourne, Australia. AusVeg Pty Ltd.

Currently Australia recycles approximately 13% of the water in sewage effluent.

Table 1: Effluent produced by sewage treatment plants and the portion of water recycled in states and territories of Australia

State	Effluent produced ML	Effluent recycled ML	Portion recycled %
Northern Territory	18448	1268	7%
Queensland	187957	23352	12%
Victoria	414675	95968	23%
Australian Capital Territory	37175	3845	10%
New South Wales	788731	49247	6%
South Australia	83332	25868	31%
Western Australia	140285	11395	8%
Tasmania	nd	nd	nd
Total	1670603	210943	13%

Source: WSAA and NWC 2009, nd = not determined

USA EPA western region recognizes 'Environmental Heroes'

US Environmental Protection Agency (EPA) Region 9 has named "Environmental Heroes" in Arizona, California, Hawaii/Pacific Islands, Nevada and tribal lands, according to EPA Region 9 Web news releases.

US EPA acting Regional Administrator Laura Yoshii is quoted as saying the recognised organisations and individuals "have made superb efforts to protect and preserve our air, water and land, and increased awareness of the environmental challenges we all face."

Environmental Heroes include:

- In Arizona, Rodney Glassman, Tucson councilman, and Tucson city staff were recognized for having passed the nation's first rainwater harvesting ordinance, as well as a greywater ordinance. According to EPA, the local laws are aimed at reducing the use of dwindling drinking water to irrigate desert landscapes.
- In California, Green Plumbers, Sacramento, was recognized for its goal to "change consumer behaviour by training plumbers to promote use of water-saving technologies and energy efficiency. ●

Source: US Environmental Protection Agency 21/4/2009
www.watertechnonline.com

Recycled water: how good should it be?

Focus on fit-for-purpose

Recycled water has become more accepted as water source for agricultural and horticultural production in the past decade. A number of schemes have been implemented that focus on the use of treated sewage effluent for irrigation of agricultural and horticultural crops, and other sources such as winery/dairy wastewater have been recycled for irrigation.

Quality guidelines

Traditionally, guidelines for the use of recycled water have focused on the human health aspects and have considered major contaminants such as microbial pathogens and chemical residues. Recycled water quality has been described in relation to the level of indicator pathogens in the treated water. For example, in Victoria *E. coli* is used as the indicator organism with objectives (org/100 mL) for the different classes as follows:

- Class A - <10 Class C - <100
- Class B - <100 Class D - <10,000

Other aspects considered for classification in the State-based standards include turbidity, BOD/SS, pH and chlorine residual.

Traditionally, lower class water (Class C) has been used in regional areas to irrigate pastures for dairy production. As well, over the past decade we have witnessed development of irrigation for amenity and production horticulture using Class A water. However, with dwindling water resources, increased competition for water in the last few years, and improved treatment processes the potential end users of recycled water have grown. As the water users have diversified, so have their requirements for a specific quality of water.

Fit-for-purpose quality

The Australian Guidelines for Water Recycling (www.recycledwater.com.au - guidelines menu) have tried to address this issue by focusing on fit-for-purpose quality of the recycled water. This approach implies that the quality of the recycled water is appropriate for its intended use and has moved away from the exclusive focus on health aspects. The guidelines (NRMCC and EPHC 2006) consider health and environmental components associated with using recycled water concentrating on particular parameters of concern.

The Australian guidelines have been through a risk assessment process and the

key environmental risks for agricultural irrigation using recycled water identified. The primary hazards identified are boron, cadmium, chloride, chlorine disinfection residuals, hydraulic loading, nitrogen, phosphorus, salinity and sodium (taken from NRMCC and EPHC 2006). These hazards generally align with major agronomic management issues for irrigation of horticultural crops using recycled water that have been identified - salinity (sodium and chloride), soil sodicity, nutrients (nitrogen and phosphorus) and managing algae in on-farm storage of the water.



While the Australian guidelines promote a fit-for-purpose approach, there continues to be confusion when determining the appropriate quality of water for a particular end use. This uncertainty arises for two key reasons:

- The states continue to regulate the use of recycled water for irrigation based on a Class A to D system, which focuses on the health aspects. While the Class system is valid for health parameters it is potentially misleading when considering quality parameters such as salinity (i.e. recycled water may be Class A but can be of poor quality for irrigation with high salinity levels).
- The Australian guidelines focus on health and environmental risks. However, there is limited understanding of the agronomic implications of irrigation with recycled water of varying quality and the practical application of the risk assessment approach.

To ensure the adoption of recycled water for irrigation of production and amenity horticulture and its sustainable use, a range of parameters need to be considered by the recycled water provider and the end user. Unfortunately, the objectives of the provider and end user are often vastly different so they will, understandably, focus their attention on

different parameters. For example, the greatest risks for the provider of the water are generally related to health, while the priority risks for the end-user are more likely related to production.

There have been a number of studies to explore the fit-for-purpose use of recycled water for the irrigation of production and amenity horticulture.

Vegetables. The key issues that have been identified are salinity, soil sodicity and nutrients (nitrogen and phosphorus). The significance of these parameters varies enormously depending on the soil type, the vegetable species, irrigation technology and management practices. The determination of fit-for-purpose will therefore vary from region to region based on the farming system in place and the salinity and nutrient levels of the source water.

Wine grapes. The major issues for irrigation using recycled water include salinity and nutrients. For high quality wine, it is critical that the water does not induce salinity stress or result in poor fruit quality from excess nutrient applications. Additional hazards such as potassium and bicarbonate will result in the water having an adverse impact on the resultant wine quality.

Amenity trees. Recycled water has been used to irrigate established trees in the Werribee Park Garden. The major risks identified with its use water are salinity and phosphorus. While the water appears to be appropriate for this use, there are concerns as to the long-term health of the trees due to salinity. Trees vary enormously in their tolerance to salinity, which needs to be considered on a species by species basis. There is currently limited reference data for salt tolerance for a range of amenity species.



Golf courses. Recycled water is used extensively to irrigate golf courses. The grass species and the soil used for greens and fairways vary greatly resulting in different requirements for quality of recycled water. Salinity levels of provided recycled water may

continued page 13

be appropriate for irrigating fairways but not for the more salt sensitive species grown on greens. The irrigator will need to consider management options such as shandying to ensure the water is fit-for-purpose in all instances.



The wash-up

The current regulation that is used in the states (Class A to D) can be misleading in the context of irrigation of amenity and production horticulture. This is an important issue because the use of recycled water for irrigation of horticulture is increasing. In addition, there is a need to more fully understand the impacts of parameters in recycled water on horticulture production. The following points highlight the major considerations for enhancing the use of recycled water for irrigation of horticulture:

- Providers and end users must fully understand the quality parameters of the water source (concentrations and variability). Class A does not necessarily mean that the water is good quality from the perspective of salts and nutrients.
- Providers and end users need to fully understand the sensitivity to specific parameters of the crop being irrigated considering species, farming system and management practices.
- To meet fit-for-purpose objectives, the water must be tailored to the needs of the end user from a health, environmental and agronomic perspective. Meeting these requirements may require additional treatment, increasing costs.
- Providers and end users need to undertake monitoring and manage the system accordingly.
- Providers and end users need to continuously communicate to understand each others' objectives, specific needs and their perspectives. ●

Source: Anne-Maree Boland* and Matt Shanahan RM Consulting Group. Phone: 03 9882 2670
*Anne-Maree is the coordinator for the Horticulture Water Initiative.

Note. The article was developed as the result of a workshop session on recycled water held at the RainBird Intelligent Use of Water Summit, held in Melbourne in March 2009.

Save water, build smarter

Weather-sensitive sprinklers controlled by satellites. Instant water heaters near every faucet. Low-flow toilets with pressurized flushing. And a WaterSense seal of approval from the US federal government.

Welcome to the home of the future.

While most builders retreat to their offices to wait out an economy gone awry, those still seeking building permits are discovering that projects can live or die based on the availability of water.

Several builders already have been forced to change plans: one showerhead instead of several, less grass and more drought-tolerant plants.

Next on the horizon: using recycled water to irrigate landscaping of new homes.

Such a move already is under way in eastern San Bernardino County, where the Yucaipa Valley Water District requires that all new homes be dual-plumbed so water recycled from a sewage treatment plant can be used to irrigate landscaping.

Fred Bell, president of the Building Industry Association's Coachella Valley chapter, said his group is encouraging members to be aggressive in making new developments use less water.

"There's no question that in the last four years, water as a factor in development has become a bigger issue," he said.

When California required low-flow showerheads in 1980, the nation followed up with the same standard in 1994.

The state will require even more efficient toilets and showerheads plus weather-based irrigation devices in new developments starting in 2011.

The tougher government regulations, more conservation-savvy consumers, and increased pressure on the state's water supply have continued to make homes more efficient since then, Bell said.

Builders are beginning to realize that water-efficient fixtures, appliances and landscaping are just as important as double-pane windows, good insulation and solar power when seeking approvals for their projects and marketing the homes, said Justin Dunning, director of the California Green Builder Program, which certifies homes that reduce energy and water consumption.

The program has certified about 2,000 new homes statewide since 2005.

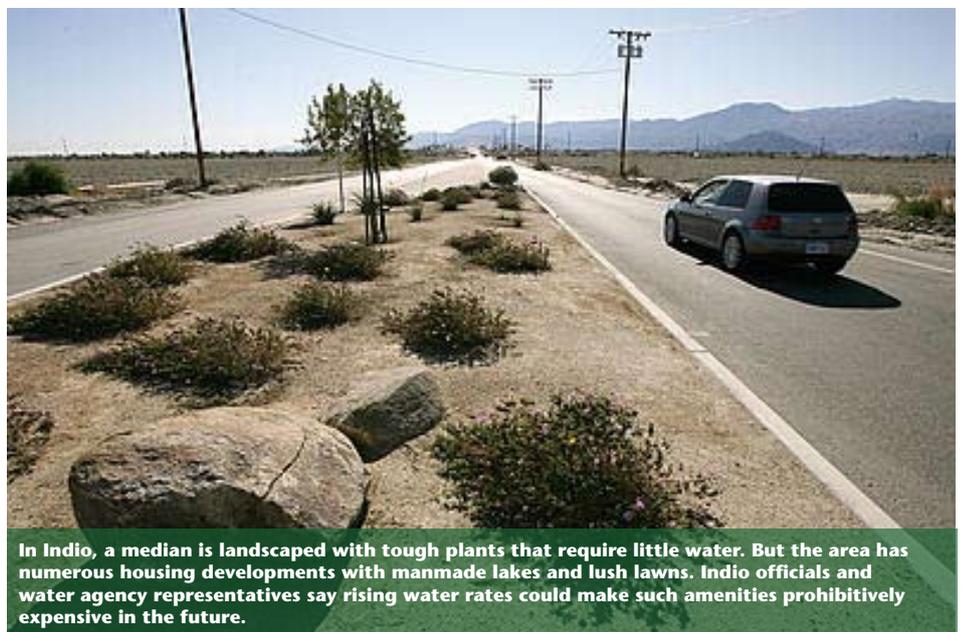
The aim is that each home will save 20,000 gallons of water annually with low-flow showerheads, water-efficient toilets, and irrigation systems that cut water consumption by an average of 25 percent compared to "nongreen" homes, he said.

A typical home uses 120,000 gallons of water a year.

Other builders are seeking the WaterSense label from the U.S. Environmental Protection Agency.

The program, similar to EnergyStar for appliances, certifies home products that reduce water use 20 percent -- more than 10,000 gallons a year -- compared to conventional products.

continued page 14



In Indio, a median is landscaped with tough plants that require little water. But the area has numerous housing developments with manmade lakes and lush lawns. Indio officials and water agency representatives say rising water rates could make such amenities prohibitively expensive in the future.

Image: The Press-Enterprise

from page 13

The changes include valves to reduce water pressure coming into the home, landscaping designed to meet a water budget, and systems that speed up hot-water delivery.

Whole-house WaterSense certification is expected to begin later this year.

Homebuyers will have to get used to showers with less water pressure and learn to love native plants rather than a lawn, said Joyce Mason, vice president of marketing at Los Angeles-based Pardee Homes, which uses WaterSense appliances in its projects.

"We're going to have to learn how to use less water," she said.

Artificial oases

The pressure on builders to conserve water is especially intense in desert areas, where groundwater has been overused and imported supplies are costly.

It wasn't always so, however, and lawns, waterfalls and man-made lakes are common in Palm Springs and other parts of the Coachella Valley.

In the mid-1990s, the developer of ShadowLake Estates in Indio built a 42-acre lagoon surrounded by homes.

"We did everything we could in our power to stop those developments," said Dennis Mahr, spokesman for the Coachella Valley Water District.

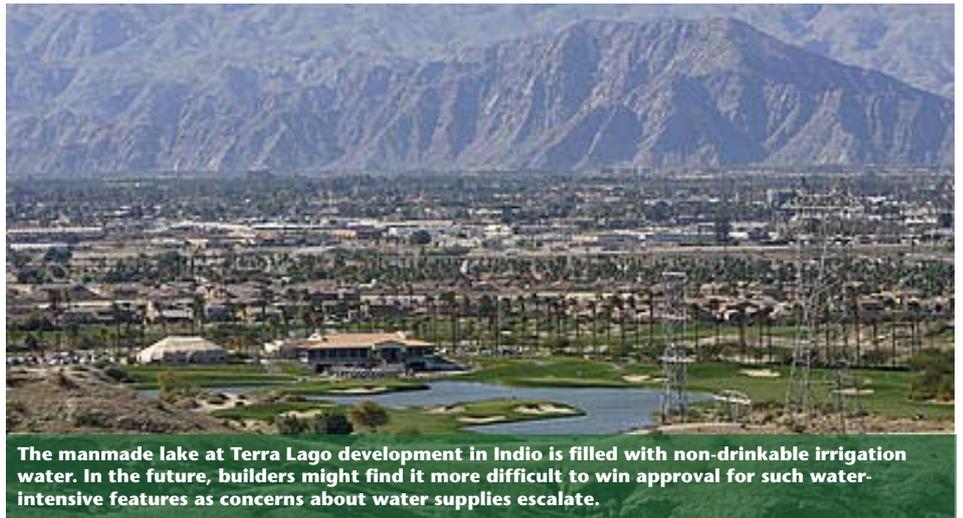
The water district sent a letter asking the state's Department of Water Resources to rule that using water for man-made lakes wasn't beneficial and shouldn't be allowed.

Water district officials said they never got a ruling because the state agency was short staffed at the time.

Indio approved ShadowLake Estates.

City officials today can't explain why their predecessors allowed it, but they point out that water features are important to a tourist destination that bills itself as an oasis in the desert.

Plus, landowners can drill wells and pump groundwater if local agencies don't cooperate.



The manmade lake at Terra Lago development in Indio is filled with non-drinkable irrigation water. In the future, builders might find it more difficult to win approval for such water-intensive features as concerns about water supplies escalate.

Rodrigo Peña / The Press-Enterprise

Indio and the water district hope that new rates, which will charge more to customers and developers who want lakes and lawns, will discourage water-intensive landscaping.

"If you do use water inefficiently for lakes or other water uses... you're going to pay dearly for it," said Gary Lewis, director of Indio's water department.

In 2004, the water district set limits on the amount of water any one development can have, meaning that if builders want a lake, they have to cut back on lawns.

In Indio, nearly 1,500 single-family homes surround a 20-acre lake at Terra Lago, built in 2005.

The lake has been filled and refilled with nondrinkable irrigation water from the All-American Canal, which ferries Colorado River water to the Coachella Valley.

Water from the lake's concrete basin is used to irrigate the development's golf course and lawns.

Since then, the district has tightened rules to address evaporation and weather patterns, he said.

"That has pretty well put large lakes under control, so we don't have to worry about them as much as we did before," Mahr said.

Water is an expensive part of doing business

The Coachella Valley's golf courses -- a draw for the area's No. 1 industry, tourism -- also are getting attention.

Of the valley's 112 golf courses, 15 are irrigated with water reclaimed from a sewage treatment plant.

In 10 years, the Coachella Valley Water District hopes to have enough pipelines and connectors in place to irrigate 50 with treated sewer water.

Mahr said golf course managers already are among the desert's most efficient water-users. It just makes financial sense.

"Water is an expensive part of doing business," Mahr said.

The water district is encouraging developers to be smart with their landscape designs in an area where 70 to 80 percent of the water supply irrigates lawns.

"We certainly don't preach rock and cactus," Mahr said, but "they don't have to have a heavy turf area to have a good-looking yard." ●

Source: Kimberly Pierceall at The Press-Enterprise
kpierceall@PE.com
Janet Zimmerman also contributed to this report

Water Industry Competition Act 2006

The NSW Government introduced the Water Industry Competition Act 2006 (WICA) as part of its strategy for a sustainable water future to harness the innovation and investment potential of the private sector in the water and wastewater industries. At the same time, the Act establishes a licensing regime for private sector entrants to ensure the continued protection of public health, consumers and the environment. A corporation (other than a public water utility) must now obtain a licence under the

Act to construct, maintain or operate any water industry infrastructure or to supply water (potable or non-potable) or provide sewerage services by means of any water industry infrastructure. ●

For more information on the licensing regime please go to www.ipart.nsw.gov.au/water and to Overview of Licensing regime under the Water Industry Competition Act 2006.

Source: www.waterdirectoriate.asn.au

16 EVENTS diary dates

Australia

Future Models for Energy & Water Management under a Regulated Environment

20-22 July 2009, Brisbane

Featuring short-courses, keynote lectures and contributed talks. Areas of interest include: pricing and network management; risks around the water-energy-climate nexus; economic implications, wind and geothermal energy (renewables), demand forecasting and integrated water resource management.

For more information see:
www.amsi.org.au



IWES Short courses for the water and related industries

20-24 July 2009, Gold Coast

Largest IWES program to date, with 25 courses in Wastewater & Potable Water Treatment; Membrane Systems; Stormwater & Groundwater; Air & Odour; Drinking Water Guidelines; Climate Change & Carbon Emissions. A Master Class in Potable Reuse is

also offered. Discounts apply for AWA Members and Free AWA Membership with Registration.

For more information
FREECALL 1800 000 404 or see:
www.iwes.com.au



Irrigation Efficiency Courses 2009.

8 & 9 September 2009, Adelaide, Brisbane, Melbourne, Perth, Sydney

This course provides training for three units of competency from the Certificate III in Irrigation: RTE3605A – troubleshoot irrigation systems; RTE3607A – measure irrigation delivery system performance; and RTE3611A – operate pressurised irrigation systems. The course trains people who are involved in operating or managing landscape irrigation systems to evaluate their systems for efficiency, adjust irrigation schedules if necessary, conduct basic maintenance on equipment and know when to get expert help.

Before enrolling make sure you read the Student Information.

Courses run on demand.

For information contact Catherine Parbery, IAL head office, phone 02 9476 0142, or visit www.irrigation.org.au



IWA Reuse 09 - Conference on Water Reclamation & Reuse

21-25 September 2009, Brisbane

In recent times, the coalescence of many different pressures - population growth, increasing urbanisation, drought, reduced run-off - has put a major strain on water supply infrastructure globally. The level of water abstraction is reaching its natural limits and this calls for a dramatic shift in our water utilisation concepts. The traditional "linear society" is not a sustainable solution and the "circular society" has to become the new standard.

The program will have a strong focus on the interaction between practice and research and will present excellent opportunities to share and exchange knowledge and expertise. You will also see first hand the largest water recycling scheme worldwide.

For more information see:
www.reuse09.org

Irrigation Australia Conference

18-21 October 2009, Swan Hill

Irrigation Australia Limited is now calling for conference papers for Irrigation Australia 2009. The conference theme is Irrigation Today: Meeting the Challenge with conference topics of particular relevance to horticulture including: irrigated industries outlook, water resources management, irrigation system modernization, competing water needs and urban irrigation.

For more information see:
www.irrigation.org.au



IWA Efficient 2009

25-28 October 2009, Sydney Convention & Exhibition Centre

The 5th IWA Specialist Conference on Efficient Use and Management of Urban Water

For more information see:
www.efficient2009.com



OzWater 2010

8-10 March 2009, Location TBA

You are invited to submit an abstract that presents a challenging and practical perspective on any of the conference themes. Themes are: Integrating Water Management; Making Sense of Water Policy Reform - the Last 10 Years and the Next; New Water Sources and Systems; Water and People; Water and Wastewater Systems and Processes. Submissions close 31 July 2009.

For more information see:
www.ozwater10.com.au

International



International
Water Association

6th IWA Leading Edge Conference on Water and Wastewater Technologies (LET Conference)

23-25 June 2009, Singapore

The 2009 edition of the LET conference will see its scope expand from its traditional focus on treatment technologies to include technologies that minimise the impact that the water sector has in climate change, resource recovery – such as water reuse and nutrient recovery – and advancements in nanotechnology.

IWA has teamed up with PUB, Singapore's national water agency, to co-locate the LET Conference at the Singapore International Water Week 2009 in Suntec Convention Centre, Singapore. (See details below) LET conference delegates can therefore look forward to enjoying greater networking opportunities with a diversified group of participants including top government officials and industry leaders, and benefiting from a wider spectrum of trade activities.

For more information see:
www.let2009.com.sg



Singapore International Water Week - Sustainable Cities – Infrastructure & Technologies for Water

22-26 June 2009, Suntec Convention Centre, Singapore

The goal for Singapore International Water Week is to provide policy makers, industry leaders, experts and practitioners with a new global platform to address challenges, showcase technologies, discover opportunities and celebrate achievements.

For more information see: www.siww.com.sg

World Water Week

16-22 August 2009, Stockholm, Sweden

Discounted early registration is now open. The second announcement contains a preliminary programme and description for the 2009 conference and the 90 workshops, seminars, high level plenaries, social events and prize activities taking place throughout the week.

www.worldwaterweek.org

3rd African Regional Conference.

11-17 October 2009, Abuja, Nigeria

Conference theme is The Role of Irrigation and Drainage in Food Security: towards attaining the millennium development goals in Africa.

For more information see: www.icid2009.org



3rd IWA Aspire Conference and Exhibition

18-29 October 2009, Taipei

The main theme of the 3rd IWA-ASPIRE Conference and Exhibition is "Working for Asia-Pacific Water Sustainability". Topics will cover the most recent innovations, successful practices in the treatment of water and wastewater systems, including in-depth case studies on safe and reliable systems for the removal of nutrients, reusable water, and methods of better operation.

For more information see: www.aspire2009.org

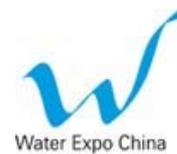


International Desalination Association (IDA) World Congress

7-12 November 2009, Atlantis Resort, The Palm, Dubai, UAE.

"Desalination for a Better World," 5 day technical program with more than 300 presentations and 4 specialised workshops featuring the latest in desalination and water reuse.

For more information see: www.idadesal.org



Water Expo China

18-20 November 2009, Beijing Exhibition Centre, Beijing, China

Water Expo China
中国水展

Supported by China's Ministry of Water Resources, the expo aims to provide networking opportunities and showcase the latest technologies for water treatment, conservation and environmental management applications.

For more information see: www.waterexpochina.com

Cleaner recycled water increases climate risk

Environmental catch-22 of recycled waste water

Improving the standard of recycled water threatens to push up Australia's greenhouse emissions, and governments must consider if better quality waste water can be justified under a low carbon future, water companies have warned.

In a report recently released, the Water Services Association of Australia (WSAA) — a national body representing water retailers — has highlighted the environmental catch-22 of recycled water, saying recent improvements to treatment standards "didn't adequately consider the impact on the water sector's greenhouse gas emissions".

The report said a four-fold increase in energy consumption had been experienced at water treatment plants forced to lift their filtration of sewage from "secondary" to "tertiary" standard.

Waste water can be recycled to different standards, and the lower standards — water suitable for sports fields — require less energy and create lower emissions than water recycled to tertiary standards, which can be used around the house for non-drinking purposes.

As Melbourne faces record water shortages, recycled water is increasingly being adopted for non-drinking purposes. Melbourne recycles more of its waste water than any Australian city, yet still pumps most waste water out to sea. Despite the warnings over emissions, most experts still consider recycling waste water to be less greenhouse and energy-intensive than desalinating sea water. Melbourne is expected to be drinking desalinated sea water from Wonthaggi by late 2011.



Aerators at Werribee Treatment Plant.

The WSAA report said cities would move away from sending all waste water to one or two large treatment plants, and instead were likely to have several small, local facilities for recycling water. Almost all Melbourne's waste is treated at two large plants — Werribee on the city's western fringe, and Carrum in the south-east. WSAA said it was "imperative" that recycled water should be supplied without the need for long pipelines and large-scale pumping. ●

Source: The Age 25/5/2009
www.theage.com.au

National

Launch of a new water industry organisation

At the recent OzWater 09 conference a new water industry organisation, Water Australia, was launched. Water Australia will operate under the umbrella of the Australian Water Association. Its main role will be the provision of a framework to drive water industry growth nationally and globally.

Source: HWI Water News March 2009
www.awa.asn.au

'Water for Future' funding

The Federal Government is calling for proposals for stormwater harvesting and re-use projects under a new \$200 million initiative. The initiative, part of the Water for the Future package, was negotiated between the Rudd Government and Senator Xenophon as part of the passage of the Nation Building and Jobs Plan through the Senate last month.

Source: AWA Water E-News 30/3/2009
Minister for Climate Change and Water
www.environment.gov.au

National Performance Reports

The National Water Commission has released the National Performance Reports for the urban and rural water sectors, which provide detail on indicators such as residential water supplied, recycled water and capital expenditure. The report shows urban water utilities have boosted their investment in infrastructure by 41% and increased wastewater recycling by 6%, while over the same period the average urban Australian used 12% less water.

Source: AWA Water E-News 6/4/2009
(See **Good Reads** and the article in this edition of **ReWater**, page 4 for more information)

EPHC Endorse Stormwater, Aquifer Guidelines

The Environment Protection and Heritage Council (EPHC) has released a *Communiqué* (22 May 2009) in relation to the 18th EPHC meeting held in Hobart. Amongst other items, the EPHC discussed and endorsed the national guidelines for water recycling including for *Managed Aquifer Recharge* and *Stormwater Harvesting and Re-Use* (both dated May 2008), which provide water supply managers with "expert guidance on what water can be captured and used to supplement existing water sources". The guidelines are currently being considered for endorsement by the National Health and Medical Research Council and are the final modules of Phase Two of the Australian Guidelines for Water

Recycling. The EPHC also initiated the development of national guidelines for the management of drought-triggered Acid Sulfate Soils in inland fresh water wetlands.

Source: EPHC 22/5/2009

Water Footprint Network

CSIRO has joined the Water Footprint Network, which seeks to advance the concept of 'water footprinting' as a means of understanding and addressing the negative impacts on freshwater systems of the production and consumption of goods and services. CSIRO has conducted a range of water footprint case studies on various products - including food products - and has been active in developing water footprint calculation methods.

Source: AWA Water E-News 4/5/2009
www.csiro.au

Biogas from wastewater

Water Services Association of Australia executive director Ross Young said there has been a major shift in thinking towards using biogas from waste water as fuel in power production.

Source: AWA Water E-News 4/5/2009
www.news.com.au

South Australia

Security projects get underway

SA Water is in discussions with over 30 schools, businesses and councils wanting to tap into the Glenelg-Adelaide recycled water pipeline by laying pipes water parks and reserves. The \$75 million pipeline will move almost four gigalitres of water annually out of the Glenelg sewage treatment works.

Source: AWA Water E-News 6/4/2009
www.abc.net.au

Stormwater capture study: Adelaide airport

Water Minister Karlene Maywald has announced that the state government, through SA Water and Adelaide Airport Limited, will jointly conduct a \$60,000 feasibility study to investigate the potential of harvesting and storing stormwater at the airport site. Ms Maywald advised that the feasibility study will investigate stormwater treatment options and aquifer storage capacity at the airport, with completion of the project expected in April 2009.

Source: SAI Global Water Newsfeed 17/3/2009
www.premier.sa.gov.au

User-pays water pricing

User-pays water pricing is one of the key elements of a new economic blueprint for SA according to a statement prepared by the Economic Development Board. It has recommended user-pay increases in the price of water and that private suppliers be given access to South Australia's water and sewerage networks. The report also says failing to invest in infrastructure now would be far more damaging for the state than a downgrade in its AAA credit rating.

Source: AWA Water E-News 23/3/2009
www.news.com.au

Salisbury council's pipe dream

The Advertiser reports that Salisbury Council is investigating a \$70 million stormwater project that would supply about 50,000 homes and businesses in the region. The project reportedly involves the laying of "740km of piping across the district to link recycled stormwater from wetlands... enabling residents to link up to the system and use the water on their gardens and in their homes for washing and flushing their toilets".

Source: SAI Global Water Newsfeed 24/3/2009
www.news.com.au

Urban stormwater management information

The South Australian Murray-Darling Basin Natural Resources Management Board (SA MDB NRM Board) has updated its web content to provide information on Urban Stormwater Management.

Source: SAI Global Water Newsfeed 7/4/2009
www.samdbnrm.sa.gov.au

Streaky Bay desal plant touted

ABC News reports that the Eyre Regional Development Board (ERDB) is investigating the potential construction of a desalination plant on the state's west coast, claiming that the resource is needed for mining companies to operate. ERDB chief executive Mark Cant reportedly stated that the board was looking at options from Streaky Bay to about 60 kilometres north of Ceduna. Mr Cant reportedly opined that the Kaolin mine east of Streaky Bay cannot operate without water; therefore the development of a desalination plant would secure employment in the region.

Source: SAI Global Water Newsfeed 7/4/2009
ABC News: Board pursues desal plant options (8 May 2009)

Victoria

Price increases in water and sewerage bills

Victoria's Essential Services Commission has suggested increases of between 48 and 60 per cent in water and sewerage bills for Melbourne households over the next four years. These proposed cost increases are expected to cover the expected costs involved in delivering water and sewerage services, capital works programs and the levels of service promised to customers.

Source: AWA Water E-News 27/4/2009
Essential Services Commission
www.esc.vic.gov.au

Water use and affordability

The latest Essential Services Commission report on water USE and AFFORDABILITY in Victoria shows that average urban household use fell by 18 kilolitres and average regional household use fell by 31 kilolitres in 2007-08. Water prices are rising and will continue to do so in future years with average bills ranging from \$436 to \$718 per household.

Source AWA Water E-News 30/3/2009
Essential Services Commission
www.esc.vic.gov.au

Smart Water Fund projects

Twenty one water conservation projects across Victoria have been earmarked for a share of \$5 million in funding through Round 6 of the Smart Water Fund. The fund provides funding for innovative water conservation, water recycling and biosolids management initiatives to individuals, community groups, businesses and research bodies in metropolitan and regional urban Victoria.

Source: [www.premier.vic.gov.au/minister-for-water/another-\\$5-million-investment-in-smart-water-savings.html](http://www.premier.vic.gov.au/minister-for-water/another-$5-million-investment-in-smart-water-savings.html)

Praise for residential recycling

Planning Minister Justin Madden has congratulated Yarra Valley Water and VicUrban for their efforts to roll-out recycled water to the VicUrban's Aurora residential development. With 25,000 residents expected to live in the development, Mr Madden stated "that the delivery of Class A recycled water to the 1000 residents already living at the estate would reduce the consumption of drinking water by up to one third compared to the average Melbourne household".

Source: SAI Global Water Newsfeed 31/3/2009
Media Release Victorian Premiers Office
www.premier.vic.gov.au

Class C recycled water saving drinking water

South East Water will be connecting three sporting reserves, Ballam Park, Lloyd Park and Jubilee Park, to Class C recycled water next year, which is expected to save 47 million litres per year of drinking water.

Source: South East Water

Housing estate accesses Class A recycled water

Water Minister Holding turned on the tap to Villawood Properties' Marriott Waters residential development where almost 100 homes including 50 display homes, can now access Class A recycled water.

Source: AWA Water E-News 23/3/2009
Media Release Victorian Premiers Office
www.premier.vic.gov.au

Tasmania

Increased water and sewerage costs outlined

Tasmanians could pay up to \$200 more over the next three years for water and sewerage charges from July. The likely costs are outlined by the Tasmanian Water and Sewerage Economic Regulator in a report released by the State Government.

Source: AWA Water E-News 20/4/2009
Office of the Tasmanian Economic Regulator
www.gpoc.tas.gov.au

New South Wales

Increasing public confidence in recycled water

Technology that uses fluorescence to pick up trace sewage contamination may help increase public confidence in recycled water, according to new research from the University of New South Wales Water Research Centre. Dr Rita Henderson of the University of New South Wales reportedly stated that the use of "fluorescence spectroscopy" would provide a highly sensitive and selective detector of contamination events in recycled water systems.

Source: AWA Water E-News 20/4/2009
www.abc.net.au

Odour management guidelines

The Water Directorate has made available the Odour Management Guidelines (available for purchase), which provide "an overview of the options, techniques and technologies available to sewerage

facility operators to mitigate the release of odours from sewerage facilities and the procedures and options available to demonstrate compliance with odour Regulations to Authorities and neighbours of a facility".

Source: SAI Global Water Newsfeed 7/4/2009
Order Form: www.waterdirectorat.asn.au

New recycled water plant for West Sydney

Veolia Water has been issued with the first licence under the Water Industry Competition Act 2006 No. 104 (NSW) allowing them to construct, maintain and operate a new recycled water plant at Fairfield. The new plant will be part of the Rosehill Recycling Scheme that will provide recycled water to industrial and irrigation customers in Western Sydney. A second licence has been issued to Aquanet Sydney, to allow the recycled water to be transported to users through a network of retrofitted gas pipes. Sydney Turf Club and the Shell refinery at Clyde are earmarked as the first large industrial customers to receive the recycled water. The project is expected to attract \$100 million of private sector investment and create 64 construction jobs.

Source: SAI Global Water Newsfeed 13/5/2009
Premier's media release (7 May 2009) & www.abc.net.au

Stormwater harvesting scheme launched

ABC News reports that a \$5 million stormwater harvesting scheme has commenced in Orange. Reportedly, once the water has undergone testing it will be added to one of the city's water storage dams. Orange Council director of technical services Chris Devitt reportedly claimed that raw stormwater "is not of a dissimilar quality to what actually flows into our storage dams".

Source: SAI Global Water Newsfeed 24/4/2009
www.abc.net.au

Political stupidity and hydrocommerce madness

In a country where water is becoming more scarce, has the NSW Government properly explained its water legislation? Water is a unique public commodity, but the New South Wales Government is opening the Sydney and Hunter water markets to multinational privateers. Lawyer Kellie Tranter reports for ABC on recent activity.

Source: www.abc.net.au

Australian Capital Territory

Ponds save potable water sources

Water Minister Simon Corbell has announced that the state government has allocated \$13.9 million towards the fast-tracking of projects that will replace storm water drains with wetland pond developments and consequently reduce demand on the ACT's potable water supplies. Mr Corbell explained that the funding would facilitate the construction of ponds in Dickson and Lyneham that will provide secure non-potable water sources for use in the irrigation of local parks, ovals and open green spaces.

Source: SAI Global Water Newsfeed
13/5/2009

Water Minister's media release
(5 May 2009)

Queensland

Gold Coast desalination plant operational

The Queensland Water Commission (QWC) has advised that the Gold Coast's Tugun seawater desalination plant has begun operations at 33% capacity producing more than 40 million litres per day, with all testing indicating that the water meets Australian Drinking Water Guidelines. QWC explained that, "while most Gold Coast suburbs will continue to receive water supplied from the Hinze and Little Nerang dams, some suburbs will receive a blend of dam and desalinated water from the Tugun plant".

Source: Queensland Water Commission
26/3/2009

www.qwc.qld.gov.au

Scenic Rim Pipes recycled water to farms

The Scenic Rim Regional Council has approved the first stage of a project that will pipe recycled water from the Beaudesert sewage treatment plant to local farms.

Source: SAI Global Water Newsfeed
3/3/2009

Scenic Rim Regional Council's media release (24 February 2009)

www.scenicrim.qld.gov.au

Western Australia

Water Forever draft plan

WA's Water Corporation has released its draft plan to address the challenge of providing sustainable water services to 2060. 'Water Forever: Directions for Our Water Future' proposes a portfolio of over 700 billion litres of water demand and supply options. The plan proposes that over the next 20 years, West Australians become 15 per cent more water efficient, recycle up to 30 per cent of all wastewater in the metropolitan area and develop up to 100 billion litres of new water sources.

Source: AWA Water E-News 9/3/2009
www.watercorporation.com.au

ERA: recycled water pricing final report

The Economic Regulation Authority (ERA) has announced the release of the final report on its Inquiry into Pricing of Recycled Water in Western Australia (6 February 2009). The ERA's chairman Lyndon Rowe stated "that the report contained a set of pricing principles that could be used to gain access to wastewater from the Water Corporation's wastewater treatment plants". The ERA has "concluded that if a level playing field existed for access to the wastewater resource then, generally, there would be no need to regulate the Water Corporation's charges for recycled water. However, where recycled water customers do not have a choice of water sources, some regulation of price could be warranted".

Source: SAI Global Water Newsfeed
11/3/2009

Final report: www.era.wa.gov.au

International

California applies recycled water policy

The National Water Research Institute (NWRI) reports that California's State Water Resources Control Board has adopted a state-wide Recycled Water Policy to establish uniform requirements for the use of recycled water. The Board reportedly stated that recycled water is considered "safe for approved uses and as a safe alternative to potable water for such approved uses", and that the purpose of the new policy is to increase the use of recycled water from municipal wastewater sources.

Source: SAI Global Water Newsfeed
17/3/2009

www.nwri-usa.org

Singapore's sewerage superhighway

European Water News reports that Singapore's Deep Tunnel Sewerage System (DTSS) has won the "Water Project of the Year" award at the Global Water Awards 2009 in Zurich. The DTSS was reportedly selected as the water project with the most significant contribution to water technology and environmental protection. The "mammoth" USD3.65 billion project is reportedly touted as being Singapore's "superhighway" designed to meet its used water needs for the next 100 years. It reportedly "conveys used water from homes and industries through a 48-km long deep tunnel sewer that runs 20 to 55 metres below ground to a centralised water reclamation plant for treatment".

Source: SAI Global Water Newsfeed
29/4/2009

<http://european-waternews.com>

US and Oz collaborate on water and wastewater research

The US based Water Environment Research Foundation (WERF) has announced that leading US water and wastewater research organisations and Australia's Water Services Association of Australia (WSAA) have signed a three-year agreement to commit to co-operatively fund projects and the share research.

Source: SAI Global Water Newsfeed
13/5/2009

WERF's media release (4 May 2009)