

WSAA Innovative solutions
from the Australian
Urban Water Industry

A SERIES OF CONTEMPORARY CASE STUDIES



WATER SERVICES
ASSOCIATION OF AUSTRALIA

CONTENTS	> 01 Message from the WSAA Chair	> 07 Melbourne Water (VIC)
	> 02 Introduction from the WSAA Executive Director	> 08 SA Water (SA)
	> 03 About WSAA	> 09 ACTEW Water (ACT)
	> 04 Gladstone Area Water Board (QLD)	> 10 Power and Water Corporation (NT)
	> 05 Sydney Water (NSW)	> 11 Southern Water (TAS)
	> 06 Water Corporation (WA)	> 12 Acknowledgements and thanks

MESSAGE FROM THE WSAA CHAIR



Urban water is an essential service. Our customers trust us to efficiently deliver clean healthy water and to safely dispose and treat wastewater. The Australian urban water industry has an excellent track record of delivering these services. In this publication the industry showcases leading edge innovations and aspects of our activities that are less publicised, less visible and in some cases less expected. These case studies are not the only examples of innovation in the urban water industry, in fact there are far too many to include in one publication.

Innovation entails stepping away from an issue or situation, looking at it from a different viewpoint and reaching a solution that breaks new ground. Here are eight examples, one from every state and territory in Australia, of innovation at work. The issues were different; some are local, some national, and some international. They address situations brought about by a range of factors, such as new economic and regulatory situations, climatic change, a growing population, ecosystem protection and increased community engagement. Ultimately these case studies demonstrate the critical role urban water services play in the economic prosperity of Australia.

This publication features an industry that sees opportunities in its challenges and is prepared to back new and exciting ways to reach solutions. I think it will dispel some of the old perceptions of urban water utilities and demonstrate what I already knew, that we are a progressive and innovative industry, focused on delivering affordable services to our customers.

Sue Murphy

WSAA Chair, Chief Executive Officer, Water Corporation



ADAM LOVELL WSAA EXECUTIVE DIRECTOR

INTRODUCTION

Recent research found that the public perceives urban water utilities as old style but respected, slow to change and not innovative. This publication sets out to explode those perceptions and presents a series of innovative case studies taken from all states and territories of Australia. These case studies demonstrate how water utilities are approaching, resolving and actioning solutions to changing conditions.

Innovation represents many things but in the context of this publication it is a signal of directional change for a whole industry. The large infrastructure projects that were necessary through the years of low rainfall have largely been completed. At WSAA we often find ourselves having to defend the decisions made to widen our water supply options, and it is refreshing to now talk about the inventive and ground breaking initiatives that the urban water industry has undertaken recently. We wanted to demonstrate what a vital and dynamic urban water industry we have in Australia

As an industry we are always examining how we can do things in a better way, make more use of our existing resources and deliver the best

outcome at the lowest cost for our customers and our regulators. As the industry's peak body we take a national viewpoint and it was remarkably easy to identify case studies from every part of Australia. The cooperation and enthusiasm of our members, when we asked their help in compiling this publication, was outstanding.

These case studies have a strong theme: The role of urban water in underpinning Australia's economy. From supporting major export industry in Queensland to preparing for carbon pricing and improving services to indigenous communities, our industry reaches every corner of Australian society and makes a substantial contribution to its wellbeing.

Innovation is also a key part of the WSAA mission and by producing this publication the Association is playing its part in changing perceptions to the reality that these case studies exemplify.

Adam Lovell
WSAA Executive Director



Vision Valued Water Solutions for a Better Future

Mission WSAA will advocate, collaborate and innovate to deliver value for its members

ABOUT WATER SERVICES ASSOCIATION OF AUSTRALIA (WSAA)

WSAA is the peak industry body that brings together and supports the Australian urban water industry. WSAA Members are Government regulated water utilities that provide water and sewerage services to over 16 million Australians and many of Australia's largest industries and commercial enterprises.

ADVOCATE WSAA acts on behalf of all Members, providing a strong, national voice for the sector and taking a leading role in influencing urban water policy development.

COLLABORATE WSAA supports members in their engagement with customers, stakeholders and the community. WSAA Member networks meet to discuss common issues and express concerns, as well as share information, research findings and developments.

INNOVATE WSAA is proud of the attitude and willingness of members to innovate and always seek smarter ways of doing things.

DELIVERING VALUE FOR MEMBERS WSAA has three Board Committees chaired by a Board Member. Each Committee focuses on a specific area of mutual interest to Members and oversees its own network groups and projects.

“Innovation represents many things but in the context of this publication it is a signal of directional change for a whole industry.”



GLADSTONE AREA WATER BOARD (GAWB) – QUEENSLAND HOW A WATER COMPANY SUPPORTS A BOOMING AUSTRALIAN EXPORT INDUSTRY

:04

GAWB is the bulk water supplier to the Gladstone Region supplying major industry and Gladstone Regional Council. The Gladstone region is a major economic and industrial hub. This case study demonstrates an urban water project that is adding to Australia's export industry while providing significant benefits for the environment and local community.

Curtis Island Pipeline Project

Three Liquefied Natural Gas (LNG) production facilities and a potential fourth facility on Curtis Island required a water service. The best solution was a pipeline extension to GAWB's distribution network with the only other option being individual desalination plants at each of the LNG production facilities. The desalination option would have entailed discharge of brine into Gladstone Harbour which would have impacted further on the local community who were already feeling the impact of the LNG facilities development and other industry expansion currently underway in the region.

The combined value of the LNG projects totals \$45 billion and provides for a combined production capacity output of 25.3 million tonnes per annum, providing significant economic benefit to Australia. The Foundation Proponent requested a water supply solution to be in place by February 2012. Given these factors, the construction program was designed to allow for an interim water supply solution to be provided prior to construction being complete.

Despite the compressed construction timeframe, the work being undertaken on the mainland and on Curtis Island was standard from a design and construction perspective. The success of the entire project however depended on the HDD crossing of Gladstone Harbour – three bore holes in total.

There were two main challenges faced with the HDD: there was limited geotechnical information on the proposed route (some 60 metres under Gladstone Harbour); and the length of the HDD crossing at 2.12 km was at the outer edge of technical feasibility. The pilot hole for the first bore hole successfully crossed Gladstone Harbour in December 2011 with only one area of 'soft material' identified. This information was used to better facilitate the crossings for holes two and three. The HDD bore holes were made using the 'intersect method' with drilling occurring from both the mainland and Curtis Island simultaneously. A 'Gyro' was also used to ensure the drill remained on the desired course.

The project was undertaken in conjunction with Gladstone Regional Council (GRC) who is responsible for wastewater services throughout the region. This joint approach has provided significant benefits through undertaking joint procurement, co-location of infrastructure, single approvals process, project team resourcing and economies generated from a joint operations and maintenance approach. The project has also had less of a 'footprint' on the local community than it would otherwise have had. Both the LNG proponents and GAWB's existing customers benefit through better utilisation of existing infrastructure.

The initial feasibility into the project commenced in July 2010, the Concept Design phase was completed in May 2011. Practical completion of final water supply services is expected to be completed by the end of September 2012, with access roads and construction completed by the end of December 2012. The current forecast cost for the water supply services portion of the project is \$52.5M.



SYDNEY WATER – (NEW SOUTH WALES) PARTNERSHIP ARRANGEMENT SUPPLYING RECYCLED WATER AND SAVING DRINKING WATER

Sydney Water is a statutory corporation, wholly owned by the New South Wales Government and provides drinking water, recycled water, wastewater services and some stormwater services to more than four million people in Sydney, the Illawarra and the Blue Mountains. The \$100 million Rosehill Recycled Water Scheme is the first public-private partnership to deliver high quality recycled water to customers in NSW under the NSW Government's Water Industry Competition Act (WICA) 2006. Given Sydney's highly variable rainfall, schemes like this will be an integral part of ensuring the water supply for Sydney Water's customers for generations to come.

The Rosehill Recycled Water Scheme

The NSW Government aims to increase the amount of water recycled in Sydney to 70 billion litres a year by 2015. The Rosehill Recycled Water Scheme is one of the water recycling projects under the NSW Government's Metropolitan Water Plan and supports this commitment by encouraging industrial and irrigation customers to use recycled water instead of drinking water. The first scheme to be delivered by the private sector under the NSW Water Industry Competition Act (WICA) 2006, it also supports the government's commitment to encouraging private sector participation in the water industry, which brings innovation and efficiency benefits.

AquaNet Sydney and Veolia Water obtained the required licences to operate the scheme under WICA. The scheme is capable of supplying more than three billion litres of recycled water a year to six foundation customers in the Rosehill and Smithfield areas in Western Sydney. AquaNet Sydney provides the recycled water to Sydney Water under a 20 year agreement. Secondary treated wastewater

is extracted from Sydney Water's Liverpool to Ashfield Pipeline and is treated further by ultrafiltration and reverse osmosis at the Fairfield Recycled Water Plant. This high quality recycled water is used in cooling towers, boilers and some manufacturing processes, as well as for irrigation and firefighting.

AquaNet Sydney (part of the Jemena Group), in partnership with Veolia Water, designed and constructed the scheme, which includes the water recycling plant, two pumping stations, three reservoirs and 20 kilometres of pipelines. AquaNet Sydney built and owns the pipelines and operates the recycled water supply network. The Fairfield Recycled Water Plant was designed and built and is owned and operated by Veolia Water. Sydney Water provides the secondary treated wastewater to the Fairfield plant, and then purchases the high grade recycled water from AquaNet Sydney to sell it to the six foundation customers, who have recycled water supply agreements with Sydney Water. AquaNet Sydney will retail recycled water directly to future customers. Construction started in June 2009 and the scheme began operating in October 2011.

The Rosehill Recycled Water Scheme has been designed with future demand in mind, and has the potential to supply a further four billion litres of recycled water a year. Once expanded, the scheme will provide just over 7 billion litres of recycled water to commercial customers in western Sydney.

Recycled water saves large amounts of drinking water and is a reliable, alternative water supply for irrigation and industrial processes. By encouraging customers to use recycled water instead of drinking water, this scheme contributes to a sustainable water supply for the future.



WATER CORPORATION – WESTERN AUSTRALIA TRIAL USES RECYCLED WATER TO REPLENISH GROUNDWATER

Water Corporation is the principal supplier of water, sewerage and drainage services in Western Australia. Water Corporation's services, projects and activities span over 2.5 million square kilometers. As a part of its proactive response to a drying climate which has seriously depleted Perth's water resources, Water Corporation began the three year Groundwater Replenishment Trial (GWRT) in 2010. Groundwater replenishment is an innovative concept in water conservation where recycled water is treated to drinking water standards and recharged back into a deep confined aquifer where it is stored for later use.

Perth's Groundwater Replenishment Trial

Water Corporation is moving away from traditional water sources, and groundwater replenishment is one of the portfolios of options they are considering. Groundwater replenishment has the potential to recycle large volumes of water and maintain groundwater levels during low rainfall periods and is more energy efficient than other climate independent sources such as desalination. The methodology is used successfully overseas in countries like the US and Singapore, but this trial tests it in local conditions.

An Interagency Working Group (IAWG) was established to be responsible for the development of policy and regulation of groundwater replenishment in Western Australia. The agencies working with Water Corporation are Department of Health (DoH) for public health; Department of Water (DoW) for protecting water resources; and Department of Environment and Conservation (DEC) for protecting the environment. CSIRO, ChemCentre, and Curtin University are also involved to ensure the

trial meets rigorous health and environmental requirements. Design commenced in 2008 using international expertise in advanced water treatment processes and membrane technology and is scheduled to conclude in December 2012.

In full operation groundwater replenishment could supply around 140,000 households with drinking water each year. By 2060 it could account for up to 20% of WA's total yearly drinking supply allowing expensive new water supply developments to be postponed and play a key role in the Water Corporation's plan for securing sustainable groundwater supplies. This plan also includes transferring groundwater abstraction to the deeper aquifer to protect the groundwater environment.

The objectives of the trial are to confirm that treatment technologies can consistently meet stringent water quality guidelines, to develop policy and regulation and to allow open dialogue with the community about groundwater replenishment as a water source. Community acceptance of the trial proceeding to full production has been maintained at 70 per cent, the Visitor Centre has had over 5800 visitors since late 2010. The IAWG meet quarterly to review data and assess progress against the trial's policy and regulatory objectives. Progress so far has been very good with the aquifer responding to recharge well with no adverse reactions, supporting the predictions of the groundwater modelling.

When the Trial is complete, Water Corporation and its Regulators will assess whether groundwater replenishment can be a sustainable water option for Western Australia.



MELBOURNE WATER – VICTORIA

ELECTRICITY FROM TREATMENT BY-PRODUCTS REDUCING OPERATING EXPENSES AND GREENHOUSE GAS EMISSIONS

Melbourne Water is responsible for Melbourne's water supply catchments, treats and supplies drinking water, removes and treats most of Melbourne's sewage, provides recycled water for non-drinking purposes, and manages rivers and creeks and major drainage systems. This case study describes how Melbourne Water is using a by-product of the sewage treated at its Western Treatment Plant (WTP) in Werribee to produce electricity.

Generating on-site electricity from biogas

Biogas, mainly methane, is a by-product of sewage treatment. Biogas generation was first installed by Melbourne Water at its Western Treatment Plant (WTP) in the mid-1990s and several expansions have occurred since. The biogas power plant is a critical part of Melbourne Water's goal of achieving zero net greenhouse gas emissions by 2018.

Power is generated at the plant from biogas captured in covered treatment lagoons. The on-site electricity is generated by a 10 megawatt biogas fuelled power station owned and operated by electricity provider AGL. WTP currently produces about 95% of its electricity needs through on-site renewable energy generation. This reduces greenhouse gas emissions by 83,300 tonnes of carbon dioxide per year, which is equivalent to taking about 19,100 cars off the road. Since 2005,

390,000 megawatt hours of renewable electricity have been generated at the Western Treatment Plant, preventing the emission of about 470,000 tonnes of greenhouse gases.

Melbourne Water is currently investigating new sources of biogas including capturing dissolved methane in partly treated sewage exiting from under the lagoon covers. It has been estimated that between 10% and 20% of methane is currently lost in this manner. Melbourne Water has won funding under the Smart Water Fund for this work.

Another initiative involves growing algae biomass for conversion to biogas for electricity generation. It is hoped this will enable the recovery of nutrients contained in the sewage and take treatment load off the treatment plant, reducing operational expense and deferring capital expenditure.

This case study demonstrates how Melbourne Water has benefited the environment through reduced emissions which in turn pass savings through to customers' water service prices. Future generations will also benefit from the increased use of renewable energy.



SA WATER – SOUTH AUSTRALIA SUSTAINABLE APPROACH TURNS WASTE TO ENERGY, REDUCES CARBON FOOTPRINT

SA Water is the water utility wholly owned by the Government of South Australia for the people of South Australia. It delivers water and sewerage services to almost 1.5 million people across the State. This case study describes a project to harness biogas generated by the sewerage treatment process to produce electricity at SA Water's Bolivar Treatment Plant.

A sustainable approach to waste management and energy consumption

The Bolivar Waste Water Treatment plant (WWTP) is South Australia's largest sewerage treatment plant. Built in 1965, the plant now processes 60% of metropolitan Adelaide's raw sewage and treats approximately 135 million litres of residential and industrial water per day.

The plant is currently being upgraded to enable the use of all available biogas as efficiently as possible. This will maximise the security of energy supply to the Bolivar WWTP and minimise the overall cost of electricity for SA Water and reduce greenhouse gas emissions. It will also lower SA Water's carbon footprint and reduce the amount of electricity purchased from the electricity providers from 30 gigawatt hours to 5 gigawatt hours per year. The upgrade will also give the plant increased power supply alternatives and improve the reliability and supply of electricity. It is expected that 85% of the Plant's annual electricity requirements will be generated through the reuse of this biogas – a product that would have otherwise

been wasted. A sensitivity analysis based on one carbon price scenario was conducted and this added \$4.3 million in economic value to the project.

The project upgrades and works include the installation of new reciprocating engines to create more electricity from biogas; building a chemical dosing plant to reduce the formation of hydrogen sulphide; connecting natural gas; converting the existing gas turbine to run solely on natural gas and further electrical modifications throughout the site.

SA Water has been investigating several options for utilizing all the plant biogas since 2004. The final concept was developed using a combination of a local energy consultant and an Early Contractor Involvement process. A contract was awarded to Clarke Energy (Australia) Pty Ltd to carry out the major portion of the works. In particular they will be supplying the new generator sets. The new engines are now expected to be commissioned in mid 2013. The estimated cost of this project is \$25.9 million and will result in nett annual operating savings of \$1.3 million. Additionally, electricity market revenue of \$0.7 million per annum will be earned and around \$0.9 million worth of additional Renewable Energy Certificates (RECs) created each year.

The Bolivar upgrade provides a number of benefits for SA Water and the community it serves by creating a greener, more sustainable approach to waste management and energy consumption.



ACTEW WATER – AUSTRALIAN CAPITAL TERRITORY SAVING OF FISH HABITAT WHILE BUILDING NEW DAM

ACTEW Water (ACTEW) operates the water and sewerage assets and business in the ACT, supplying water services to over 150,000 customers and sewerage services to over 146,000 customers. This case study demonstrates an urban water project that is actively protecting the environment, particularly endangered fish species, while enhancing water security.

Cotter Dam enlargement threatened fish protection project.

As part of a series of water security measures, ACTEW is increasing the capacity of the Cotter Reservoir from 4 gigalitres to 78. As this involves raising the dam level by around 50 metres and increasing the shoreline from around 10 km to nearly 25 km, critical habitat for several aquatic species will be affected, including some threatened species. As ACTEW is committed to protecting the environment as well as Aboriginal and European heritage, multiple measures needed to be taken, particularly the provision of habitats for fish species, including the endangered Macquarie Perch.

When the enlarged Cotter Dam reservoir begins to fill, macrophyte reed beds that Macquarie Perch currently use as shelter will be inundated. It was identified that artificial rock reefs provide the most successful alternative habitat. Rocks of the right size and quality were sourced, and 7km of the habitat is being constructed at carefully selected sites. In addition, revegetation has been incorporated including the use of locally collected native seeds, trees, shrubs and grasses, and Xanthorrhoea trees.

To develop a comprehensive program to address environmental and water quality issues, ACTEW worked closely with experts from the University of Canberra, Australian National University, and the University of Sydney. A trial was conducted of artificial fish habitats for Macquarie Perch, to identify the preferred habitats. The plan complies with the requirements of the ACT's Nature Conservation Act and the Federal Government's Environment Protection and Biodiversity Conservation legislation, and addresses the concerns of key stakeholders such as the ACT's Environmental Protection Authority, Territory and Municipal Services and the Commonwealth Department for Environment, Water, Heritage and the Arts.

The project commenced following submission of a Development Application to the ACT Planning and Land Authority in early 2011. Construction of the artificial reef habitats is expected to be complete before the water level starts to rise in the enlarged Cotter Reservoir. A series of studies are being undertaken by various government agencies, university researchers and ACTEW to mitigate potential risks associated with the construction and later operation of the enlarged Cotter Dam. Results from these studies will enable ACTEW to understand and continue to manage the impact of fluctuating reservoir levels on Macquarie Perch food sources and other adaptive management measures to protect threatened species from predators and competitors within the enlarged Cotter Reservoir.



POWER AND WATER CORPORATION – NORTHERN TERRITORY TRAINING INDIGENOUS PEOPLE TO UNDERTAKE LOCAL WATER SERVICING WORK

Power and Water Corporation (PWC) is the sole provider of electricity, water supply and sewerage services to almost 80,000 customers across the Northern Territory – an area of more than 1.3 million square kilometres. This case study demonstrates a culturally sensitive, community supporting project that establishes a best practice model for indigenous engagement, training and development leading to sustainable management of water, driven by the local community members.

The Galiwin'ku water story:

Galiwin'ku water conservation: 'Empowering people to live sustainably'

Remote Indigenous communities in Northern Territory experience critical water shortage. Limited human resources, combined with the prohibitive cost and environmental impact of travel, makes it difficult to reach the 72 wide spread communities on water and energy conservation issues, as well as to identify water leaks in mains and government housing.

At the remote island community of Galiwin'ku, Power and Water employed, trained and mentored four indigenous locals as Water Conservation Ambassadors to educate fellow community members about their water resource, the importance of positive water use behaviours, and how to save water in their homes and workplaces to reach water conservation targets. The officers were supported with branded uniforms, talking book technology in the local language, a DVD series, posters, stickers and radio advertising. Working four days a week, the officers also identified water leaks, enabling PWC and the Department of Housing to increase efficiency, reducing water loss. Encouraging their communities to share their own stories around water and their community, the 'Galiwin'ku water story' increased public perception and awareness of the value of water.

Power and Water have one contracted officer on site at Galiwin'ku managing operational tasks, and a team of two responsible for the engagement of Indigenous communities on water and energy conservation across the Territory, hence why it was important to identify

a local organisation that could assist in the delivery of the project. PWC partnered with the local Community Development Employment Program providers, Community Enterprise Australia to identify the local community Ambassadors. The CEA staff has worked tirelessly to ensure that culturally appropriate and ongoing mentoring of the officers is core to the delivery of this project. Their dedication has been a great asset to Power and Water and this initiative.

The project commenced in May 2012 and will continue through until at least the end of the dry season. This means the officers are employed for eight months before upcoming upgrades to PWC's water supply infrastructure.

Populated predominantly by Indigenous Territorians, the Galiwin'ku community now understands where their water comes from, and is continuing to grow in respect for their water as a limited resource. They also appreciate that it takes a whole community to achieve sustainable management, and understand how individuals can better manage their own demand on water. Average demand for water per person has reduced from 1200 litres per equivalent person per day to 750 litres. They are well on the way to achieving the overall target of 550 litres. The four local indigenous people employed are now empowered to take an active role in the continued management of their community's water resource, and to take on other community educator roles.

PWC have designed an evaluation and monitoring process tailored to community engagement and activities projects, looking at before and after change in behaviours, attitudes and perceptions, and will undertake a comprehensive review at the end of the project. Federal funding has been secured to apply an extended version of the collaborative and community-driven Galiwin'ku project, in Gunbalanya. PWC look forward to opportunities for expansion of this approach to other water stressed communities.



SOUTHERN WATER – TASMANIA AWARD WINNING SOFTWARE TO TRACK METERING ROLLOUT

Southern Water is Tasmania's largest water and sewerage services provider, serving over 95,000 customers in 12 council areas. The introduction of water meters to Southern Tasmania necessitated the installation of a large network of meters in a short timeframe. This was achieved with the implementation of an award winning IT solution.

Managing the installation of water meters in a short timeframe

Before mid 2012, water pricing for a majority of southern Tasmania's urban areas was based on land value. As part of the industry's reform, pricing for water was changed to a two part approach – a water service charge and a volumetric usage charge. This change meant it was necessary for water meters to be installed by 1 July 2012. To manage the large meter installation program of 52,000 meters in a short timeframe of 12 months, a GIS solution was implemented. The system utilised Southern Water's existing information system foundation and leveraged the power of spatial information and relationships to automate the thousands of manual transactions that occur on a daily basis.

Southern Water's Metering Project Team commissioned the project management tool, which RIA Mobile GIS – a Tasmanian IT company – developed and supported. Esk Mapping & GIS (another Tasmanian IT company) was recruited to perform the role of System Administrator, effectively operating and managing the tool. The project management tool assisted with locating stop taps, scheduling meter installations, completing quality assurance checks and obtaining

first meter readings. The first residential water meter was installed utilising the first iteration of the project management tool on 4 April 2011.

Unmetered properties were identified using a central spatial database, with the information then sent to the contractor for installation of meters in batches, and onto billing and asset management systems. During the identification process specific instructions from customers regarding the proposed location of meters was recorded and passed to the contractor. Field officers received scheduled tasks via handheld units each day, ensuring information on the location of meters was based on pre-set workflows.

With different installation rates applying for meters in grass or concrete, the technology meant that likely project expenditure could also be forecasted and monitored. Other benefits from the technology were the validation of customer details, asset data collection and the integration of the billing system with the new meter reading system.

By installing efficient water meters Southern Water has reduced the cost of reading a meter from \$3 to 30c, and reduced water leakage and water waste through the identification of leaks in the reticulated network and within customers' connections. Ultimately Southern Water's customers benefit as the efficient installation of water meters will enable Southern Water to run a better and more cost effective business.

Use of the project management tool wound down in July 2012, with water meter data and processes moving to "business as usual" systems.



ACKNOWLEDGEMENTS

WSAA acknowledges the help and assistance of the following people in the compilation of this publication.

Anthony Ottaway Gladstone Area Water Board

Ben van den Akker SA Water

Carol Jdraque Melbourne Water

Chris Hare ACTEW Water

Emma Whale Sydney Water

Jim Dunham Southern Water

Kirra Spehr SA Water

Kylie Climie Power and Water

Mark Dedman SA Water

Mary Drikas SA Water

Nicolas McGay Melbourne Water

Ross Luttrell Southern Water

Ross Carter SA Water

Solonge Italiano Water Corporation

Vanessa Moscovis Water Corporation

POWER AND WATER THANKS

Community Enterprise Australia

(Jan and Mark Deacon)

Lisa Burarrwanga

Bruce Bukulatjpi

Junius Gondarra

Len Dhamarrandji and the Community members of **Galiwin'ku**



LEARN MORE > More case studies and expanded versions of these case studies are available on the WSAA website (www.wsaa.asn.au) in the Free downloads section.

Melbourne Office

Suite 802, Level 8
401 Docklands Drive
Docklands VIC 3008

Telephone 03 8605 7666
Facsimile 03 8605 7612

Sydney Office

Suite 1 Level 30
9 Castlereagh Street
Sydney NSW 2001

GPO Box 915
Sydney NSW 2001

Telephone 02 9221 5966
Facsimile 02 9221 5977

info@wsaa.asn.au

www.wsaa.asn.au

Copyright This document is copyright. No part of this document may be reproduced or transmitted apart from that permitted under the Copyright Act 1968, without the express, written permission of the Water Services Association of Australia Ltd.

Disclaimer The Water Services Association of Australia Ltd and individual contributors are not responsible for the results of any actions taken on the basis of information contained in this publication. WSAA and individual contributors disclaim all and any liability to any person in respect of anything, and the consequences of anything, done or omitted to be done by a person in reliance upon the whole or part of this publication.

Water Services Association of Australia Ltd 2012 ALL RIGHTS RESERVED

ISBN 1 920760 55 5

