OzWater11 Workshop: Investing in the Urban Water R&D Landscape in Australia

Australian Water Recycling Centre of Excellence
Goyder Institute for Water
National Centre of Excellence for Desalination
National Centre for Groundwater Research and Training
National Water Commission
Smart Water Fund
Urban Water Security Research Alliance
Water Services Association of Australia
Water Quality Research Australia

Wednesday 11 May, 1045-1215
OzWater 2011

Workshop Overview

Collectively the Commonwealth, State and Industry will be making an estimated $250 million cash investment by the utilities and urban water R&D Brokers over the next 5 years. A substantial proportion of these funds will be managed through R&D Brokers investing in a broad range of research areas, including drinking water treatment and management, recycled water (technology, efficiency, acceptance), stormwater, desalination, groundwater, wastewater treatment and management, water quality, public health, smart cities, infrastructure, climate and energy, policy and regulation, technology and consumer insights.

The term 'Broker' has been used to define the roles of organisations that are the vehicles to facilitate, coordinate and invest in urban water R&D on behalf of state government, federal government and industry sponsors. These organisations do not undertake research themselves. The collective of Brokers in the urban water R&D sector include: the Australian Water Recycling Centre of Excellence, Goyder Institute for Water Research, National Centre of Excellence for Desalination, National Centre for Groundwater Research and Training, National Water Commission, Urban Water Security Research Alliance, Victorian Smart Water Fund, Water Services Association of Australia and Water Quality Research Australia.

The purpose of this workshop is for the broader water sector to learn about each of the R&D Brokers, the directions being taken to coordinate national urban water R&D investment and perspectives from leaders in the urban water sector. The CEO's from each of the R&D Brokers will facilitate round table discussions to hear your perspective on how coordination can be best achieved and what it means for stakeholders at the coal face of research – whether you are a research provider or research adopter.

Acronyms

AWRCE	Australian Water Recycling Centre of Excellence
NCED	National Centre of Excellence for Desalination
NCGRT	National Centre for Groundwater Research and Training
NWC	National Water Commission
SWF	Smart Water Fund
UWSRA	Urban Water Security Research Alliance
WSAA	Water Services Association of Australia
WQRA	Water Quality Research Australia

Workshop Agenda

The Urban Water R&D Investment Landscape	Mark O'Donohue, CEO, AWRCE
A National Perspective	Will Fargher, GM Water Markets and Efficiency, National Water Commission
A Utility Perspective	Anne Barker, MD, City West Water
A Research Provider Perspective	Alan Gregory, Theme Leader: Urban Water, CSIRO Water for a Healthy Country Flagship
A Private Sector Perspective	Ross Young, Business Leader Water Australia , GHD
Panel Q&A	Presenters and the CEO's of Urban Water Broker Organisations
Workshop session: A CEO from each Urban Water R&D Broker will be seated at each table - *Advantages & challenges of a cooperative approach* - *What does UWR&D coordination mean for your organisation?* - *Can this model contribute to a national knowledge & research strategy?*	All
Tables to Report back	Urban Water R&D CEO's
Where to next	Christine Cussen, CEO, SWF

Workshop facilitated by Michele Akeroyd, Program Manager, WQRA

WATER QUALITY RESEARCH AUSTRALIA

CEO Ms Jodieann Dawe

Vision
The trusted provider of scientific evidence needed to ensure safe water for Australians

Mission
To lead and facilitate high quality and collaborative research of national significance and to promote implementation of research outcomes to address current and emerging public health issues in water quality.

Type of entity
Water Quality Research Australia Limited (WQRA) is a not-for-profit company, established and funded by its members, to undertake collaborative research of national application on drinking water quality, recycled water and relevant areas of wastewater management. Its members include Australian utilities, universities, research organisations, water industry consultants and state government departments. WQRA has an independent Chair and Directors nominated and elected from the company's member organisations.

Commencement date
WQRA succeeded the Cooperative Research Centre for Water Quality, which ended in July 2008 after two rounds of funding from the Commonwealth Government. WQRA was officially launched in August 2008.

Board members
Professor Michael R Moor (Chair), Ms Jodieann Dawe (Executive Director), Professor Simon Beecham (UniSA), Mr Keith Cadee (WA Water Corp) Dharma Dharmabalan (Coliban Regional Water), Dr John Howard (AWQC), Dr Hamish Reid (South East Water), Dr Melita Stevens (Melbourne Water), Professor T. David Waite (UNSW).

Member Organisations
AWA, Barwon Water, Ben Lomond Water, Central Gippsland Water, Central Highlands Water, City West Water, Coliban Water, Cradle Mountain Water, Degrémont, Dept Health (Vic), Goulburn Valley Water, Grampians Wimmera Mallee Water, Hunter Water Corporation, Melbourne Water , Power & Water , SA Water, South East Water, Southern Water, Sydney Catchment Authority, Veolia, Wannon Water, WA Water Corp, Yarra Valley Water, AWQC, Centre for Appropriate Technology, ChemCentre, Curtin, Flinders, Griffith, Monash, Murdoch, NMI, RMIT, Adelaide Uni, Uni of Newcastle, UNSW, UQ, Uni SA, UTS, Uni of the Sunshine Coast, UWA, Uni of Wollongong, VU, Dept Health (NSW), Department of Water (WA), GHD, Lower Murray Urban and Rural Water Corp, Water Futures, Dept Health & Human Services (Tas), Syme and Nancarrow Water.

Entity overview
The provision of sustainable clean safe drinking water is fundamental to the maintenance of our society. WQRA plays a major role in this task by facilitating and promoting research within the water industry to achieve this goal. WQRA is a unique association of water related organisations in Australia. Its three constituencies of industry, research providers and general members provide it with a clear perspective of national water research needs. WQRA is helping industry to achieve its goals in a shifting environment of responsibility for water supply. It harnesses local and international skills to achieve water research outcomes.

WQRA has established rigorous internal processes and extensive capabilities which, when coupled with the leverage available through its Member organisations, is able to deliver high quality outputs through its research and education programs that substantially close the gap between today's challenges and the desired levels of knowledge, skills and training.

Business model
WQRA's research is delivered through three programs – the Drinking Water Program, Recycled Water program and Wastewater Program. WQRA is the facilitator and coordinator of research, with WQRA Members delivering the research projects. Robust governance processes have been established to support for internal operations to ensure that all projects are technically sound, have the capacity to deliver and are truly collaborative with Industry, Research and General Members. WQRA is funded by its Members through cash and in-kind membership contributions.

Research focus

The main focus of WQRA research is on urban water issues related to public health and acceptability aspects of water supply, water recycling and aspects of wastewater management. WQRA also has an Education Program, which supports the training of young industry professionals to help build long term operational excellence and a strong research capability in the Australian water community.

More specifically, WQRA invests across 15 Priority Research Areas, as identified by Members, to underpin decision-making with weight-of-evidence based science and research outcomes:

- Emerging and current public health challenges in water sources
- Identifying risks and closing critical knowledge gaps
- Identifying and assessing appropriate intervention strategies to address these risks
- The development of targeted management and monitoring systems to support public health outcomes
- Providing the evidence to support and inform development of public health policy and management plans.

The 15 Priority Research Areas span areas such as chemical and microbiological contaminants in water supplies, integrity and efficiency of membranes, management of recycled and alternative water supplies, source water quality, water supply quality in rural and remote regions, verification of system performance and aesthetics and public perception of water supplies.

Investment approaches

WQRA invests in research through three mechanisms. These are:

- Core Research. These are projects that are research priorities defined and agreed by WQRA. Members are invited to submit proposals that meet the scope of the identified priorities.
- ARC Linkage. WQRA supports its Research Members with funding support as an industry partner. WQRA calls for expressions of interest from its Members twice a year.
- Collaborative Projects. This investment approach allows WQRA to be responsive and flexible in investing in research that aligns with WQRA's Research Strategy or any emerging issues that require immediate action. Through this approach, WQRA partners with National and International organisations.

R&D investment to date

WQRA has successfully established a Foundation Research portfolio of more than 50 research projects addressing 15 priority research issues in drinking and non-potable water with a research value in excess of $60million. This represents a ten-fold leverage on the $5million of WQRA cash investment. This outcome was achieved through the commitment of the WQRA Member community and external stakeholders and the in-kind contributions of Members and represents a significant investment in knowledge generation for the future.

Focus of investment

WQRA has successfully initiated projects with the US Water Research Foundation, US WateReuse Foundation, Global Water Research Coalition, Smart Water Fund, Australian Water Recycling Centre of Excellence, NHMRC, ARC, National Centre of Excellence for Desalination and the National Water Commission.

R&D outcomes delivered

In the transition from the CRCWQT to WQRA, a commitment was made by WQRA to oversee completion of those projects that were still underway, or where final reports were being finalised. WQRA has overseen the completion of 35 CRCWQT final reports and management of a small number of research projects that are now nearing completion. Some of the early R&D outcomes from WQRA investment include:

- Development of the Field Guide to the Community Water Planner to support management of water supplies in remote and regional communities
- A national approach to the health risk assessment, risk communication and management of chemical hazards from recycled water
- Completion of the International Guidance Manual for the Management of Toxic Cyanobacteria

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National Centre of Excellence in Desalination AUSTRALIA

NATIONAL CENTRE OF EXCELLENCE IN DESALINATION

CEO Neil Palmer

Vision:
The National Centre of Excellence in Desalination will be a global leader in the delivery of sustainable water solutions through excellence in desalination research, practice and knowledge transfer, producing new technologies, new knowledge, and new wealth for Australia.

Mission:
Delivery of efficient and sustainable augmentation of traditional water sources through desalination to multiple water markets providing security against the natural variability of rainfall, the potential impact of climate change and the variable quality of multiple water sources.

Type of entity:
Unincorporated Joint Venture

Administering Organisation:
Murdoch University

Participating Organisations:
University of WA; Curtin University; Edith Cowan University; Flinders University; University of SA; Monash University; Victoria University; Deakin University; University of NSW; Sydney University of Technology; University of Queensland; CSIRO. University of Wollongong has signalled its intention to join.

Commencement date:
23 July 2010 (official launch at Rockingham, WA)

Board members:
Graeme Rowley - Fortescue Metals (Chair), Keith Cadee - Water Corporation (Deputy Chair), Vicki Chen - UNSW; Max Lu - UQ; David Doepel - Murdoch; Dr Dharma Dharmabalan - Coliban Water; Adam Lovell - WSAA.

Entity overview:
The Centre has been established following a competitive process and seeks to engage the desalination research community, process integrators, suppliers and clients of the desalination industry in Australia to advance desalination capability and know-how. Murdoch University is the Administering Organisation and there are 11 universities and CSIRO to make up the 12 Participating Organisations. A distinguishing feature of the Centre is the establishment of a Desalination Research Centre at Rockingham, south of Perth.
The Research Centre will include laboratories, a pilot scale test facility, offices, workshop and a visitor centre and will be the administrative centre of the NCEDA. Construction and refurbishment is currently under way with official opening planned for 4 September. Research is conducted under the guidance of a Research Advisory Committee chaired by Mr Rhett Butler of Siemens. There is a very strong focus on commercialisation of intellectual property developed from the research projects and guidance is provided by a Commercialisation Advisory Committee chaired by WA venture capitalist Mr Larry Lopez. Strong international links have been established by the appointment of Mr David Furukawa from USA as Chief Scientific Officer.

Research focus:

The Centre's Research Mandate is:

- To optimise and adapt desalination technology for use in Australia's unique circumstances;
- To develop suitable desalination technology for use in rural and regional areas; and
- To efficiently and affordably reduce the carbon footprint of desalination facilities and technologies.

Business model:

Research funding of $20m over 5 years has been provided from the Australian Government's National Urban Water and Desalination Plan. The Western Australian Government has also contributed $3m towards the Rockingham Desalination Research Facility. Murdoch University and the 12 Participating Organisations (POs) pay fees which cover the administration costs of the Centre. In return for the fee, POs have exclusive rights to bid for research funding in defined Funding Rounds. POs may include other research organisations from within Australia and overseas, and industry partners. Ultimately, financial viability is the Centre's goal through externally funded research, membership fees, contracted research and consulting services, education and training and establishment of a Foundation.

Investment approaches:

Expressions of interest for funding are invited from time to time. Two have been completed and Funding Round 3 is in progress. Proposals must come through Participating Organisations, but may include other research and industry partners. Proposals are vetted and recommended by a Research Advisory Committee for approval by the Board. A total of 95 proposals were received for the first two funding rounds, with 23 projects currently in progress.

R&D investment to date:

$5.9m has been committed from the National Urban Water and Desalination Plan. A further $16.8m in cash and in kind has been committed by research and industry partners, bringing the total to $22.7m.

Focus of investment:

Research strategic objectives are:

- To lead world research in energy efficient desalination technologies;
- To provide facilities to researchers and industry to support joint development by academia and industry of new desalination technologies;
- To commercialise resultant new desalination technologies;
- To build national capacity and capabilities in desalination research and industry within the broader context of total water solutions;
- To promote increased public support for alternate water sources; and
- To become a self sufficient research centre based on strong industry partnerships and sound commercial principles and practices

R&D outcomes delivered:

None completed as yet. 23 projects are in progress.

Website: www.desalination.edu.au

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URBAN WATER SECURITY RESEARCH ALLIANCE

CEO
Don Begbie

Vision
Australia's leading urban water research alliance providing South East Queensland with increased knowledge and solutions across the water cycle.

Mission
Answering key research questions about SEQ's urban water security.

Type of entity
The Alliance is a collaborative research partnership. It is not a legal entity.

Commencement date
July 2007

Board members
Chris Davis, Chair, Dr Christine Williams (DERM), Ms Karen Waldman (QWC), Mr Alan Gregory (CSIRO), Mr Scott Keyworth (CSIRO), A/Prof John Mott (UQ), Mr Larry Little (GU).

Administering Organisation
CSIRO

Partner Organisations
The State of Qld, CSIRO, University of Queensland and Griffith University.

Entity overview
The Urban Water Security Research Alliance is a $50 million partnership over five years between the Queensland Government, CSIRO's Water for a Healthy Country Flagship, Griffith University and The University of Queensland. The Alliance has been formed to address South East Queensland's (SEQs) emerging urban water issues with a focus on water security and recycling.

Research focus
The Alliance research program currently consists of 17 inter-related projects delivered under three research themes:

1. Reducing Water Grid Demand
2. Water Source Quality
3. Total Water Cycle Planning and Management to Enhance Sustainability and Efficiency

Business model
The Queensland State Government provides $5 million cash each year, to be matched by the Research partners in-kind.

Investment approaches
$4 million cash is allocated to a core research program, an additional $625K allocated to strategic, priority contestable projects recommended by the Research Advisory Committee and approved by the Board.

R&D investment to date
As at the end of June 2010, the Alliance had invested a total of $12.828 million cash in the research program, matched with $13.823 million in-kind contribution from the Research Partners – a total research investment to date of $26.653 million.

Focus of investment

Key projects to help reduce water grid demand include: stormwater harvesting and us;, rainwater tanks (individual and cluster scale); and a residential water end use study liked in with a social science project researching water conservation and demand management behaviour at the household level. Our water quality research has shifted focus on Purified Recycled Water (PRW) to human health impacts of pathogens and trace chemical contaminants in the various source waters (rainwater tanks, dams, potable grid water, etc). In addition, Alliance research has focused on a range of issues such as climate change and impact on inflows to dams, evaporation losses from large dams, total water cycle planning and developing a proof-of-concept, prototype, on-line, real-time monitoring system for sewer systems. The Alliance is also making a small investment into future research by investigating human elements (eg judgement, decision making, communication) in risk management and quality control systems and also scoping a framework for moving to Water Smart cities.

R&D outcomes delivered

Alliance research provides assurance that SEQ has high-quality drinking water, with disinfection by-products unlikely to be a concern and PRW that can be safely added to drinking water supplies. A bioanalytical assessment of samples collected from each of the seven barriers of the PRW system proved that the seven treatment barriers are working well and that the quality of PRW is at least as good as existing tap water. A preliminary audit of six hospitals in SEQ indicate that, for 18 of the 24 substances evaluated, the predicted contribution of hospitals to the total load of pharmaceutical residues in sewage is below 10 percent.

Research also showed the contribution to potable supplies of rainwater tanks and stormwater harvesting, and identified showering as the biggest contribution to residential water end uses in SEQ. A desktop study showed water savings from mandated rainwater tanks, with savings from mains supplies up to 52 kL/household/year with an average of 40 kL/household/year. A communal rainwater system on the Gold Coast provided 82% of the potable demand (42 kL per household per year). Rainwater tanks have a greater energy burden than traditional dam water supplies depending on the pump used, and there is real room for improvement in the design of tank and pump technology.

While human-induced climate change may be decreasing the amount of water flowing into Queensland's dams, natural variability is the main cause of reduced rainfall in Queensland over the past ten years. Research on the downscaled climate models points to an increase in the frequency and duration of drought events later in the 21st century. Rising temperatures will cause an increase in evaporation, which will have a big influence on inflows to dams regardless of rainfall.

Natural processes in reservoirs take only three to four days to achieve 90 percent removal of bacteria such as the virulent strain of E.coli and Salmonella, while it takes 12 days for the same level of decay of adenovirus.

A prototype real-time, on-line event detection system has been developed for the sewer network. This can provide an early warning mechanism ensuring the integrity of the sewage treatment system is maintained.

Techniques have been developed to accurately measure evaporation loss from large water bodies for the first time. Monolayers have been shown as having the best potential for reducing evaporation losses and are currently being evaluated in trials on a large farm dam.

Website

www.urbanwateralliance.org.au

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Australian Water Recycling Centre of Excellence

CEO
Dr. Mark O'Donohue

Vision
The Centre is recognised as a world leader in research and promotion of sustainable water recycling.

Mission
To enhance the management and use of water recycling through industry and research partnerships, build capacity and capability within the recycled water industry, and promote water recycling as a socially, environmentally and economically sustainable option for future water security.

Type of entity
The Centre of Excellence is administered by Australian Water Recycling Centre of Excellence Limited, a not-for-profit company limited by guarantee.

Commencement date
The Centre signed a funding agreement with the Commonwealth Government in December 2009 and was officially launched by the Federal minister for water in March 2010.

Board members
David Gray (Chair), Mark Pascoe, Stephen Golding, Scott Standen, David MacDougall.

Administering Organisation
In addition to being administered by Australian Water Recycling Centre of Excellence Limited, WaterSecure, a State of Queensland Statutory Authority and the provider of safe and secure climate-resilient water sources to South East Queensland provides corporate services to the Centre of Excellence.

Partner Organisations
The Centre is forming partnerships with research and industry organisations that are leaders in water recycling research and innovation and will continue to seek out partnerships that further enhance its research and commercialisation capabilities. Currently WaterSecure, Melbourne Water, Veolia, GHD, University of Queensland, Griffith University, University of New South Wales and the CSIRO are participants in the Centre and contribute individuals to the Centre's Research Advisory Committee.

Entity overview
The company is governed by a Board of Directors, managed by a CEO, and its investment strategy is guided by a Research Advisory Committee which comprises delegates from distinguished water industry entities that represent a collaboration of commercial and research interests. The Commonwealth Government is currently the principle financial sponsor of the Centre through the Department of Sustainability, Environment. Water, Population and Communities.

Business model
The Centre is not for profit, industry focused and goal oriented. The Centre's principal role is to broker discussion on priority research areas with industry, government and research organisations, run nationally competitive processes to award research projects, and manage the delivery and adoption of the research outcomes. Applied research projects are expected to provide both cash and in-kind contributions to secure Centre funds, and the Centre seeks to recover some of its operational costs by charging an overhead on the cash contributions it makes to a project. The Centre has the flexibility to enter into joint funding arrangements with other nationally or internationally recognised research investment organisations, increasing the pool of funds that may be available to invest in research projects of mutual interest. The Centre is listed on the Australian Competitive Grants Register.

Research focus

Securing Australia's water future requires a diversity of water sources in ensure we are prepared for future droughts and changing population patterns. Water Recycling has a substantive and important contribution to make in securing our future water supplies and improving the health of our waterways. The Centre is a national Centre of Excellence and will invest in the full spectrum of water recycling opportunities in metropolitan and regional communities, including water recycling for agricultural, industrial, environmental, potable substitution and potable use.

Through a national consultation process, the Centre finalised its strategic research plan in 2010 and identified four goals which will enhance the efficiency, expansion and acceptance of water recycling in Australia. These four goals will focus the research undertaken by the Centre, and guide its funding allocations.

Goal 1: The social/ economic/ environmental value of water recycling is demonstrated and enhanced.
Goal 2: A national validation framework for water recycling is established
Goal 3: Reclaimed water is seen as an acceptable 'alternate water' for augmenting drinking water supplies
Goal 4: A national knowledge, training and education program for water recycling is established.

Investment approaches

The Centre's is keen to leverage its research investment, partnering in industry relevant research with national and international water associations, leading water utilities, water companies, government agencies and research institutions. In the funding rounds to-date, the Centre has released technical scopes outlining the objectives, scope and indicative budget, run information sessions with interested parties, and published relevant information on its website. Prospective project teams comprising both industry and research organisations are initially asked to provide an expression of interest addressing the technical scope. Expressions of interest are reviewed and a subset is asked to provide a detailed fully costed proposal to the Centre. Proposals with high technical merit, strong industry and research support, and which comply with the Centres funding requirements are reviewed, and a recommendation is made to the Board for funding.

R&D investment to date

The ARWCE has now run three funding rounds to deliver on the Centre's goals. The first funding round was to develop a national validation framework for water recycling in Australia. The second funding round was to understand and help remove barriers to reclaimed water being seen as an acceptable alternate water source for supply augmentation, with a proposal now in the final stages of review by the Centre. The third funding round sought proposals to demonstrate and enhance the social/ economic/ environmental value of water recycling, with full proposals currently being reviewed prior to recommendations for funding being made to the Board. Each of these funding rounds was allocated up to $3 million, and at least one further funding round is expected to be announced later this year.

Focus of investment

The first Centre project will be lead by Water Quality Research Australia and includes participants from more than 20 organisations including the CSIRO, leading universities, state regulators, and utilities and manufacturers involved in water recycling. In addition to funding from the Centre of Excellence and Water Quality Research Australia, the initial part of this project will receive financial support from Dow Chemical and the Water Services Association of Australia.

R&D outcomes delivered

The Centre is at the early stages of its research investment, with projects only now being initiated. Project leaders will be expected to provide an update on initial research outcomes at national (AWA and WSAA) water recycling forums in 2012.

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WATER SERVICES ASSOCIATION OF AUSTRALIA

www.wsaa.asn.au

Acting Executive Director
Adam Lovell

Vision
Water Services Association of Australia's (WSAA) vision is 'Valued Water Solutions for a Better Future'

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

Type of entity
WSAA is the industry association that supports the Australian urban water industry. Its members and associate members provide water and wastewater services to approximately 16 million Australians and many of Australia's largest industrial and commercial enterprises.

Commencement date
Water Services Association of Australia (WSAA) was established in 1995 to undertake water quality testing and engineering research on behalf of Australia's urban water utilities. During its establishment years WSAA also became a central point of liaison in collaborative projects identified by member utilities. In 2004, WSAA identified that it had a role to play in advocating on behalf of the member utilities at the National level. This included active involvement in policy advice and support for policymakers particularly at the Federal Government level.

Board members
Kevin Young, Hunter Water (Chair)
Sue Murphy, Water Corporation (Deputy Chair)
John Ringham, SA Water (Industry Member)
Jon Black, Unitywater (Industry Member)
Kerry Schott, Sydney Water (Industry Member)
Kevin Hutchins, South East Water
Peter Borrows, Seqwater (Industry Member)
Shaun Cox, Melbourne Water (Industry Member)
Adam Lovell, WSAA

Entity overview
The Association facilitates collaboration, knowledge sharing, networking and cooperation within the urban water industry. It is proud of the collegiate attitude of its members which has led to industry-wide approaches to national water issues. WSAA can demonstrate success in the standardisation of industry performance monitoring and benchmarking, as well as many research outcomes of national significance. The Executive of the Association retain strong links with policy makers and legislative bodies and their influencers, to monitor emerging issues of importance to the urban water industry. WSAA is regularly consulted and its advice sought by decision makers when developing strategic directions for the water industry.

Business model
Three committees on Asset Management, Water Quality and Health and Environment and Sustainability oversee WSAA programs and activities. These committees are chaired by members of the WSAA Board and each of these committees has a strategic plan which outlines the priorities in relation to research and projects.

Research focus

WSAA delivers its program of work through 4 key strategic areas – Water Quality and Health, Strategic Asset Management, Environment and Sustainability and Strategic Advocacy and Policy. WSAA conducts research in collaboration with its members in all of these key strategic areas and each is supported by a committee of senior water utility managers with specialist knowledge in these areas. Coupled with membership of the Water Research Foundation, WERF, GWRC, Water Reuse Foundation, WQRA and affiliations with other international bodies WSAA is the key urban water research organisation in Australia.

Investment approaches

An important part of maximising WSAA's research investment is access to relevant water research around the world. In July 2009, WSAA became subscribers to the two largest urban water research organisations in the US, the Water Environment Research Foundation (WERF) and the Water Research Foundation. This relationship allows WSAA and its Members access to over USD $28 million worth of research outcomes per annum. It also gives WSAA the ability to influence research programs, and the scope and prioritisation of projects as well as access to the numerous software tools that have been developed to enhance uptake of the research. Annually over 20 WSAA members

WSAA also has a strong relationship with research organisations and funders in Australia to ensure WSAA priorities are included in the considerations of entities such as CSIRO, Water Quality Research Australia (WQRA) and the Centres of Excellence in Water Recycling and Desalination.

R&D investment to date

WSAA's annual $600,000 investment in WERF and the WateRF ensures the research being carried out is in WSAA's priority research areas. WSAA has representation on the WERF and WateRF Research Advisory Councils (RAC) as well as Project Advisory Committees (PAC). WSAA also has representatives on the WERF Issue Area Teams and Exploratory Teams for five program areas.

Focus of investment

The estimated annual expenditure on Australian water industry research is between $130 - $150 million and WSAA Members contribute a significant proportion of this amount in cash and in-kind. WSAA's The focus on investment includes:

- preparing the water utilities for regulatory change
- enhancing leverage for members through excellence in knowledge sharing
- facilitating through seed funding and in-kind contributions to national and international research of the highest quality.

R&D outcomes delivered

There are currently over 400 projects in the WSAA Member research projects list. Over the last 12 months WSAA has delivered numerous research projects and reports. Some of the reports the include:

- Direct Methane and Nitrous Oxide emissions from full-scale wastewater treatment systems
- Water and Energy Report Mark II
- Implications of population growth in Australia on urban water resources
- Meeting Australia's water challenges – Case studies in commercial and industrial water savings
- Leakage and pressure management report
- Review of Approaches to Asset Management Decision Support Tools and Quantifying Asset Related Risk
- Management of sewer blockages

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Smart Water Fund

SMART WATER FUND

CEO Ms Christine Cussen

Vision

Smart investments in smart research for a water smart future

Mission

- To be Victoria's flagship centre for funding and managing industry led and customer driven research and innovation to increase the water sectors readiness for addressing emerging challenges.
- Through leveraging our smart investments we will deliver valuable outcomes and measurable returns to our customers, stakeholders and the water industry.
- The Smart Water Fund will become a leading advisor to the water industry by building strong Australian and international networks to identify world's best practice research and innovation trends.
- We will relentlessly pursue excellence in driving knowledge uptake and utilization across the water industry.

Type of entity

The Smart Water Fund is an unincorporated Joint Venture of the Victorian Government (represented by the Department of Sustainability and Environment), Melbourne Water, City West Water, South East Water and Yarra Valley Water. The Smart Water Fund is an industry led fund that manages research investments on behalf of the Victorian water industry, leveraging national and international links.

Commencement date

The Smart Water Fund was established in 2002.

Board members

Ms Anne Barker (Chair), Mr Shaun Cox, Mr Tony Kelly, Mr Allan McPherson, Mr Kevin Hutchings (Acting).

Entity overview

The Smart Water Fund is the Victorian water industry's flagship centre for funding and managing collaborative research in the water sector. Established in 2002, the Smart Water Fund is an initiative of Victoria's water utilities and the Victorian Government that invests in water industry led research and innovation in urban water management.

Victoria has experienced more than a decade of drought associated with the effects of climate change and must adapt to secure urban water supplies for the future. The Smart Water Fund invests in the development of smarter approaches to how we manage, consume and reuse Victoria's water resources.

To meet these challenges, the Smart Water Fund embraces a 'big picture' approach by considering all elements of the water cycle and the interlinking disciplines that work across it (i.e. engineering, science, social research and economics).

The Fund has two key aims:
– To invest in water industry led applied research projects that deliver valuable knowledge and commercially focused outcomes.
– To relentlessly pursue knowledge transfer opportunities that drive knowledge uptake and utilisation, for the benefit of Victoria's water utilities and their customers.

Business Model

The Smart Water Fund business model evolves from the role of 'funding administrator', expanding its activity to encompass the role of 'investment portfolio manager'. The new business model extends the role of Smart Water Fund further along the value chain beyond research management to include knowledge transfer and the creation of a water industry 'Information Hub'. Under the Strategic Plan, the Fund's investments will focus on business and customer returns, with a greater commercial focus in the assessment and selection of research projects.

Research and Investment focus

To address the research needs of the Victorian water industry, the Smart Water Fund develops an annual Research Plan in collaboration with its shareholders and other key stakeholders. The Research Plan outlines the key research areas in which the Fund will invest, on behalf of the Victorian water industry. The Research Plan promotes a collaborative approach to research investment and ensures that duplication of effort is avoided by each of the shareholders having an active role in the creation of the Plan.

The Smart Water Fund has a flexible approach to research investment and focuses on a broad range of research areas that are reviewed and agreed annually by the Fund's shareholders. The Fund will continually review the research landscape and will seek to invest in areas where there is a knowledge gap.

The Fund's current priority research themes include:

- water smart cities/integrated water management
- intelligent networks
- water quality/product quality
- water security/efficiency
- energy-water nexus
- resource recovery
- market orientated regimes
- climate change
- asset management
- consumer insights

Investment approaches

The Smart Water Fund manages two unique funding streams;

- Open Innovation Stream - funding for externally driven research projects;
- Targeted Research and Development Stream - funding for water industry driven research priorities in line with key research theme areas.

The Fund has a desire to leverage its research investments, partnering in industry relevant research with national and international water associations, water utilities, government agencies and research institutions.

Investments are aligned with agreed research themes that are updated annually in consultation with the Fund's shareholders and in line with its Research Horizon Framework. The Smart Water Fund investment criteria recognise the importance of technical and commercial imperatives; and in particular:

- demonstrates a strong link to quantifiable return on investment (revenue generation, cost savings, environmental savings)
- demonstrates a level on innovation or results in the generation of new information of strategic value
- must have a clear exit strategy to progress and use the outcomes (utilisation)
- must have wider applicability beyond the needs of the applicant

Smart Water Fund leads the development of an annual Research Plan and plays a strong role in the application screening and project selection process. The Investment Review Committee (IRC) consisting of both technical and commercial water industry expertise is Chaired by the Smart Water Fund CEO to assess investment proposals and make determinations on successful funding recipients.

Under the SWF funding model, investments will typically be in the range of $100,000 - $500,000, and by preference pursue leveraged (i.e. co-funding) investment opportunities. Research and investment will focus on applied research with a greater focus on near term (1-5 years) project outcomes (approx 85% of investment value). The Fund allocates a portion of its investments to longer term (5-10 year) research priorities that assist the industry be market ready for emerging challenges (approx 15% of research value).

R&D investment to date

The Smart Water Fund has conducted seven funding rounds to date. In this time, approximately 180 projects have received total funding of $25 million. This investment has delivered a total research value of $50 million.

R&D outcomes delivered

The Smart Water Fund has delivered over 180 completed projects since 2002. Key research outcomes that have been supported by the Smart Water Fund include:

- Development of Aquifer Storage and Recovery (ASR) Guidelines for Greater Melbourne. Project also delivered Victoria's first ASR demonstration scheme.
- Investigation into Industrial Ecology Opportunities for Greater Melbourne
- Assessment of household and industrial sources of critical contaminants
- Creation of garden watering efficiency website SmartGardenWatering.org.au
- Guidelines for the use of recycled water in industrial applications
- Development and demonstration of integrated stormwater harvesting, distribution and reuse schemes
- Development of a National Protocol for Greywater System testing and validation

Website: www.smartwater.com.au

Telephone: 1800 882 432

GOYDER INSTITUTE FOR WATER RESEARCH
www.goyderinstitute.org

CEO Dr Tony Minns

Vision
To support world leading water resource management in South Australia through excellence in scientific research and in doing so, underpin the sustainable development of the State.

Objectives
The Goyder Institute has been established to enhance the South Australian Government's existing capacity to develop and deliver science-based policy solutions and in doing so underpin the sustainable development of the State. It is further intended that this will strengthen the State's position as an international leader in water resource management providing the South Australian community with confidence that the best scientific minds available are resolving the State's key water resource management issues.

The institute will provide knowledge to support:

- the delivery of reliable and resilient urban water supplies that meet future needs;
- the ongoing viability of existing water dependent developments and the identification of future sustainable water resource development opportunities;
- the provision of environmental water to achieve optimal outcomes;
- proactive responses to climate change in water resource management; and
- effective water management policy and decision making with clear and transparent trade-offs.

Type of entity
The Goyder Institute is a collaboration (joint venture) between the State Government of South Australia, CSIRO, Flinders University, the University of Adelaide and the University of South Australia. The SA Government has committed $25 million over five years, with CSIRO and the three universities providing matching contributions to create a $50M research Institute.

Commencement date
The Goyder Institute was established in 2010

Board members
Dr Ian Chessell (Chair), Scott Ashby (Department for Water), Greg Mackie (Department of Premier and Cabinet), Scott Keyworth (CSIRO), Dr Bill Young (CSIRO), Professor Mike Young (University of Adelaide), Professor David Day (Flinders University), Professor Carolyn McMillan (University of South Australia).

Administering Organisation
CSIRO

Partners
The Government of South Australia, CSIRO, University of Adelaide, Flinders University and University of South Australia.

Entity overview
The Goyder Institute funds R&D that will improve water management in the state by engaging government objectives, water policy makers, technical staff in government agencies and research providers. All projects will contribute research to inform priority water policy issues facing South Australia and to inform and enhance policy development and water management in South Australia.

Research focus
The Institute has four Research Themes: Urban Water; Industry Development; Environmental Water; and Climate Change. Projects funded under the Goyder Institute are integrated, involving multiple organisations and inter-disciplinary research.

The Environmental Theme addresses water management arrangements to achieve optimal outcomes for the environment while also achieving social and economic outcomes. The Environmental Water Research Theme aims to provide:

- knowledge to support provision of water to environmental assets to ensure resilient, connected and healthy ecosystems.
- modelling tools and decision support frameworks that integrate hydrological, environmental and economic considerations.
- enhanced scientific basis to test resource allocation scenarios.
- leadership in environmental flow science and in the communication of research outcomes to environmental managers.

The Urban Water Research Theme addresses secure reliable, resilient and safe metropolitan and regional urban supplies for projected population and industry growth in a changing climate at an acceptable cost, in a socially acceptable manner while protecting and enhancing the environment. The Urban Water Research Theme aims to:

- Provide scientific underpinning to strategies to ensure reliable and resilient urban water supplies for future needs.
- Inform aspects relevant to decision making of all water supply and savings options.

The Climate Change Research Theme addresses climate variability and change to ensure that South Australia has resilient water infrastructure, sufficient environmental water and is able to provide water security for industry and urban settlements. The Climate Change Research Theme aims to:

- Increase our understanding of risks, vulnerabilities and opportunities associated with climate change in South Australia.
- Develop effective, region specific adaptation strategies that meet human water supply needs and natural resources.
- Develop tools to support mitigation strategies.

The Industry Development Research Theme addresses current and future sustainable water resource management for water dependent industries. The Industry Development Research Theme aims to:

- Provide science to underpin sustainable water resource management for existing water resource developments.
- Provide science to underpin identification of future sustainable water resource development opportunities.

Business model

The Goyder Institute has $25m cash from the South Australian Government that is to be matched with at least $25m in-kind from partners and affiliates in the 5 years from 2011 to 2015

Investment approaches

The Goyder Institute makes investments in R&D on an annual basis, with projects developed by July each year. The Goyder Institute works with its partners and will develop relationships with others to develop projects that are of national and international significance.

R&D commitment to date

The Goyder Institute has committed to $14m in research to underpin the development of water planning and policy in South Australia. Major Projects are:

- “Managed Aquifer Recharge and Urban Stormwater Use Options”
- “Development of an agreed set of climate projections for South Australia"
- “Murray Flood Ecology”, which will help to facilitate efficient use of environmental flows as the River Murray receives significant inflows after the worst drought in recorded history.
- “Facilitating Long-Term Outback Water Solutions” (FLOWS) will identify and assess potential groundwater sources in the Far North to help underpin mining development.
- The “Murray Darling Basin Plan Science Review” has developed an analytical framework to determine the impact of changed Murray River flow regimes in South Australia.
- “Water Requirements of Wetland Ecosystems in developing a comprehensive ecological response model in the South East of South Australia.

Contact Details:
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The National Centre for Groundwater Research and Training (the Centre)

CEO/Director Professor Craig Simmons

Vision
The Centre will develop into a groundwater institution of national and international standing with the capacity, through new people and knowledge, to better understand and manage our vital groundwater resources.

Mission
Our mission is to create a National Centre of Excellence in groundwater research and training that will enhance Australia's environmental, economic, social and cultural wellbeing. The Centre will achieve this by undertaking the critical scientific research needed to improve our understanding and management of Australia's groundwater systems. It will also train the next generation of expert researchers and professionals in groundwater related fields, filling a significant gap in Australia's current resource management capabilities.

Type of entity
The NCGRT is a Co-Funded Centre of Excellence of the Australian Research Council and the National Water Commission under the Special Research Initiatives Scheme. Subsequent to the core funding of $40 million, the Centre was awarded additional funds of $15 million to develop groundwater research infrastructure as part of the Commonwealth Government's Super Science (Marine and Climate) initiative, funded by the Education Infrastructure Fund and administered by the Department of Innovations, Industry, Science and Research. The Centre takes advice from an Advisory Board and is steered by several committees: International Scientific Advisory Committee (ISAC), Research Management Committee (RMC) and Industry Liaison Committee (ILAC).

Commencement date
The National Centre for Groundwater Research and Training was established in June 2009.

Board Members

Dr Tom Hatton (Chair) (Water for a Healthy Country Flagship, CSIRO), Mr Ken Matthews (Former Chair and CEO, NWC), Professor Suzanne O'Reilly (ARC National Ley Centre for Geochemical Evolution and Metallogeny of Continents), Professor Carl Schiesser (ARC Centre for Excellence for Free Radical Chemistry and Biotechnology), Mr John Ruprecht (Department of Water WA), Mr Neil Power (Chair, National Groundwater Working Group and interim Director of Goyder Institute), Dr John Radcliffe (Former National Water Commissioner & Former Groundwater Sponsoring Commissioner, NWC), Mr Garry Smith (Formerly of Goulburn-Murray Water; Advisory Board of E-water CRC; current Director, DG Consulting Pty Ltd), Professor Craig Simmons (Centre Director), Professor Peter Cook (Centre Deputy Director).

Commonwealth Observers
Dr Liz Jazwinska (Biological Science and Biotechnology, Australian Research Council), Mr Matt Kendall (NWC)

Partner Organisations
Aquaterra, CSIRO, Geosciences Australia, The NSW Department of Primary Industries, SA Water, Sinclair Knight Merz, The SA Department of Water, Land and Biodiversity Conservation, NSW Office of Water.

Collaborating Organisations
Flinders University (lead partner), Australian National University (Research node), University of New South Wale (Research node), University of Queensland (Research node), Charles Sturt University, James Cook University, LaTrobe University, Monash University, Queensland University of Technology, University of South Australia, University of Technology Sydney, University of Western Australia.

Entity overview

The research and training carried out by the Centre will play an important role in training the next generation of expert hydrogeologists and groundwater specialists. The Centre will bring together a critical mass of work-class scientists to provide postgraduate training and conduct internationally relevant research needed to improve groundwater understanding and use. We will also continue to run the successful national groundwater short course program.

Research focus

We have 5 Research Programs, 19 Sub-programs and 36 active research projects. We also have 26 post-doctorate, 36 PhD and 18 honours students pursuing a range of research activities. The Centre was established to support a range of national groundwater objectives through the delivery of innovative research that has the potential to transform groundwater policy and management practice.

Our Research Programs are:
Program 1 – Innovative characterisation of aquifers and aquitards
Program 2 – Hydrodynamics and modelling of complex groundwater systems
Program 3 – Surface water – groundwater interactions
Program 4 – Groundwater-vegetation-atmosphere interactions
Program 5 – Integrating socioeconomics, policy and decision support

Business model

The Centre's governance structure provides strategic management, direction, reporting and financial administration. This structure allows the Centre to build strong relationships with it stakeholders, the ARC and NWC, to deliver high quality information regarding their respective roles, decision making responsibilities and accountabilities and allow them opportunity to review and refine the Centre's strategic priorities on an ongoing basis. In addition to this, we will create opportunities for broader industry and public engagement in our strategy development process as part of our outreach activities. There are five strategic objectives in the areas of:

» Research
» Capacity Building
» National and International Linkages
» Outreach
» Management and Governance

Investment approaches

The NCGRT invests in various activities including:
» Undertaking research activities using our core funding from the ARC/NWC;
» Undertaking collaborative projects with our water industry partners;
» Undertaking externally funded projects.

R&D investment to date

During the five year period 2009-2014 the Centre will receive:
» $29.5 million from the ARC and NWC
» $15 million from Super Science (Marine and Climate)
» $10 million from University, Industry partners and State Governments; and
» $15 million in-kind contributions

Focus of investment

The Centre's main concentration of investment lies in our 5 Research Program areas. Significant investment activity is also taking place at the five Super Science sites across Australia, which are: Wellington (NSW), Namoi (NSW), Ti Tree (NT), Willunga (SA), and North Stradbroke Island (QLD).

R&D outcomes delivered

The Centre is still in its first 18 months of operation and therefore is still too early to see results in any of our programs as yet.

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Australian Government
National Water Commission

NATIONAL WATER COMMISSION

CEO Mr James Cameron

Mission

The Commission's role, as specified in the National Water Initiative (NWI) agreement, is to advise on national water issues and, in particular, to assist with the effective implementation of the NWI. The Commission was also assigned specific tasks, such as to provide:

- baseline assessments of water resources and governance arrangements nationally
- advice on the accreditation of state and territory implementation plans developed by each jurisdiction
- biennial assessments of progress under the NWI agreement and state and territory implementation plans
- advice on the performance of the water industry against national benchmarks, in areas such as irrigation efficiency, water management costs and water pricing
- advice on the impacts of interstate water trade
- advice on compliance with any outstanding commitments under the 1994 COAG strategic framework for the efficient and sustainable reform of the Australian water industry.

Under the Water Act 2007 (*Clth*), has an ongoing function to audit the effectiveness of implementation of the Murray-Darling Basin Plan and associated water resource plans. In 2009, the Commission was also assigned an assessment role for National Partnership Payments under delegation from the COAG Reform Council. To meet its statutory obligations and drive reform, the Commission delivers a differentiated and targeted suite of outputs:

- assessments of water resources and reform progress
- transparency reports to provide robust evidence and spur improved industry performance
- thought leadership products to catalyse action on specific reform issues
- practical tools to fill knowledge gaps, inform decision making and improve water management.

The Commission assists governments in implementing the NWI and administers the Australian Government's $250 million Raising National Water Standards Program (RNWS).

Type of entity

The National Water Commission (NWC) is an independent statutory body established to further the objectives and actions set out in the intergovernmental agreement on a National Water Initiative. The NWC is established under the National Water Commission Act 2004. The Commission consists of seven Commissioners who are appointed for their expertise in water resource policies, natural resource program management, relevant scientific disciplines, and public sector governance.

Commencement date

Establishing legislation enacted in 2004 by the Commonwealth parliament. The NWC Act sunsets on 1 July 2012 and requires a review be undertaken of the NWI and the Commission prior to this date.

Board members

The Commission has seven commissioners, all appointed for terms of up to three years. Each is an expert in water resource policies, natural resource program management, relevant scientific disciplines, or public/private sector governance. Four are nominated by the Australian Government and three by the states and territories.

Current Commissioners are: Ms Chloe Munro (Chair); Mr Lawrence Arthur; Professor Stuart Bunn;Mr Chris Davis; Ms Elaine Gardiner; Ms Sally Farrier; one position vacant.

Business Model and Research Focus

The *Raising National Water Standards (RNWS) Program* directs funds to high-priority activities to advance the NWI and improve Australia's national capacity to measure, monitor and manage its water resources. Investment supports projects where outcomes will be better if activities are undertaken on a national basis and where consistency or compatibility is required across jurisdictions. The program opened up in 2004 with a competitive grants program and then shifted its focus to strategically commissioned projects. The *National Groundwater Action Plan* was initiated by the Commission in 2007 under the RNWS Program to accelerate the groundwater reforms agreed to under the NWI. At 2009-10 more than 170 RNWS projects had been funded under 11 themes:

- Water accounting
- Emerging water markets
- Water planning and management
- Irrigation and other rural water
- Water-dependent ecosystems
- Integrated urban water management
- Groundwater
- Northern rivers
- National assessment of water resources
- Northern futures
- Knowledge and capacity building.

The Commission works collaboratively with a range of partners. These include federal, state and territory government agencies; irrigation, environmental, Indigenous, and industry stakeholders; and science and research organisations.

R&D investment to date

We estimate that between 40 to 50 per cent of projects funded under the RNWS program are primarily science based. Science related project support has been directed across the 11 theme areas.

A mix of large national investments, have been undertaken along with smaller targeted projects to support outcomes in theme areas. Examples of major national science related investments include: the Murray Darling Major Sustainable Yields project ($11m – RNWS funding) and the northern Australian TRACK project ($5m - RNWS funding). Examples of thematic focussed investments include the suite of projects to increase knowledge of water dependent eco-systems, and investments in filling knowledge gaps in relation to Australia's water balance such as evapotranspiration.

Under the Integrated urban water management theme a particular focus has been on science based projects to support water quality regulation and practice. The RNWS program is nearing the end of its life and further major investments are not anticipated.

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