



Independent Review 2016

Independent Review of the Australian Water
Recycling Centre of Excellence, April 2016



:: Independent Reviews

The Australian Water Recycling Centre of Excellence (the Centre) was established in December 2009 and officially launched in March 2010. Under a funding agreement with the Commonwealth Government, the Centre received \$20 million through the Government's National Urban Water and Desalination Plan.

The Centre and its founding participants – Seqwater, GHD Pty Ltd, Veolia Water Australia, The University of Queensland, Griffith University, the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and the University of NSW, together with Melbourne Water – collaborated to develop the Centre. This included the establishment of an Administering Organisation, Australian Water Recycling Centre of Excellence Ltd, and the appointment of a Research Advisory Committee (RAC) to guide research investment and evaluate and review project progress.

The Centre, as part of good governance and sound operational practice, initiated two independent reviews to assess its performance, progress and achievements.

The reviews, conducted by independent panels in 2013 and 2016, assessed the Centre's overall program of investment, and evaluated the national benefit that had resulted from the Centre's research and development activities. The 2016 review also commented on the legacy strategy being implemented by the Centre as part of its obligations to the Commonwealth and the broader water sector.

The purpose of the reviews was to assist the Centre and the Commonwealth maximise the economic, environmental and/or social benefits it generates for end-users and Australia by rigorous assessment of the Centre's achievements against the milestones, outputs and impacts specified and agreed in its Commonwealth Funding Agreement and Strategic Plans.

The reviews examined published and unpublished Centre reports and financial documentation, prior to interviewing a wide range of representatives from partner research, government, utility and private sector organisations, as well as potential adopters of the research outcomes, executives from peak water sector associations and the Centre Board and management.

This report is the second and final review of the Centre conducted in April 2016.

Independent Review of the Australian Water Recycling Centre of Excellence

:: Background

The Australian Water Recycling Centre Of Excellence was established in 2009 and officially launched in 2010. Under a funding agreement with the Commonwealth Government, the Centre received \$20 million over five years under the National Urban Water And Desalination Plan. The Centre has used these funds to leverage additional industry support of around \$30 million for a program of 42 national research and development projects involving 110 national and international partners.

In 2016 the Centre expects to fulfil its obligations to the Commonwealth Government and the Centre will be wound up by the end of the calendar year.

As part of its winding up process, the Centre commissioned an independent review of its performance over its life.

The independent review panel comprised:

- **Ken Matthews** AO, Chair – Former Chair and CEO of the National Water Commission
- **Jo Burgess** – Research Manager, South African Water Research Commission
- **Rob Skinner** – Director, Monash Water for Liveability (Monash University)
- **Roch Cheroux** – CEO, Suez Southeast Asia and CEO designate, SA Water.

The purpose of the review was to provide an assessment of the Centre's program of investment in applied research, and the national benefits of that research. The review also aimed to comment on the legacy strategy being implemented by the Centre as part of meeting its obligations to the Commonwealth and the broader water sector. The review was designed to help the centre assess issues such as:

- The effectiveness of its governance and management arrangements in terms of planning, decision making, reporting, conflict resolution and risk management;
- Its performance in research and development, commercialisation and utilisation activities;
- Its strategic direction and outcomes in the context of the end user engagement;
- Strategies for the remaining grant period and beyond to maximise the benefits of recycled water to end users and Australia.

The Panel approached its task by examining a wide range of documents, reports and other published and unpublished material associated with the Centre. It then conducted an extensive and intensive round of interviews with 36 non-staff stakeholders, including the Chair, and current and past board members. In addition, the Panel had detailed discussions with the CEO and staff of the Centre. Interviews were conducted from 12 to 14 April 2016.

This report summarises the Panel's findings. The Panel has already provided feedback, consistent with its report, directly to the Chair and Chief Executive of the Centre.



2016 review panel from left: Professor Robert Skinner, Chief Executive Officer of Monash Water for Liveability (Monash University), Dr Jo Burgess, research manager of the Water Research Commission in South Africa, Mr Roch Cheroux, CEO South East Asia at Suez Environment, and Chief Executive designate at SA Water and (front) Panel Chair, Mr Ken Matthews AO, former Chair and CEO of the National Water Commission.

:: Overall Assessment

The Panel’s overall assessment of the performance of the Centre is very positive. As a result of the Centre’s work, water recycling has expanded across Australia. More importantly, the policy and investment environment for water recycling and water re-use in Australia has been materially improved. When the next drought occurs, decision-makers, relevant institutions, regulatory authorities, and the public will be in a better position to move to recycled water than would have been the case had the Centre not existed. The \$20m of taxpayers’ funds invested in the Centre has been money well spent.

:: More Detailed Assessment

The Centre did more than invest in research to support specific water recycling projects. It positioned itself as a national change agent and the Panel was impressed that it was prepared to take on some of the most difficult obstacles to water recycling, including longstanding regulatory issues and the challenge of public acceptance of water recycling. It made considerable efforts to build a community of water recycling practice in Australia. It forged important connections among different players on the national recycling stage. It identified regulations which were slowing the uptake of water recycling and reuse and initiated processes to improve them.

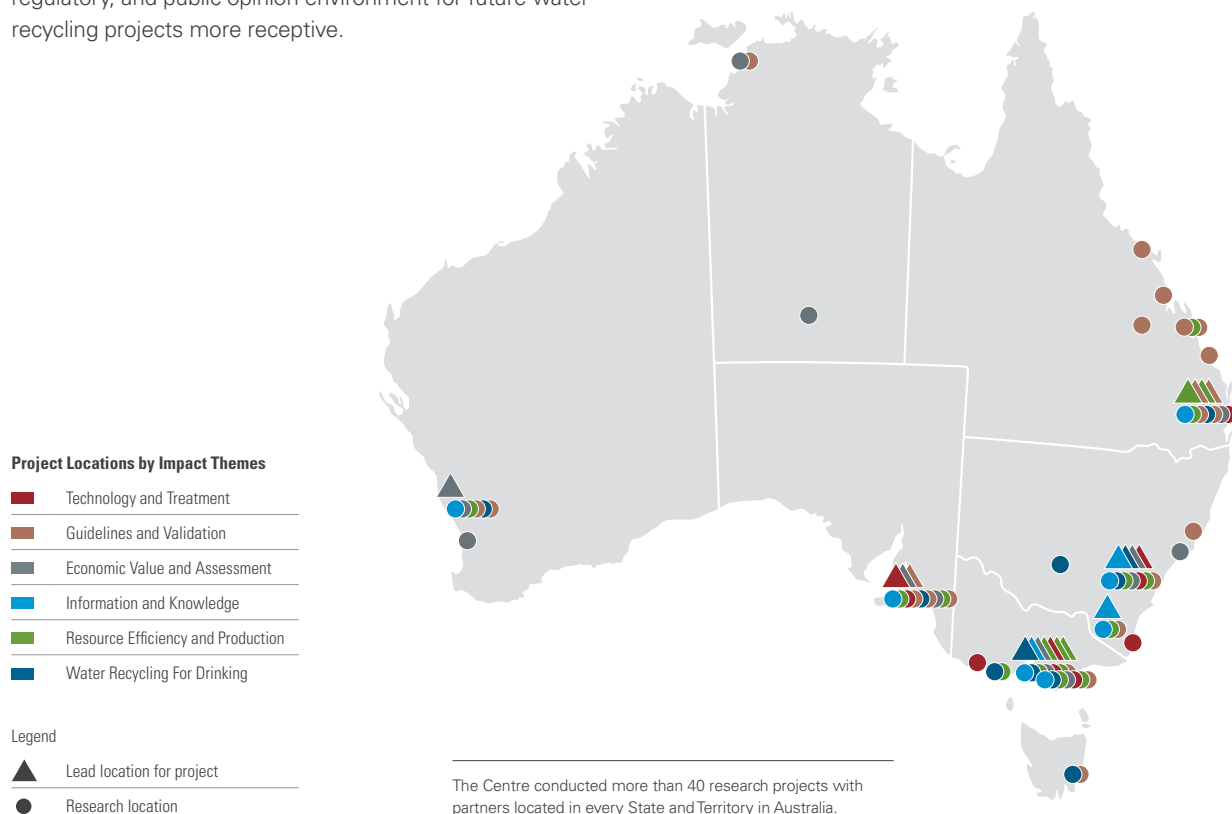
In short, the Centre went beyond the conventional academic, technical and scientific research that may have been initially expected of it, and focused also on work to make the policy, regulatory, and public opinion environment for future water recycling projects more receptive.

In particular, the Centre made good and necessary progress in integrating social science research with more conventional technical and scientific research relating to water recycling.

The Centre leaves an important legacy of knowledge, assessment and decision-making tools, processes, and water recycling-related resources including communications resources. The Panel considers it important that this legacy be fully completed, documented and preserved, and that adequate provision be made to maintain the resources and update as necessary in the future.

The Centre’s legacy also includes some good practice ideas about research and development project management and Centre of Excellence governance. The Panel provides more detail about these later in the report.

However, the Centre did not succeed at everything it attempted. The Panel would have liked to have seen more evidence of sectoral capacity building. Also, the Centre found some difficulty in attracting large private companies to participate in the work of the Centre. The Panel has doubts also that either the Commonwealth Government or the Queensland host government, extracted as much benefit from the work of the Centre as could have been the case. The Centre tried, but has not to date, succeeded in fostering improved institutional arrangements to deliver urban water R&D in Australia. More detail of these challenges and problems are provided later.



:: Panel Observations about the Work Program

In the first eighteen months of its life, the Centre worked with a broad range of stakeholders to develop a needs-driven Strategic Research Plan. The plan articulated four goals which then guided the activities of the Centre for the remainder of its life:

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 'alternative water' for augmenting drinking water supplies

Goal 4: a national knowledge, training and education program for water recycling is established.

The Centre was strongly of the view that, following its widely inclusive process to develop its work program, the four goals were goals for the water recycling sector as a whole, not just goals for the Centre itself. Developing such sectoral goals is a good example of the leadership and catalytic roles which the Centre undertook throughout its life.

The Panel received feedback from a number of stakeholders that too much time was taken at the outset to develop the Centre's Strategic Research Program and project management arrangements. This setting-up time reduced the time available for delivering the real research program. In some cases projects had only 2 years of actual research before all projects were required to be finished by the end of the Centre's planned five-year life in mid 2015. (However this problem was ameliorated to some extent by the private sector co-funding obtained by the Centre which enabled it to extend its life to almost seven years.)

On balance, the Panel considers that investing time at the beginning to ensure a needs-driven research agenda was necessary and ensured relevance of the Centre. The main themes and goals of the work program were well conceived and well understood by stakeholders and provided a sound basis for program management. There was wide stakeholder involvement in the design of the Strategic Research Plan and a good spread of projects covering the entire value chain of water reuse. In particular, the selection of *WaterVal* (formerly known as NatVal) and NDEEP as flagship projects was insightful. Overall, the Panel considers good judgement and good process was followed in the setting of the research agenda.

A small number of stakeholders wondered whether the Strategic Research Program had unnecessarily constrained the Centre over its 6 1/2 year life. They asked whether issues that emerged later in the life of the Centre were adequately handled. Examples included a growing emphasis over the years on stormwater recycling, the emergence of coal seam gas-related issues, and the water– energy nexus. The Panel saw some merit to these arguments but noted that the Strategic Work Program had a significant focus on higher level obstacles the water recycling which would have benefited such emerging issues as much as they benefitted recycling issues more evident at the commencement of the Centre's life.

The Panel considered the general quality of Centre projects to be good. Overall scoring of the Centre's portfolio of 42 projects was above average, although the success of individual projects was mixed (see the Centre's Research Quality Assessment), with four projects being assessed as Excellent whilst four projects were assessed as Sub optimal and one as Poor. However the Centre could reasonably argue that it has made substantial progress towards achieving its vision of being recognised as a world leader in research and promotion of sustainable water recycling. The Centre is certainly leading research and promotion of water recycling in Australia and is well recognised in the USA – particularly for strategy and policy planning.

The Centre's greatest successes were in the big programs addressing national validation processes for water recycling technologies, and public attitudes to water recycling (Goal 2 and Goal 3) - yet because of their size, these also exposed the Centre to its greatest risks. Goals 2 and 3 are real flagship achievements and are seen by most stakeholders - and by the Panel - as the most important legacies of the Centre. The tools generated will help people make better informed decisions, and it is important that they be maintained and updated in the future. The Panel sees them as essential cornerstones for further development of water recycling in Australia but they will need a champion and an inclusive and binding stakeholder governance framework to be carried forward and used to their full potential.





Because of the relatively short lifespans of most Centre projects there was a tendency to stick with, and attempt to turn-around, poor performing projects rather than undertake dramatic scope changes or to abandon them. This problem may have been accentuated by the originally-announced five-year lifespan of the Centre itself. While the five-year timeframe did keep performance pressure on projects, the Panel's overall view is that a five-year timeframe for the Centre was inadequate for the task, and put negative pressures on the time/quality trade off in certain projects. It constrained the nature of the research program and may have excluded certain more challenging research projects. The Panel would recommend any future such research body be established with a longer timeframe - perhaps eight years, if not open ended (but subject of course to continuing review).

Most stakeholders were reasonably satisfied with the quantum of funds provided to the Centre (\$20 million over 5 years). A few suggested that more would have been better. It is the Panel's assessment that limited research capacity in Australia meant that the Centre couldn't have spent much more (responsibly) than the budget provided. The Panel noted, however, that the Centre's Research Gap Analysis did identify further areas of potentially fruitful research.

The Panel considered there had been an excellent focus on project delivery, but suggests there could have been more focus on capacity building as a contribution to the water industry as a whole. Preparing and documenting a specific strategy to build R&D and Innovation capacity may have been constructive (instead of leaving it implicitly within Goal 4). Despite the absence of such a formal strategy, a good deal of anecdotal evidence was provided to the panel that the Centre was successful in bringing together disparate groups who otherwise would not have collaborated; this is crucial for the development and maintenance of a solid community of practice, but has not been formally measured or documented.

The panel noted that overall, there had been only limited participation in the Centre's projects by larger firms of the private sector. One contributing factor to this may have been the Centre's approach to intellectual property (IP). From the outset the Centre required that all intellectual property remain vested in the Centre (although licenses would be readily available). Some stakeholders argued that this posed a disincentive to private sector participation. Another factor which may explain the relatively low profile of private sector involvement was the relatively large emphasis on public good research – the results of which are not easily capturable by an individual private sector firm (e.g., regulatory reforms and research into public attitudes to water recycling). For its part, the Panel considers that the strong emphasis on public good research was appropriate and necessary. Given the experience of the Centre, it may be worthwhile for governments to consider whether there are additional ways to encourage the involvement of larger private sector firms in water sector research.

Both public-good knowledge and IP of value to the private sector generated by Centre projects are already in active use in the public and private sectors both in Australia and the USA, and will shortly be in use in South Africa - this is an important measure of true impact.

An important strategic decision was taken in the early days not to create an organisation that would be self-sustained by the revenue from the IP it would generate. This was a far-reaching decision which set the tone and timeframes for all projects. In the Panel's view this decision enabled an appropriate proportion all the Centre's subsequent work to be focused on public good which, with the benefit of hindsight, has proved to include the most valuable outputs of the work program.

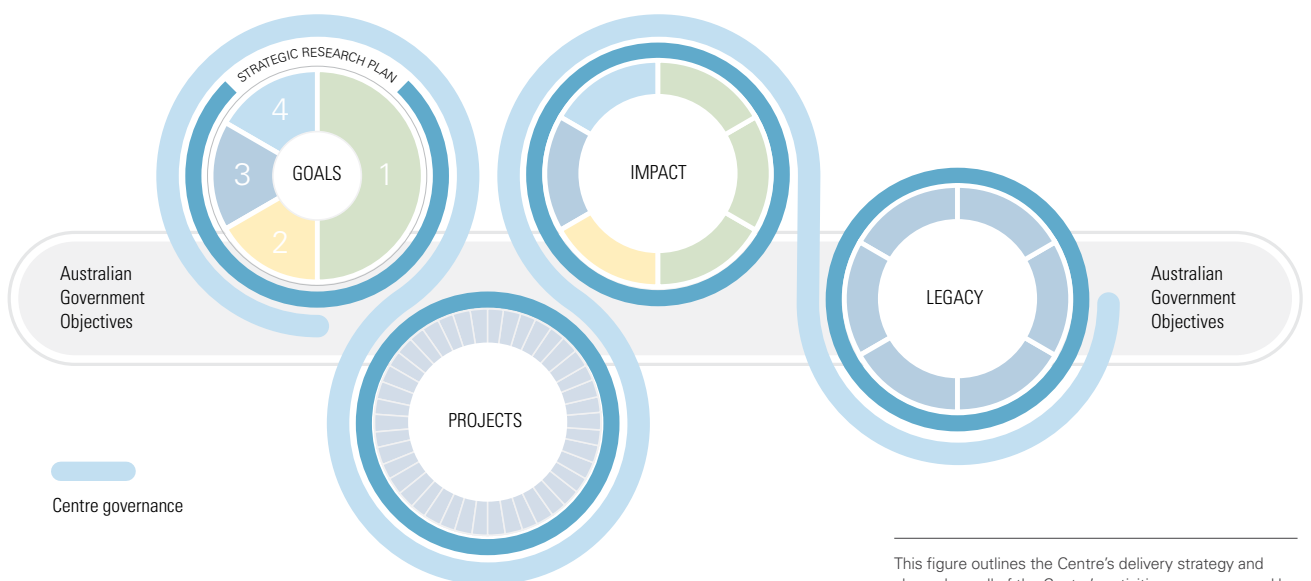
:: Governance Issues

Changes of governments (State and Commonwealth) and changes in water sector institutional arrangements meant that the membership and focus of the Board changed repeatedly in the early years of the Centre's life. This was compounded by frequent changes of personnel particularly among government agencies responsible for, or dealing with, the Centre. These changes placed a particular load on the CEO, and more recently the current Chair, to provide the necessary continuity of strategic direction.

To the Centre, the Commonwealth Government appeared to show little interest in the Centre's progress, or how the application of research outcomes was being managed. In discussions with the Panel, the Commonwealth explained that the Government was monitoring the work of the Centre from afar and the perception that they were uninterested was because they were satisfied with the work being undertaken by the Centre. Even so, the Review Panel considers that the 'hands-off' approach of the Commonwealth likely led to the Centre playing a more active catalytic - almost reform leading - role that would more normally have been played by a mainstream policy-related arm of government. It may also be that opportunities were lost for the Government to take up the products and processes initiated by the Centre to progress the national water reform agenda. One example is the national technology validation project. Given that the *WaterVal* and NDEEP projects are likely to continue under different management after the closure of the Centre, it is not too late for governments to now pick up this opportunity.

A further important governance issue is the unusual reliance of the Centre on the personal contribution of the CEO. Stakeholders were uniform in stressing the singular importance of the CEO in the Centre's success. Indeed, many stakeholders noted his leadership contribution to the water sector as a whole. However, perhaps because of the size and limited life span of the organisation, little attention was paid to long-term succession planning for CEO. This was a 'key person risk' not well managed over the life of the Centre. Fortunately the risk did not materialise.

More broadly, the Panel noted the Centre's use of a formalised risk assessment and management framework involving reports to the Board through the CEO. The Panel noted examples of remedial action on lagging projects presumably as a consequence of this process. However, the Panel concluded that, in practice, the formal risk management framework did not seem a high impact management tool and risks were likely managed in a less structured way by a very competent and hands-on CEO and, in later years, Board.



This figure outlines the Centre's delivery strategy and shows how all of the Centre's activities were governed by the **Corporate Objectives** and strategic direction set and overseen by the Board of the Australian Water Recycling Centre of Excellence.

:: Program and Project Management Processes

As noted previously, the Panel saw a number of strengths in the approach taken by the Centre to its program and project management. Because these may be useful for similar organisations in the future, the panel summarises some key points below.

- The Centre’s approach to defining research scope (featuring detailed consultation with major stakeholders) was excellent. Phasing of activities was also well designed, including a generous initial period to get the objectives right and planning for a final period sufficient to ensure IP generated by the Centre would be properly looked after.
- The vocabulary used in the planning process to define activities/directions was sometimes excessively elaborate and confusing (e.g., Goals, Objectives, Themes, Research Needs, Priority Research Topics, etc).
- Funds allocated to operating and administering the Centre (12% of overall portfolio value and no more than \$2m of the Commonwealth’s \$20m) was kept well under control but at the same time such arbitrary limits may have posed a limiting factor on risk management.
- Although most internal processes were well documented, relationships between the Project Management teams, the Project Advisory Committees (PACs) and the Research Advisory Committee (RAC), and at times the Board, do not seem to have been clearly understood by all parties, sometimes generating confusion or looseness in project delivery. Nevertheless, the access of industry to academia and vice versa was well served by the PACs and RAC (perhaps more than the formal personnel exchange program).
- The RAC worked well, and many interviewees considered this was due to the inclusion of independent members. Including regulators and end users of research products in the PACs and RAC is good practice for funding bodies and where appropriate should be standard for a research body of this type. The RAC contributed data and guidance as well as providing project management / assessment services.
- There was a perceived potential for conflicts of interest inside the RAC due to the small community of practice in Australian water recycling. This is impossible to avoid so mitigation measures, such as the inclusion of independent members, are required. The Panel considers the Centre handled the issue satisfactorily.
- Although as noted above there was sometimes confusion about the respective roles of the RAC and the Centre Board, the Panel concluded that the formal roles were defined appropriately: the Board was to focus on governance and strategic leadership; the RAC was to focus on the content of the research program within strategic guidance provided by the Board. The lesson seems to be for closer liaison during month-to-month operations to ensure mutual understanding of respective roles.
- In relation to the project selection process, some stakeholders questioned if probing /assessment of proponents’ capacity to deliver the project was sufficient. However scientific rigour of project selection was transparent and good, and feedback to proponents was reported by proponents to be adequate.
- The Panel assessed that the first year of Centre operations was significantly under-resourced. The success of early years is attributable to the outstanding dedication of the CEO, with Ian Law providing very valuable input to the extensive stakeholder consultation process. Under-resourcing was corrected in later years although the operation continued to be ‘lean’ in comparison with similar research organisations.
- Contract documents had to be developed from scratch to meet differing needs and expectations of various parties (e.g., universities and contractors). This took valuable time and was an irritant to some proponents. A lesson for the future would be to start from a comprehensive contract template already known to be acceptable to most parties. The Centre’s contractual principle that the precise methodology to be used in each project should be driven by the proponents is good practice for funding bodies and should be standard.
- Considerable emphasis was given to ‘legacy management arrangements’ -how best to maintain the data, knowledge, tools and resources generated by each of the Centre’s projects. In the case of continuing projects such as *WaterVal* and *Water360* the Centre has been innovative in designing ways, including incentives, to recruit a new champion to carry forward the work to completion.
- The Panel considers the program and project management processes were of such value that they should be carefully documented and made available to future organisations with similar operations.

:: Suggestions for the Remainder of the Centre's Life

The panel offers the following suggestions for actions the Centre could take before it is wound up.

- 1 Document carefully the processes used by the Centre for its program and project management and make them available publicly.

- 2 Complete a report on human capacity development stimulated by participation in Centre activities (number and type of students, postdocs and staff upskilled).

- 3 Finalise the transfer of IP for any project not already completed including clauses in the contract to encourage use and promotion of the IP.

- 4 Complete a project-by-project assessment of the outcomes, including public reports and statements from industry stakeholders to attest to the usefulness and success of projects.

- 5 Undertake a final assessment of the four Strategic Research Plan goals and invite statements from relevant industry stakeholders to attest to the relevance and usefulness of the goals.

- 6 Deliver a comprehensive communications strategy to explain the overall outcomes of the Centre over its life. The strategy should be directed at the Commonwealth Government, major stakeholders, and informed community and media.

- 7 In relation to the proposed new IWC/WSAA/WRA consortium, finalise the Constitution of the Consortium (including its objects) and specify clear responsibility for the consortium to carry forward and continue to invest in the *Water360* and *WaterVal* projects.

- 8 Engage with the Commonwealth (Chair to Minister in first instance) to brief the Government on the successes of the Centre.

- 9 Celebrate the achievements of the Centre. Consider an international conference to close the Centre. Ensure proper recognition and celebration events – inviting the Commonwealth to be part of the final chapter.

:: Conclusions

The Panel concludes that:

- 1 The overall standard of performance of the Centre has been very high. The Centre has made substantial progress towards its vision of being recognised as a world leader in research and promotion of sustainable water recycling.

- 2 As a result of the work of the Centre, water recycling has expanded across Australia (and abroad) and the policy and investment environment for water recycling and water reuse has been materially improved. When the next drought occurs Australia will be in a better position to utilise recycled water than would have been the case if the Centre had not existed.

- 3 The \$20 million of taxpayers funds invested in the Centre has been money well spent. Given the limited research capacity in Australia it is unlikely that the Centre could have invested much more (responsibly) than the budget provided.

- 4 The Centre did more than investing in research to support specific water recycling projects. Unusually for a research body, it positioned itself as a national change agent and played an important leadership and catalytic role within the water recycling sector, and the wider water industry as a whole.

- 5 The Centre made good and necessary progress in integrating social science research with more conventional technical and scientific research relating to recycling.

- 6 The Centre leaves an important legacy of knowledge, tools, processes and resources which should be maintained, applied and further developed.

- 7 The Centre has developed many good practice ideas about research and development project management which should be made available to similar research management bodies in the future.

- 8 The Centre's likely most valuable legacies are its big programs addressing national validation processes for recycling technology, and public attitudes to recycling (Goal 2 and Goal 3). It is critical that these programs be carried forward.

- 9 It is unlikely the Commonwealth Government or the Queensland state government extracted maximum potential value from the work of the Centre – but there is still time to do more work in this space.

- 10 A number of important actions identified in the report remain to be completed before the Centre is wound up in the second half of 2016.

:: 2016 Independent Review Panel



Ken Matthews

AO (Chair)

Ken, a consultant in water and government issues, retired as Chair and Chief Executive Officer of the Australian National Water Commission in October 2010, positions held concurrently since March 2005. In these roles, he was responsible for working with the State and Territory governments of Australia to implement the National Water Initiative inter-governmental agreement to improve national water management. Prior to the Commission, Ken held a number of senior executive positions with the Commonwealth government, in a career that spanned more than 30 years.

He has been elected a Fellow of the Institute of Public Administration – Australia, a Fellow of the Academy of Technological Sciences and Engineering, and a Fellow of the Australian Institute of Management. He was awarded a Centenary Medal in 2001 for services to public administration and in 2005 was appointed an Officer of the Order of Australia (AO).



Roch Cheroux

MEngBus

At the time of the Review Roch was CEO Suez Southeast Asia and CEO designate of SA Water. He has 25 years of experience in the Water Industry in design, construction, financing and operating activities in line and executive management positions and has various senior roles at leading water companies in Australia, Estonia and France.

His career has mainly been with the private sector, in companies operating or constructing water assets and providing services to customers on behalf of public water utilities.

Roch's executive experience covers a broad range of activities including company turnaround, culture change program, customer experience improvement program, operational excellence program, initial public offering, merger & acquisitions.

Roch holds a Master degree in Engineering and Business Management.



Dr Jo Burgess

MRSSAf, BSc(Hons), MRes

Jo Burgess works as a research manager at the Water Research Commission in Pretoria, South Africa. She manages programmes of research in water reuse and mine water treatment and management. Her background is in environmental biology; from a BSc (Hons) in the subject she progressed to a Master of Research in Water Pollution Control Technology and a PhD in Environmental Biotechnology, both at Cranfield University in England, and then went to Rhodes University in South Africa.

Jo was Head of Biotechnology at Rhodes until 2008, when she left to join the WRC and now is engaged in funding, facilitating and co-ordinating projects to interdigitate South African water research. Jo founded the SA Young Water Professionals, which she led from 2008 to 2010, and in 2014 became chairman of the board of the Water Institute of Southern Africa. She is a Fellow of WISA, a Member of the Royal Society, and a Fellow of the International Water Association. Jo has published 100 research outputs in total, comprising 55 journal articles, five book chapters, 50 conference presentations / proceedings and two public research reports.



Professor Rob Skinner

BE(Civil), MSc

Rob has extensive executive experience in the Australian water industry and his current roles include being Professorial Fellow and Director of Monash Water for Liveability (Monash University), Director of Yarra Valley Water, Board Member of the International Centre of Excellence for Water Resources Management and Chair of WaterAid International.

Former roles have included Managing Director of Melbourne Water Corporation (6 years) and Chief Executive Officer of Kingston City Council (10 years). In addition, he was Chairman of Southern Rural Water and Chief Executive Officer of the Dandenong Valley and Western Port Authority. Other roles have included Chair of the Victorian Stormwater Advisory Committee, and Manager of Parliament and Government in the Victorian Department of Premier and Cabinet. Rob has been a strong advocate for the adoption of water sensitive cities principles in the planning of cities and is chair of the international Water Association's 'Cities of the Future Program'.

