

Recycled water for drinking: Purified recycled water in the ACT: deferred in favour of alternative

Recycled water for drinking was identified as an option to augment the Australian Capital Territory's diminishing and climate-dependent water supply in 2007. A demonstration plant was planned but the ACT Government deferred its construction in favour of alternative options which appeared cost-effective.

The drivers

The landlocked ACT draws its water supply from three catchments — from dams in the Cotter and Queanbeyan catchments, and direct from the Murrumbidgee River. Traditionally, inflows to the ACT's dams have been well above average demand. However, prolonged drought from the mid-1990s to 2010 affected the water supply and, when bushfires struck in 2003, the supply reached crisis point.

Dam levels fell from 80 per cent in January 2002 to 43 per cent June 2003. After a temporary reprieve in 2005, dam levels dropped to 31 per cent in 2007.

Seawater desalination was not seen a viable option because of the cost to transport seawater from the coast, and the higher operating costs compared to purifying municipal wastewater.

The proposal at a glance

An 8 megalitre per day recycled water demonstration plant was planned and designed to prove the reliability of the water purification process under real operational scenarios.

If a full recycled water purification scheme became necessary, the treated water could be stored in Cotter Dam.

The demonstration plant would be operated by the territory-owned corporation, ACTEW (now Icon Water), which provides water and sewerage services in the ACT.



The path taken

No new dams

In 2002, the ACT Government announced it would develop a water security strategy that would aim not to build another dam for water supply. The *Think water, Act water* strategy, released in 2004, was consistent with the original announcement — the focus was on saving water and reusing stormwater and wastewater.

Future water options

In April 2005 ACTEW presented its 'Future Water Options' report to the ACT government. In it, they recommended:

- building a new Tennent Dam (159 GL or 43 GL)
- enlarging Cotter Dam (from 4 GL to 78 GL)
- building the Tantangara transfer, whereby water is transferred from the regulated Murrumbidgee River to the ACT via the Snowy Mountains Scheme (25 GL/year)

The government, having bought some time through other initiatives — in 2004 ACTEW had implemented the Cotter to Googong Bulk Transfer project and upgraded the Mt Stromlo Treatment Plant — did not accept the recommendations. The government announced it would seek independent technical advice, conduct a whole-of-government review of the report, and consult with the ACT community.

In February 2006, the government announced it would not proceed with ACTEW's Future Water Options recommendations.

Changing climate? Bigger dam

In the same year, 2006, in response to worrying climate projections for the ACT, ACTEW conducted a water security review. In July 2007, at a time when dam capacity had dropped to 31 per cent, ACTEW presented its findings to the government, once again recommending that the Cotter Dam be enlarged and the Murrumbidgee to Googong pipeline be built. It recommended further analysis of an advanced recycled water facility and the Tantangara water transfer project.

Water purification is feasible

The ACT government was interested in the viability of purifying wastewater, since this was the only climate-independent option available. In April, 2007, they established the Expert Panel on Health to investigate it. Three months later, after consulting the community, the panel reported that, subject to stringent health rules and the enlarging of the Cotter Dam to store the treated water, an advanced water purification plant was a feasible way of increasing the water supply.

Demonstration plant put on hold

In October 2007 the ACT Government announced that ACTEW would undertake the enlarged Cotter Dam, Murrumbidgee to Googong Pipeline, and Tantangara Dam projects.

Design of a recycled water purification plant for research and monitoring purposes was also approved on the basis that it was the option least dependent on the climate, and because the Water Security Taskforce, the Expert Panel on Health, and the eWater Cooperative Research Centre all believed that recycled water for drinking warranted further analysis.

ACTEW progressed the demonstration purification plant to the design stage.

In late 2008 the ACT government decided to delay consideration of construction of the demonstration water purification scheme.

In 2010 the Millennium drought broke and combined dam levels reached 100 per cent. The Murrumbidgee to Googong pipeline was completed in 2012 and the enlarged Cotter dam was completed in 2013.

Engaging the community

In 2007, ACTEW carried out a three-month community consultation program — Water2WATER — to find out what ACT and Queanbeyan residents thought about recycled water for drinking, and particularly with a demonstration plant to trial the purification process.

Consultation included media advertising and editorial, community briefings, community forums, targeted stakeholder meetings, information displays, an online community survey, a project office and call centre, a telephone survey, feedback forms and a website.

A telephone survey demonstrated that 75 per cent of the community were either positive (53%) or conditionally positive (22%) to the recycled water purification proposal.

Results indicated that the community was open to the idea of purifying water to augment their water supply provided the following conditions are met:

- major issues such as public health risks, cost, water quality and quality assurance are addressed
- extensive community and stakeholder consultation is undertaken in the planning and approval process

During 2008, ACTEW continued its program of community engagement. Community awareness and support for the water purification scheme was initially high, but began to fall after the focus shifted away from the water purification scheme and onto other water supply options, such as enlarging the Cotter Dam.

Barriers to success

Delays in securing comprehensive economic and technical information on each water supply option led to protracted and often competing decision-making.

Water purification was identified as a source augmentation option but was not implemented as more cost-effective alternatives were identified.

As ACT's dam levels dropped, water supply planning became a politically heated topic. A considerable number of water supply announcements, strategies, reviews and assessment projects were undertaken by government, statutory, and research agencies during the Millennium drought, which had impact on decision efficiency.

Engagement with the community on the concept of water recycling for drinking only ramped up toward the end of the Millennium drought. This made it difficult to adequately build public support for potable reuse as a viable option for augmenting ACT's drinking water supply.

The Expert Panel on Health found that the original Cotter Dam was too small (4 GL) to store purified water from a new plant, so it would have needed to be enlarged anyway. Perhaps, if the true cost of the Cotter Dam project had been known in 2007, the mix of water security projects chosen may have been different.

Lessons learnt

- Identify all water security risks and have well-developed response strategies. Rainfall is not the only risk, as the ACT discovered. The 2003 bushfires seriously affected its water supply.
- Assess cost-effective options. For inland cities, desalination may be uneconomic because of the coastal infrastructure and pumping cost of transporting seawater inland, so potable reuse can be a viable climate-independent option. Securing an urban water supply involves assessing multiple solutions appropriate to each location.
- Communities may need several years to have an active, informed discussion about recycled water for drinking before they can decide it is a safe, viable water supply option. Public acceptance is a key issue that must be addressed for potable reuse to become a strategy for a sustainable water supply.
- Develop an effective community education program. The experience of designing and delivering communication and education programs has shown that water utilities have a wide range of options for changing the community's attitudes toward recycled water purification.
- Use positive language. Positive terminology and effective explanation of recycled water in an urban water management context — as part of the water cycle — increases broader acceptance of water recycling for drinking.
- In presenting a strategy for water security to the community, each water utility attempts to put forward a reasoned, rational argument that supports its strategy. In the case of ACTEW, more than 30 options were considered before a decision was made to proceed with, among other projects, the design of a demonstration water purification scheme.

Produced by the Australian Water Recycling Centre of Excellence, a national partnership of industry, research and government organisations working to develop water recycling solutions for Australia's future. www.australianwaterrecycling.com.au