

Rainwater Harvesting Association of Australia and Urban
Water Cycle Solutions
15 December 2016



RAINWATER HARVESTING, ISSUES AND DESIGN

RAINWATER IS A GIFT FOR THE WISE

Rainwater Harvesting Awareness



- Rainwater harvesting represents decentralised storage and supply providing whole of catchment benefits not owned or managed by the traditional water industry
- Rainwater Harvesting has the potential to avoid the need for billions of dollars of desalination and other infrastructure in Australia, including a strong contribution to stormwater management

Issue 1 – There is no problem?



- Australian household expenditure on water services increased by 91% since 2008 but water demand only increased by 23%:
- This is a major household welfare, national productivity and governance issue
- SA revenue from household water services has increased by 184% but water demand only increased by 8% since 2005 (Coombes)

Issue 2 – Rainwater does not count?



- 45% of households in Adelaide own a rainwater tank, over 5 million Australians own a rainwater tank (ABS 2013)
- Rainwater represents 15% of household water use in South Australia (estimate: ABS, 2016)
- The value of rainwater in 2014/15 was \$88 million, in South Australia (estimate: ABS, 2016)
- Rainwater is a major source of water in Australia.

Issue 3 – Rainwater could make you very SICK?



- The CSIRO have reported on dangerous bacteria and virus present in rainwater tanks and suggested there could be a health risk
- The CSIRO does not provide a balanced discussion about the body of research discussing the treatment train preventing disease transmission or the research showing rainwater drinkers have the same or better health levels than the general community
- Over 3 million Australians drink rainwater every day, one in four households have a rainwater tank, where are the sick people?

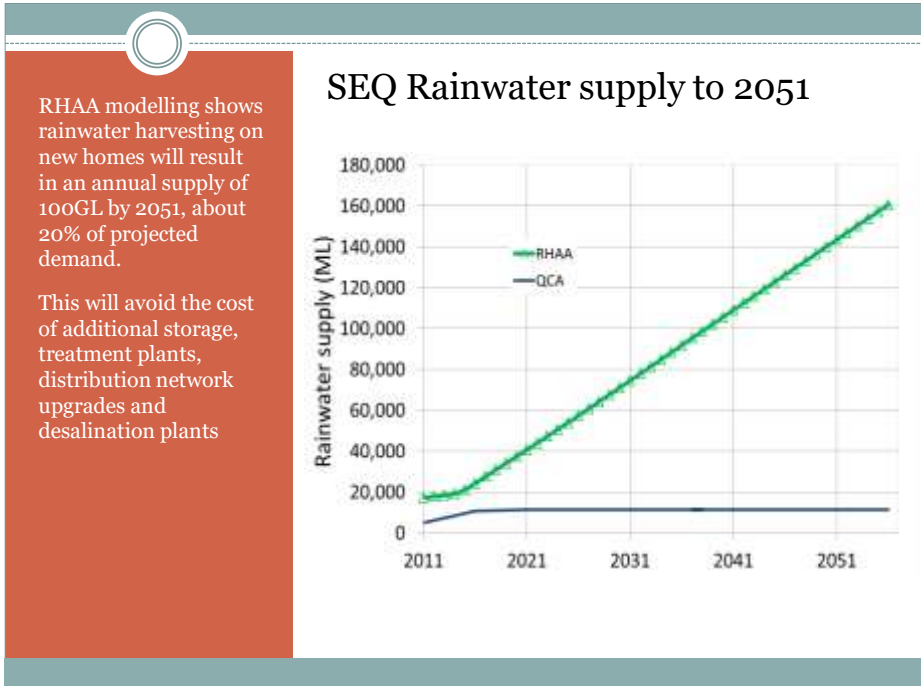
Issue 4 – Rainwater Harvesting is not economic?



The 2012 Queensland Competition Authority cost benefit report made a small assumption

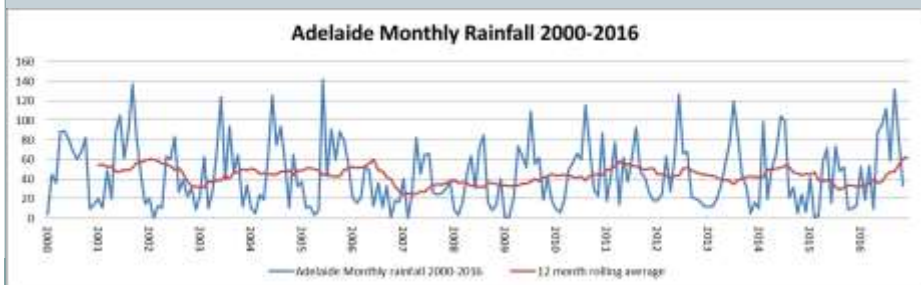
- In the modelling for rainwater harvesting legislation all pumps would fail after 10 years and 0% of them would be replaced
- As a result water savings were underestimated by 90%, as were operational savings of \$3.5B
- The Coombes/RHAA estimate of the benefit cost ratio is 2.1:1

These findings are published in the Australian Journal of Water Resources, have been peer reviewed and discussed in the Australian Senate

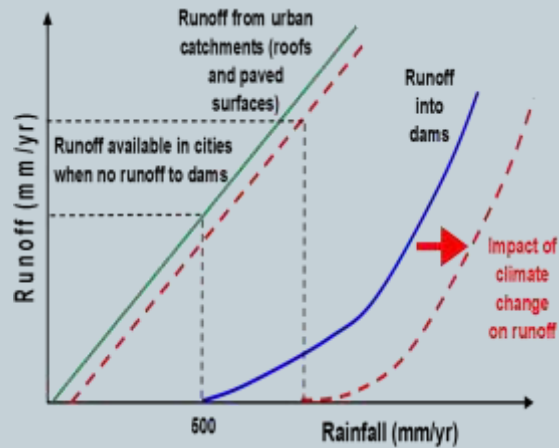


Issue 4 – No urban rain in a drought?

- Drought is defined by soil moisture, not rain
- All capital cities enjoyed reliable rainfall during the Millennium drought
- Urban areas within Adelaide experienced consistent rainfall throughout the drought. (BOM 2016)



Rainwater Harvesting vs Catchment Harvesting



Coombes & Kuczera, (2003)

Issue 5 – Rainwater harvesting does not reduce stormwater infrastructure?

- Multiple physical and ecosystem responses in catchments
- Distributed “within catchment” solutions provide whole of system cumulative waterway and flooding benefits

Adelaide

Reduced runoff ML/yr
7,129

TSS (tonnes)
829 (6,460)

TP (tonnes)
1.7 (9.0)

TN (tonnes)
11.8 (65.5)

The Opportunity of Integrated Systems

Coombes & Rosso, (2016) Australian Rainfall and Runoff

Rainwater Harvesting Design Specification



- Joint project Urban Water Cycle Solutions and RHAA
- The objective of the project is the best outcome for the householder, the design specification does not reference specific products or brands
- The specification is evidence based and relies on 1,000s of independent national observations and research not funded by water utilities

Rainwater Harvesting Design Specification

- The project arises from private industry seeking independently researched advice on rainwater harvesting design
- The Design Specification is in the process of being published for comment
- Previous publications on this topic include
 - HB230
 - Design guidelines originally developed by Professor Coombes for the Central Coast and Lower Hunter State Environmental Planning Policy (SEPP) – used by most Australian Councils.
 - NSW Department of Planning BASIX guidelines for rainwater harvesting

Rainwater Harvesting Design Specification



The Design Specification is designed to be used

- As guidance for homeowners
- As a document to be provided to plumbers and builders to be applied in accordance with local standards and regulations
- As a reference document for State and Territory policy
- As a reference document in Land Use Planning Schemes
- As content for land use development covenants

Rainwater Harvesting Design Specification



- The Design Specification is in two parts, a diagram of a rainwater harvesting system cross referenced with an explanatory User Guide
- The Design Specification is in plain english
- The Design Specification treats the Rainwater Harvesting System as a system
- A well designed Rainwater Harvesting system will generally provide good quality water and only need limited maintenance and replacement



- Roof - 50% area or 100sqm
- Roof gutters – comply As 3500, must slope to downpipes
- Accessible rainhead leaf diverter
- First flush diverter
- Charged line drain point in geographic regions where required



- Tank –poly, concrete and steel standard
- Mosquito protection
- Tank inlet – below rainheads
- Tank overflow – can be directed to yard or ground area able to absorb overflow
- Tank size- 3000 - 5000 litre
- Outlet to house supply – 50mm above base of tank



- Pump – key asset, choose wisely
- Connect to outdoor, toilets, washing machine and hot water
- Clear instructions and recommendations for installation
- Pump selection – internal, external
- Pump suction
- Mains Water Bypass and Top Up
- Filtration
- Serviceability and owner checks

Rainwater Harvesting Design Specification

- Telling builders and plumbers what to install
- How the Rainwater Harvesting system operates and how to manage it
- How to tell if there is a problem and what to do
- Key Points about Rainwater Harvesting
- 6 page bibliography

Questions?



- Happy to take questions now or at the end of the sessions
- Thanks