



CRC for
Water Sensitive Cities

Waterproofing the West

Location:
West Adelaide,
SA



Case Study — Prepared by Cooperative Research
Centre for Water Sensitive Cities, September 2018



Australian Government
Department of Industry,
Innovation and Science

Business
Cooperative Research
Centres Programme

Insight

Stormwater harvesting, treatment and subsequent storage within an aquifer and distribution to western Adelaide for recycled water (non-potable) reuse

Project description

Region-wide system that harvests, treats and stores stormwater and distributes harvested water through western Adelaide, sustaining a growing economy and enhancing the natural environment. The project will result in sound water management and will treat and inject up to

2,400ML of stormwater each year. The recycled water is now used for irrigation and for flushing toilets, watering gardens, washing cars and paving, and filling ornamental ponds and water features.



Pond within development
provided with treated stormwater

What does this case study demonstrate?

Each case study has been selected to demonstrate specific solutions, benefits or enabling structures that support the creation of water sensitive cities. This case study focuses on:

Rainwater and stormwater harvesting

Stormwater treatment

Managed aquifer recharge

The drivers

Provision of an alternate water source to meet non-potable water demands, therefore reducing the dependence on mains water supplies

- **Diversity in supply** – Desire to supply an alternative non-potable water source for the community.
- **Reduced mains water demand** – Decrease the dependence on reservoirs and the River Murray for mains water.

The innovations

Aquifer injection and extraction of captured and treated stormwater for non-potable reuse

- **River pumping and wetland stormwater harvesting** – Stormwater is harvested from the surrounding local catchment as well as the stormwater flowing into the urban section of the River Torrens. Local stormwater is captured and treated in constructed wetlands. Diverted flows from the River Torrens supplement the local catchment flows, approximately doubling the volume of stormwater recycled.

- **Series of treatment wetlands** – Total of 11ha of treatment wetlands have been constructed, at Old Port Road, Riverside Golf Course, Cooke Reserve and St Clair. These are able to treat the stormwater to a water quality suitable for recycled use.
- **Storage in local underground aquifers** – Harvested stormwater is injected into local aquifers during winter, to be extracted for use in summer.
- **Link and distribution main** – 36km of pipework link the three wetland and aquifer storage and recharge sites, to allow recycled water recovered from aquifers to be distributed throughout the western suburbs.




The lessons

- **Recycled water is attractive to potential buyers** – Reduced cost of water for the residential lots as a result of the recycled water connections made properties within the sub-division more attractive to prospective buyers. Another attraction to prospective buyers is that properties connected to recycled water are also exempt from state water restrictions, which were in place at the start of this project.
- **Alternative water without sacrificing space on lots was popular** – One of the selling points with houses was that they didn't require rainwater tanks, which saved on space and money for home owners.



Stormwater treatment wetland

The outcomes

 Cities providing ecosystem services	 Cities as water supply catchments	 Cities comprising water sensitive communities
<ul style="list-style-type: none"> • Protected receiving environments – Reduced stormwater flows and pollutants will help prevent the degradation of seagrass meadows, as well as decrease the pollution that contaminated the Gulf St Vincent’s coastline marine environment. From 2014-2017 the total volume of potentially polluted stormwater prevented from entering the Gulf has been estimated to be 1704ML/yr. • Local biodiversity – Creation of wetlands enhances the natural environment and local biodiversity. 	<ul style="list-style-type: none"> • Alternative water sources – Using local catchment runoff and diverting River Torrens flows as an alternative water source for the 64ha development reduces the potable water consumption by 555ML/yr. • Aquifer storage and recovery (ASR) – Storage and extraction from local aquifer provides additional storage volume, maximising reuse potential for the stormwater. 	<ul style="list-style-type: none"> • Water conscious community – Recycled water in the home in a water scarce community helped bring awareness to and change perceptions around water sustainability. • Improved local amenity – Wetlands and irrigation have improved the amenity and resilience of community green spaces.

Business case

Costs	Benefits
<ul style="list-style-type: none"> • The total project budget of AU\$71.5 million was funded from the following partners: <ul style="list-style-type: none"> o City of Charles Sturt (\$19.46 million) o City of Port Adelaide Enfield (\$4.43 million) o SA State Government (\$20.07 million) o St Clair JV Developer (\$5.25 million). • Approximately 30% of the funding was available through flood mitigation funds, with the remaining 70% available through Water Reuse Funds. 	<ul style="list-style-type: none"> • Reduced cost of water bills to households through reduced use of mains water. • Reduced nutrient rich discharge flowing into marine environment. • Increased local amenity through wetlands and attractive community spaces, green parks and reserves. • Educational benefits and employment opportunities for local schools and community.

Transferability

The stormwater harvesting and wetland treatment elements of this project have widespread applicability across Australia, as do recycled pipeline measures. It is especially transferable for greenfield developments, where construction and infrastructure costs can be optimised during the sub-division design and masterplanning stages. The aquifer storage and extraction element of Waterproofing the West would be applicable in other areas where local aquifers exist, such as in regions of South Australia and Western Australia.

Project collaborators

- Australian Government
- Government of South Australia
- St Clair JV Developer
- City of Charles Sturt
- City of Port Adelaide Enfield
- Adelaide and Mount Lofty Ranges Natural Resource Management Board
- Natural Disaster Mitigation Program

Awards

- Stormwater South Australia 2011 – Excellence in Strategic or Master Planning
- CCF Earth Awards Finalist – Excellence in Civil Construction

Additional information

More information about the Waterproofing the West project can be found at:

- [Waterproofing the West Fact Sheet](#)
- [Aurecon's Unplugged Sustainability Story](#)



Stormwater treatment wetland adjoining a residential area

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