



Water sensitive urban design

Community bores

Summary

Across Perth, domestic gardens are generally watered using either potable scheme water, or unlicensed, domestic garden bores. Studies have identified that more than 40 per cent of household scheme water is used on gardens, and that water usage from garden bores can be up to four times higher than scheme water used on domestic gardens. A community bore can be an effective alternative for private garden watering and irrigation of communal green spaces.

A community bore can be a water-efficient alternative for providing water for non-drinking purposes, provided that enough groundwater is available, and that overall water use is lower than it would be with a mix of scheme and garden bore irrigation. A community bore is a bore or multiple bores that deliver groundwater to several properties for non-drinking uses. The water is delivered via a third pipe (or purple pipe) network throughout the development.

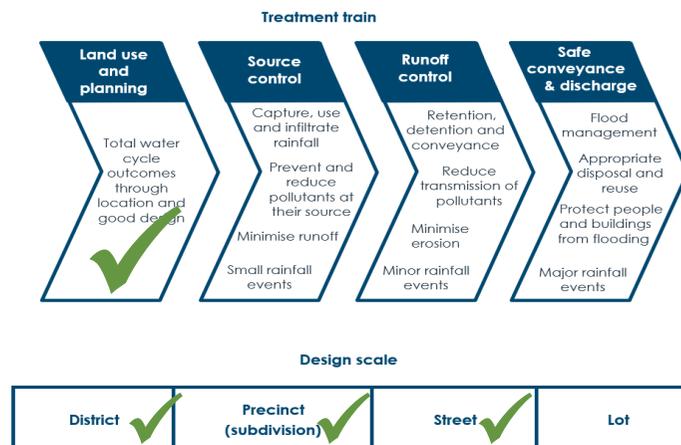
Where a sustainable source of groundwater is available, these systems help form integrated water management solutions in urban environments when implemented with water efficiency measures. However, the complexity of these systems requires careful planning, design and implementation to be effective.

Required reading

- Water Corporation, *Waterwise Council Community Bore Guide*, 2018
<https://www.watercorporation.com.au/-/media/files/business/save-water/waterwise-council/waterwisecouncilcommunityboreguidefinal2018.pdf>
 Water Corporation, *Close out and lessons learnt report Evermore Heights, Baldivis*, https://www.watercorporation.com.au/-/media/files/residential/water-supply/ongoing-works-and-projects/evermore_heights_-_third_pipe_scheme_-_close_out_report.pdf
 DWER, *Water recycling and efficiency note: Community bores*. http://www.water.wa.gov.au/_data/assets/pdf_file/0013/3514/104048.pdf

Main Benefits

- Potential to provide a well-managed, fit-for-purpose alternative non-potable water supply, which reduces scheme water and groundwater demand.
- Reduced total water use and improved monitoring of the local groundwater resource use when compared to unlicensed, un-metered domestic bores.
- Maximised water efficiency when implemented with individual metering, efficient irrigation systems and water-efficient landscape design.
- Maintained or increased urban greening, reduced urban heat and improved local amenity.
- A third pipe (purple pipe) network has the potential to distribute recycled water if local groundwater resources become unviable.



Planning

- The primary consideration for a community bore is the availability of a suitable groundwater resource. Seek confirmation of water source availability from Department of Water and Environmental Regulation (DWER). The aim of the system should be to reduce scheme water use, and to reduce demands on the local groundwater aquifer.
- Where an existing licence allocation is to be used, consider returning a portion of the allocation to DWER to assist in the ongoing sustainability of the aquifer in response to climate change. Where a transfer of licence is proposed, this may require retiring a portion of the licence allocation.
- It is important to identify a potential service provider as part of the feasibility assessment. Depending on the system that is implemented, the service provider may require a water services licence from the Economic Regulation Authority.
- Establishing a community bore requires engagement of several stakeholders, including representatives from DWER, Water Corporation, Department of Health (DoH) and the local government. This can be achieved by the project team as part of planned consultation. Where the project is significant, this may require formation of a stakeholder working group.
- Community bore viability will depend on the post development water balance i.e. seasonal water demands that consider housing typologies, public open space size and landscape design.
- Detailed cost estimates and cost benefit analyses should be undertaken to understand capital, operating and maintenance costs.
- Determine billing arrangements, including varying charges, for differing lot sizes, fixed charges or volumetric charges.
- The community bore will require approval from:
 - DWER – license to install bore and license to abstract water (under Section 5C of the *Rights in Water and Irrigation Act 1914*).
 - DoH – demonstrate measures to manage any risks to public health.
- In some instances, the developer, local government or water service provider may be required to obtain a water services licence from the Economic Regulation Authority.



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Design and implementation

- Incorporate the community bore into the site masterplan and ensure space is allocated for the community bore facilities.
- Create guidelines to ensure residents are informed of the community bore, landscape design requirements and irrigation system uses.
- Incorporate a variety of water sensitive urban design and water efficiency elements to ensure the community bore is operating as part of an integrated approach to water management.
- Determine technical requirements such as size and type of tanks, pumps and pipes, filtration systems, meters and pump housing (where required).
- Use qualified professionals to install the bore, pumps, storage tank, filters, irrigation controllers, distribution network of pipes and meters to ensure appropriate and effective installation of irrigation infrastructure. Lot irrigation systems also need to be determined. Refer to the Australian Drilling Industry Association (www.adia.com.au) and Irrigation Australia (www.irrigationaustralia.com.au) to identify qualified professionals.

Operation

- A safe and effective community bore requires commitment from a service provider to undertake regular maintenance, data analysis, reporting and adaptive management, as well as provide ongoing community support.
- Maintenance and system failure response procedures and manuals should be established, including procedures and frequency of volumetric monitoring (abstraction and consumption), water quality testing, equipment inspection and servicing (including pump servicing), and protocols for responding to equipment failure or detection of leaks. It is important that all licence conditions are met, including commitments to DWER, DoH and/or the Economic Regulation Authority.
- Residents must be informed about the community bore by the developer (including benefits, operation and costs) at lot purchase. Residents should be informed about how to sustainably use the system and procedures for responding to system failures.
- Metering procedures to be clearly communicated and understood by the operator, local government and residents to ensure use and cost data is captured.
- Handover from the developer to the service provider should include details of billing, copies of maintenance and operation manuals, copies of technical drawings and keys/passwords associated with equipment and monitoring data.

Other Community Bores

Rosehill Waters is a 47 ha development that includes a community bore to ensure that no scheme water is used for irrigation of private and public gardens.

Evermore Heights is a residential estate that implemented a community bore and third pipe system. The use of the bore was discontinued in 2016, citing failure to achieve water efficiency and cost effectiveness.

Brighton has over 900 properties connected to the community bore through a third pipe system. Water Corporation has owned and operated the system since 2015.



White Gum Valley Community Bore

Landcorp's White Gum Valley development (2.2 ha) aimed to reduce scheme water use and included the installation of a community bore for irrigation of public and private green spaces. The community bore supplies 5,000 kL/yr via a purple pipe to the irrigation system, including 3,000 kL/yr to individual properties.

Key stakeholders for the project included Landcorp, City of Fremantle (operators), JBA, Tabec, Water Corporation and DWER. The drivers for success were identified as having a clear and meaningful message around the reason for the bore, and leadership and willingness to trial innovative ideas from Landcorp and the City. During this project, JBA noted that barriers to success included the cost of the additional third pipe infrastructure and lack of perceived incentives and assurance for the developer.