



The Premier's Water Foundation was created in response to the State Water Strategy released in February 2003 by the Western Australian Government. The Foundation's programs will support research and development projects that challenge boundaries and investigate innovative new ways of conserving water and maximising reuse of wastewater.

# Project # 034/04G Demonstration of Decentralised Wastewater Recycling in Urban Villages

## A Premier's Water Foundation Project

The Project: Complete a waste water recycling trial by June 2009 at 3 sites within the Metropolitan and Peel Regions to demonstrate and evaluate the performance, reliability, attributes and feasibility of decentralised wastewater recycling.

This exciting project will comprise a wastewater recycling trial with a high degree of monitoring to demonstrate the performance and reliability of decentralised wastewater systems. The project will study the effects of using wastewater on local soils and plants as well as testing for pathogen disinfection and nutrient levels in groundwater. The project will also measure the amount of bore and scheme water saved by using wastewater in urban villages.

The research will occur in collaboration with National Lifestyle Villages Pty Ltd, Peel Waters Pty Ltd, Mallee Nominees Pty Ltd and other developers with support from Department of Health (DoH), Department of Environment (DoE), local government and Water Corporation. The project is focussed on the Perth metropolitan area and Peel Region over the period 2005-09.

### Project Sites

#### Year 1 (2006) – Household-scale greywater recycling;

During the first year the project will install a "Greyflow" greywater reuse system on each of 380 homes in the Bridgewater Lifestyle Village (National Lifestyle Villages Pty Ltd) in Erskine, Mandurah. Some houses will also be fitted with a constructed wetland to control nutrients. Researchers are now monitoring these systems at the site.

#### Year 2 (2007) – Village-scale greywater recycling;

At the Timbers Edge Village (Peel Waters Pty Ltd) in Dawesville, Mandurah 260 houses will discharge their greywater into a large constructed wetland that in turn will provide treated water for irrigation of public open space around the village. As well as the technical aspects of re-using greywater the project will also address developer concerns over strata management and sub-contractor maintenance of such systems. Monitoring has also commenced at this site.

#### Year 3 (2008) – Village-scale wastewater recycling.

Although the site is yet to be determined this part of the project is the most ambitious. All wastewater from 50-500 homes will be passed to a village scale wastewater treatment plant and then the treated wastewater will be used throughout the village for POS irrigation. Again issues of management, operation and maintenance as well as community education will be considered.



From Top left: Team Leader Dr Martin Anda, Beth Strang, Kat Taylor, John Hunt, Nora Oyama growing plants with treated wastewater and Shaun Jameison with a Biomax Unit

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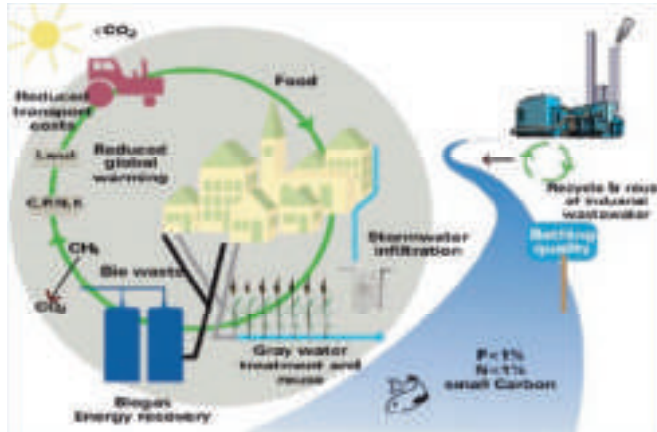


Environmental Technology Centre

Murdoch University  
South Street, Murdoch,  
WA, 6150, AUSTRALIA  
phone: +61 8 9360 7310  
e-mail: etc@murdoch.edu.au  
web: www.etc.murdoch.edu.au

## The Closed Loop Approach

Recycling of water and nutrients with decentralised wastewater treatment systems in urban villages. (taken from UNEP 2002)



### Urban Water Management Projects at the ETC

New code of practice for urban village effluent recycling schemes (Hons – Beth Strang, scholarship by National Lifestyle Villages P/L);

Appropriate technologies for wastewater recycling in urban villages (Hons – Shaun Jamieson, scholarship by National Lifestyle Villages P/L);

Measuring the Water Efficiency of Urban Developments (Hons – John Hunt, scholarship by National Lifestyle Villages P/L);

Monitoring of Nutrients from Greywater Irrigation in Soil (Hons – Jay Dhillon, scholarship by Peel Waters);

Sustainable Urban Landscape with Greywater (PhD – Joshua Byrne, scholarship by Multiplex);

Operation and Maintenance of WWTP and Community Involvement (PhD – Beth Strang, scholarship by Murdoch Univ and PWF);

Integrated urban water modelling (PhD - John Hunt, scholarship by Murdoch Univ and PWF).

### What is potable water?

Potable water is drinking water; water that is either clean enough to drink with no ill-effects or water that has been treated to drinking-quality standards. Can you think of uses, around your home, where you do not need to use drinking-quality water?

### What is wastewater?

Wastewater is all the water that you flush or drain away from your house once it has been used for something (like washing your clothes, bathing, flushing the toilet and so forth). Wastewater from the toilet is called 'black water' while all the other wastewater is called 'grey water'. Many golf courses and playing fields in country WA use treated wastewater for irrigation. The Water Corporation has recently prepared guidelines for land developers on use of non-drinking water in urban developments.

### Can we re-use wastewater in a local setting?

Yes. We can all safely use grey water to water the garden. There are now a number of systems available that are approved by the WA Department of Health. In many parts of the world there are well established wastewater reuse schemes in urban developments. There is now great interest by land developers and government in WA to reuse wastewater as well as greywater in Perth urban developments as a means of conserving drinking water and groundwater.

### What is a centralised wastewater management system?

A big city may have one (sometimes several) treatment plants to take all the city's wastewater, treat it and then dispose of it. Large networks of sewer pipes transport the wastewater across the city to a central treatment plant. Once treated it can be disposed of in rivers or the ocean. Most cities have centralised wastewater treatment systems. They are slow to respond to changes in either demand or technological improvement or innovation. Perth discharges about 350 million litres of treated wastewater from 400,000 homes into the ocean each day from 3 main plants.

### What is a decentralised wastewater management system?

Rather than having a city-wide treatment plant and a huge network of pipes it is possible to use smaller local treatment plants and alternative technologies to treat wastewater locally and then reuse it locally. Using a local treatment system to service a small urban village or a single suburb allows local reuse of water and nutrients for gardens and irrigation of parklands



For more information visit our website or:  
Contact Project Team Leader Dr Martin Anda  
Email [M.Anda@murdoch.edu.au](mailto:M.Anda@murdoch.edu.au)  
Telephone 08 9360 6123

Environmental  
Technology  
Centre

Murdoch University  
South Street, Murdoch,  
WA, 6150, AUSTRALIA  
phone: +61 8 9360 7310  
e-mail: [etc@murdoch.edu.au](mailto:etc@murdoch.edu.au)  
web: [www.etc.murdoch.edu.au](http://www.etc.murdoch.edu.au)