

# Groundwater Replenishment Trial

## 2012 Groundwater Report Summary

### Background

Groundwater replenishment is the process whereby treated wastewater is further treated to drinking water standards and recharged to groundwater supplies. The water recharged is referred to as recycled water.

In 2009, the Water Corporation began a three year Groundwater Replenishment Trial (GWRT). Following a twelve month background assessment on the Leederville aquifer, approval was given by the Trial Regulators (the Departments of Health, Water and Environment and Conservation), to begin recharge on 10 November 2010.

When the Trial is complete in December 2012, along with our Regulators, the Water Corporation will assess whether groundwater replenishment is a sustainable water source for Western Australia.

### Trial Objectives

One of the three objectives of the Trial is to assess the technical feasibility of groundwater replenishment. Part of this technical feasibility includes understanding how the Leederville aquifer responds when recharged with recycled water.

### Monitoring and assessment

There are 22 monitoring bores located at the Trial site in Craigie. Along with a range of associated research, such as laboratory based testing, this monitoring data provides detailed information for assessment by the Trial's groundwater Technical Reference Group (TRG).

The TRG consists of groundwater experts from CSIRO, Curtin University, Department of Water, Rockwater Hydrogeological Consultants and the Water Corporation.

In collaboration with the TRG, the Water Corporation has reported the Trial's groundwater findings via two reports:

- 2011 Groundwater Report: November 2010 – May 2011; and
- 2012 Groundwater Report: November 2010 – February 2012.

There were an additional three background groundwater reports written prior to the Trial's commencement making this latest report the fifth in a series.

In line with the reporting period, at the end of February 2012, over 38,000 water quality samples had been taken since Trial commencement, all meeting stringent health and environmental guidelines. (As of early October 2012, over 53,000 water quality samples had been taken since Trial commencement, which similarly all met stringent health and environmental guidelines.)

Below is a snapshot of the findings from the latest groundwater report – *2012 Groundwater Report: November 2010 – February 2012*.

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### How much recycled water was recharged?

A total of 1,270 million litres (ML) of recycled water was recharged to the confined Leederville aquifer by the end of February 2012, at an average rate of 2.83ML per day. (As of early October 2012, 2,177ML of recycled water had been recharged to the confined Leederville aquifer.)

### What are we looking for?

The TRG require detailed information including:

- Does the water quality continue to meet the stringent health and environmental guidelines once mixed with groundwater?
- How fast and far does the water move?
- How does the pressure in the aquifer change in response to recharge?
- Does the recycled water move upwards to the superficial aquifer?

### What has groundwater monitoring shown us so far?

- The addition of recycled water to groundwater has lowered the high level of some naturally occurring chemicals, resulting in improved groundwater quality;
- Movement of the recycled water through the Leederville aquifer is variable, with water in different layers moving at different speeds;
- Recycled water was detected 180 metres west from the recharge bore in all depths of the monitoring layers but only in the deepest layer at 240 metres north (view the latest [recharge movement map](#)); and
- Recharge increases groundwater pressure in the Leederville aquifer, reducing the downward flow of water from the superficial aquifer. However, the pressure is not sufficient enough to allow upward movement of the recycled water into the superficial aquifer.

In summary, the report demonstrates recharge of highly treated recycled water into the confined Leederville aquifer does not pose any risk to the environment nor to public health.

Additionally, initial groundwater modelling carried out before Trial commencement is in line with the most recent findings. This provides confidence that groundwater modelling is accurate and can positively assist the Water Corporation in understanding groundwater systems, enabling planning for future groundwater replenishment schemes in Western Australia.

The next Groundwater Report will be available in mid-2013.