Government of South Australia

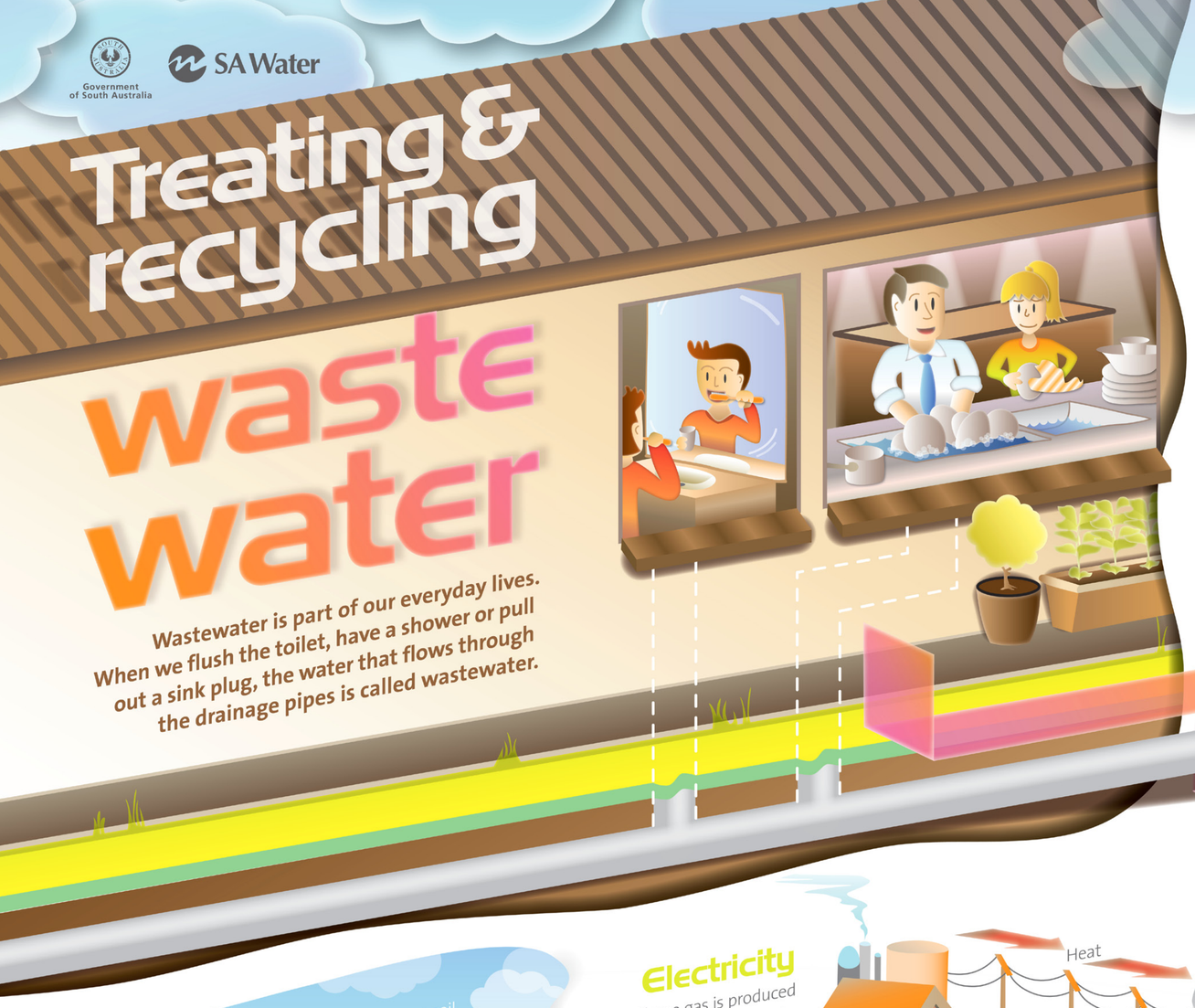
SA Water

SA Water learning centre

www.sawater.com.au

Treating & recycling waste water

Wastewater is part of our everyday lives. When we flush the toilet, have a shower or pull out a sink plug, the water that flows through the drainage pipes is called wastewater.



Treating wastewater

Wastewater contains some potentially harmful microbes that can make humans sick and damage the environment. At SA Water's treatment plants the wastewater is passed through a number of processes to clean it before it is discharged into the environment or recycled for other uses.

1 Screening out solids

Screens remove large objects like rags, plastic, and paper.

2 Removing grit

Wastewater enters the first settling tanks and is mixed by aeration (air bubbles are injected into the liquid). The grit then settles to the bottom and is collected and carted to licensed landfills.

3 Getting out the sludge

In the second settling tanks any small solid organic material left in the wastewater falls to the bottom of the tank. These solids are known as raw sludge. This waste is collected for further treatment in digestion tanks.

95% Liquid

5% Sludge

4 Digesting sludge

Raw sludge is pumped into large anaerobic tanks (no oxygen) called digesters, where it is heated and mixed, to speed up the natural breakdown of the organic matter.

Electricity

Methane gas is produced and is used to generate electricity for the plant and waste heat is used to heat up the digesters. Greenhouse gas emissions are reduced.

Heat

Methane

Biosolids

Afterwards it is dried in a lagoon or spun dry in a centrifuge. The digested sludge is now like compost and is called biosolids. Biosolids are air dried and stock-piled on site for several years.

Biosolids are used by farmers to improve soil for growing crops such as wheat and barley.

5 Aeration tanks

Wastewater from the settling tanks is mixed with active biomass which contains a variety of microbes, but mainly bacteria. The active microbes feed on the organic pollutants and nutrients in the wastewater in a similar way that people eat food and breathe oxygen.

Adding O_2

Air is passed through the mixture to provide the microbes with oxygen (O_2). The biomass grows by converting the pollutants to new organisms.

Wasted biomass to digesters

Biomass returned to Aeration Tanks

6 Separating biomass from water

The mixture of biomass and wastewater passes into the last of the settling tanks where the biomass settles to the bottom. Most of the active biomass is pumped back to the aeration tank to continue the treatment process. The remainder is pumped to the digesters.

Biomass

Clarified wastewater is discharged to the lagoons

7 Filtration

Some water undergoes further treatment by filtering through beds of sand to remove fine particles and then chlorinated to kill any remaining harmful microbes.

Recycled water

Recycled water for reuse always flows through lilac pipes

Clear water

Increasing amounts of clear water from these lagoons is being recycled. The remainder is discharged into Gulf St Vincent.

Pump

To the ocean

Lagoons

At the Bolivar treatment plant treated wastewater flows through lagoons. Natural sunlight over time helps to further disinfect the water.

2009 July. Printed with vegetable inks on Australian made, carbon neutral accredited paper (consisting of 50% recycled material and 50% sustainably forested pulp).

Recycled water from the **Christies Beach Wastewater Treatment Plant** is used to:
→ Irrigate vines at Willunga and Aldinga south of Adelaide

Recycled water from the **Glenelg Wastewater Treatment Plant** is used to:
→ Irrigate some local sports and recreation grounds. This is being extended to include the Adelaide Park Lands.
→ Flush toilets and water gardens at the Adelaide Airport.

Recycled Water

Recycled water for reuse always flows through lilac pipes

This page highlights the major uses of recycled water from Christies Beach, Glenelg and Bolivar.

Saving water and the environment

Saving water means making better use of the water we have. This includes water that has been used and enters a wastewater treatment plant.

Recycling means less demand on our fresh water supplies such as the Mount Lofty Ranges reservoirs, ground water and the River Murray.

Recycling means less treated wastewater flows into our seas and other waterways. Recycling means a sustainable water supply for crops, parklands and some housing developments. SA Water continues to be a leader in wastewater treatment and reuse.

Recycled water from the **Bolivar Wastewater Treatment Plant** is used to:
→ Irrigate a woodlot to grow food for animals at the Adelaide Zoo
→ Irrigate market gardens at Virginia
→ Flush toilets and water gardens at Mawson Lakes housing development