

# A GUIDE TO THE WATER RECYCLING PROCESS

love every drop  
anglianwater

Anglian Water works 24 hours a day, every day, to safeguard your family's health and to protect and improve the environment. Part of the way we do this is to collect wastewater, treat it and then safely return it to our rivers and seas.

Our wastewater service starts from the time:

- you flush the toilet
- you pull the plug on your bath or sink
- water falls from the sky.

## 1 SCREENING

The incoming wastewater passes through a series of screens to remove any rags, paper, wood or rubbish that might otherwise clog up the system. The screenings are removed using automatic rakes and disposed of to landfill sites.

## 3 PRIMARY SETTLEMENT

The next stage of treatment removes 50-70 per cent of the solids in the wastewater.

The wastewater flows into large tanks and is held there for two to six hours. The heavier solid material that is suspended in the liquid gradually settles to the bottom of the tanks. This is removed as a valuable byproduct called sludge.

## 4 BIOLOGICAL TREATMENT

There are two types of secondary treatment used by Anglian Water - traditional biological filtration or a more modern method of activated sludge treatment

### Activated sludge

The incoming wastewater is added to tanks containing cultures of specialist bacteria (the same as is found in natural river systems). These micro-organisms multiply, feed on and break down the organic matter in the sewage. Air is added to help speed up the process by providing oxygen for the bacteria. It takes about eight hours to break down the organic material left over from the primary sedimentation.

## 5 FINAL SETTLEMENT

The water then passes to the final settlement tanks where the activated sludge is settled out. Some of the activated sludge is then pumped to the beginning of the aeration treatment stage and used to 're-seed' the process.

## 2 GRIT REMOVAL

A large amount of grit gets into wastewater, mainly from roads and other hard surfaces. Unless removed it can cause blockages and excessive wear to pumps and machinery. By letting the wastewater flow slowly through a grit channel or Detroit the grit will settle while the lighter organic material will carry on.

## 7 SLUDGE TREATMENT

Sludge from the secondary treatment stage can be dealt with in several ways; the first step is the same in each case and that is to remove as much unwanted water as possible (dewatering).

**Dewatering/thickening** - Water is taken out of the sludge either by drying it in the open air or by using mechanical methods such as centrifuges (spinning it), belt, or filter presses. Anglian Water then treats sludge by either digestion or by adding lime.

**Digestion** - Sludge is heated in closed tanks for roughly two weeks. Bacteria reduce the volume of sludge by

converting the organic matter into methane gas. This can be used as fuel for heating digestion tanks or for electricity generation.

**Lime treatment** - Lime is added to the sludge, which causes its temperature to rise and kill off any pathogens remaining after the treatment process. This process is quicker, but results in a more odorous product.

The resultant product from the sludge treatment process is known as Biosolids and is used on agricultural land by farmers as a valuable soil conditioner.

### Biological filtration

Wastewater is sprinkled over a filter bed made up of granular material that bacteria live on. As the wastewater percolates down, the microscopic organisms attack and break down the impurities.

## 6 OUTFALL

The wastewater may need further treatment if the river or stream has little natural flow or if the watercourse is deemed 'sensitive' by the Environment Agency. This can be achieved using lagoons, filtering the water through sand or using ultraviolet treatment to disinfect it. The cleaned water is then discharged directly into the watercourse.

Returns to the water cycle