

Penrith Water Recycling Plant

Penrith Water Recycling Plant is one of 30 wastewater treatment and water recycling plants in greater Sydney. It treats wastewater to tertiary standard.

The plant has a 63 km² wastewater catchment, including Glenmore Park, Regentville, Jamisontown, South Penrith, Kingswood Park, Leonay, Cranebrook, Castlereagh, Emu Plains, Emu Heights, Mount Riverview and the lower Blue Mountains.

Primary treatment

Step screens

Wastewater is passed through step screens to remove items such as paper, cotton tips and plastic.

Vortex grit chamber

Grit is removed by a forced vortex grit chamber which causes grit and organics to spiral to the

About 95,000
people live in the
catchment

centre of the tank where they are removed. The wastewater flows through a flow splitter which splits the flow into two streams.

Sedimentation tanks

In one stream the wastewater flows to the primary sedimentation tank where solids settle to the bottom of the tank and oils and grease float to the top. The solids, oil and grease are removed by scrapers at the top and bottom of the tank.

The second stream of wastewater flows into the Intermittently Decanted Aerated Lagoons (IDAL).

Secondary treatment

The wastewater flows to either the bioreactor or the IDAL for biological treatment.

Bioreactor and clarifier

The bioreactor creates different environments in a number of tanks for microorganisms to treat pollutants such as nutrients and organic matter in the wastewater. The wastewater is then decanted in a clarifier.

IDAL

In the IDAL, wastewater goes through three stages – aeration, settling and decanting – in the one tank.

Tertiary treatment

Mixing chamber

In the mixing chamber, wastewater from the two streams combines again. Chemicals are added to make the smallest particles stick together (a process called coagulation).

Filters

The wastewater is then passed through filters made of sand. The filters trap the small particles and clear water flows through.

Disinfection

The treated wastewater is disinfected using chlorine and de-chlorinated with

sodium bisulphite before being discharged to Boundary Creek or sent to St Marys Advanced Water Recycling Plant.

Solids handling

Solids removed from the process are thickened in a dissolved air flotation tank. The thickened solids are fed into aerobic digesters where aerators stabilise the solids and reduce odours. High speed centrifuges remove excess moisture.

The treated biosolids are now ready for beneficial re-use in agriculture, forestry, land rehabilitation and landscaping.

