

key environmental outcomes

The KWRP scheme provides a number of environmental outcomes for the Kwinana environment. Scheme water use by industry is reduced and a decreased volume of treated wastewater is going to the ocean. Also, the KWRP scheme allows customers to dispose of their treated effluent to the ocean through the Water Corporation's Sepia Depression Ocean Outlet Landline (SDOOL). Previously these Kwinana industries have disposed of their effluent via short ocean outfalls to Cockburn Sound. Cockburn Sound has a limited capacity to assimilate nutrients and other wastes due to the poor flushing of the Sound. The SDOOL is a well-engineered ocean outfall some 4km offshore and in water 20m deep.

Detailed studies over the past 25 years and ongoing research indicates that the Sepia Depression has a greater capacity than Cockburn Sound to receive treated wastewater without adversely impacting the marine environment.



monitoring perth's ocean outlets

Given the sensitivity of the marine environment, the Water Corporation runs a comprehensive scientific monitoring program to confirm that the treated wastewater disposed to the ocean has no harmful effects. Independent environmental consultants have carried this out since the outlets were constructed and the results are reported to the Department of Environment. In 1996, the monitoring became known as Perth's Long-term Ocean Outfall Monitoring (PLOOM) program and more than \$3 million has been spent on it since that time. PLOOM is based on an understanding of the processes occurring during the discharge of treated wastewater and knowledge of the potential effects of treated wastewater on the marine environment.

The main elements the program monitors at all outlets are:

- Contaminants (heavy metals and pesticides).
- Nutrients.
- Pathogens.

No harmful effects have been detected on the receiving marine environment or beaches as a result of treated wastewater discharge off the coast of Perth.

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Kwinana water reclamation plant



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Commissioned in late 2004, the Kwinana Water Reclamation Plant (KWRP) supplies highly treated wastewater to industries within the Kwinana industrial precinct for use as process water and in cooling systems. KWRP is one of the largest water recycling facilities in Australia and is owned, operated and maintained by the Water Corporation and its Alliance partners.

background

Demand for drinking water can be greatly reduced by replacing it with recycled water. Water is considered recycled when wastewater or drainage water is appropriately treated and then supplied for suitable uses such as watering of parks and gardens, golf courses and non-drinking water uses by industry and households.

KWRP is owned and operated by the Water Corporation and is located on land leased from BP's Kwinana Refinery Site. The site was chosen due to its strategic location, being close to both the Sepia Depression Ocean Outlet Landline (SDOOL), which supplies the raw feedwater to the plant, and its proximity to the Kwinana industries that represent the current and future customer base.

customers

KWRP treats approximately 24 megalitres a day of advanced secondary treated wastewater from the Woodman Point Wastewater Treatment Plant (WWTP) to provide 16.7 megalitres a day of high quality process water to the Kwinana industrial area. This replaces about 6 gigalitres a year of scheme water demand.

Currently KWRP supplies product water to the Hls melt Pig Iron Plant, the CSBP fertiliser plant, the Tiwest titanium oxide manufacturing plant, BP refinery and the Perth Power Partnership. KWRP product water is used as process and cooling water by these industries.

plant performance

KWRP has been in operation since late 2004, and at full capacity since the beginning of 2008.

The product water supplied by KWRP is maintained within specification, and without major quality fluctuations. Should the Water Corporation be unable to meet customer demand due to process or equipment failure, all KWRP customers have scheme water available as a backup supply.

awards and grants

The Water Corporation received an AWA Environment Award in 2005 in recognition of the environmental benefits provided through KWRP.

the process

Raw feedwater for KWRP comes from the Woodman Point WWTP, which services most of the metropolitan area south of Perth. Treated wastewater from Woodman Point WWTP is disposed of via SDOOL approximately 4km offshore in the Sepia Depression. The KWRP take-off pipeline is located approximately half-way along the SDOOL.

Preliminary treatment at KWRP is provided through basket strainers that remove coarse solids from the raw feedwater. Low doses of chemicals are added to adjust the pH and condition the water prior to filtration.

Submerged microfiltration is used to remove fine suspended solids from the feedwater prior to the reverse osmosis (RO) process. Microfiltration also removes all bacteria and larger viruses.

The RO process is the heart of the KWRP plant. RO is used to remove dissolved salts to a very low level, along with any remaining pathogens in the water. The RO product water has a very low salinity, no colour, and no odour. It is suitable for feeding into many industrial processes that require a high quality feedwater, such as boilers and cooling systems.

KWRP Process Flow Diagram

