
How 40,000 Queensland homes rely on Grundfos quality to keep clean recycled water flowing

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TOPIC:

Wastewater treatment

LOCATION:

Queensland, Australia

COMPANY:

THE SITUATION

South East Queensland is one of Australia's fastest growing regions, as families flock from the city and States south of the border to more jobs, finer weather and the chance of finding newer and better housing.

Through the 1970s and 1980s, urban expansion from Redbank Plains to Goodna and from Collingwood Park to Springfield supported a population of about 40,000 householders. As the housing estates expanded, so did the infrastructure, with suburban streets obscuring literally thousands of kilometres of underground water reticulation pipes, and sewage lines flowing back to a wastewater recycling plant nearby.

The construction of the Goodna Wastewater Centre wisely anticipated strong future growth. It has a maximum capacity to handle wastewater from roughly double the existing population – about 85,000 people. Further, an upgrade in 1996 changed the way the wastewater was treated. In the early years, Goodna's facilities used a conventional activated sludge treatment approach to start the process of purifying the water. But in 1996 it was changed to embrace a more natural approach, capitalising on the microorganisms found in sewage sludge to feed on and help remove harmful micro flora.

THE GRUNDFOS SOLUTION

The fundamental principle involved in this wastewater treatment approach is to be able to return part-treated wastewater to reserves of incoming untreated sewage so that the feeding microorganisms can continue to satisfy their hunger for more – a genuine and natural recycling process. The key to the 'cycle' is high quality, very reliable pumps.

According to Ipswich Water End User Representative, Liam Clarke, the process that turns raw sewage into potable water follows several phases. The first sees the sewage screened of its larger solids and grit. It still contains biological solids, but commences a process of biological nutrient removal in which nitrogen and phosphorous elements are removed. Next, activated sludge is transferred to a biological nutrient removal process. After this, the processed fluid then is clarified in large settlement tanks. Solids settle from the clarified water, another separation follows, and the water is returned to the clarification process. Resulting effluent water is chlorinated and transferred to a 'reverse osmosis' facility to filter out remaining micro flora and chemicals, before being transferred to either industrial consumers or a major Brisbane Valley dam to recommence the water cycle once more.

Where it is intended to be potable quality, the water undergoes more chemical treatment before being reticulated to the people of Brisbane – and Redbank Plains, Goodna, Collingwood Park and Springfield – for the kitchens and bathrooms of millions of Queensland homes.

THE OUTCOME

The Grundfos outcome was to replace shaft-line-driven, split-case pumps more than 30 years old with new Grundfos submersible pumps, model S2504. The first crucial criterion for these pumps is that they could run 24 hours a day if necessary, without any risk of failure. As Liam Clarke noted: "If you lose the pumps, the whole process stops." This is because the Goodna treatment process relies on the recycling of microorganisms from a later phase back to the early incoming phase, in a continual cycle, allowing them to feed on incoming, nutrient-rich sewage. The Grundfos pump solution, therefore, is the key to the success of the process.

Grundfos Queensland representative, Graeme Croker, said that Grundfos product had a strong and well-established reputation for reliability, which had augured well when Ipswich Water was evaluating the pump tenders.

"These pumps have to work hard, and there must be confidence that they can do the job," he said.

"The pump units have been tested in accordance with ISO9906 to ensure they will perform correctly, maintaining and achieving the required 125 l/s at 24 mhd in single pump operation up to 200 l/s at 10 mhd in parallel operation, all while being controlled by

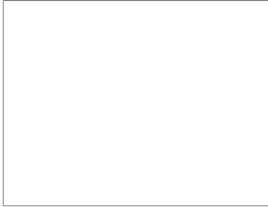
VSD. The units operate according to the incoming plant flowrate, so the operating times and total flows can vary. They operate about 20 hours per day.”

A second important aspect was that the pumps should be able to operate under water.

“The pump units are in a dry-well pit in the lower area of the plant, about three metres underground. However, there’s a chance of rain or groundwater entering it, and because the pit also contains large pipework which also has a risk of failure there’s a chance that water could flood the area, so the submersible capability of the Grundfos pumps was important,” Graeme said.

While Queenslanders from Redbank Plains, Goodna, Collingwood Park and Springfield go about their business, few understand that the success of their local water recycling plant depends on the efficiency of just two pumps, working day and night, depending on demand, to ensure that Brisbane's regional water recycling needs continue to be met.

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