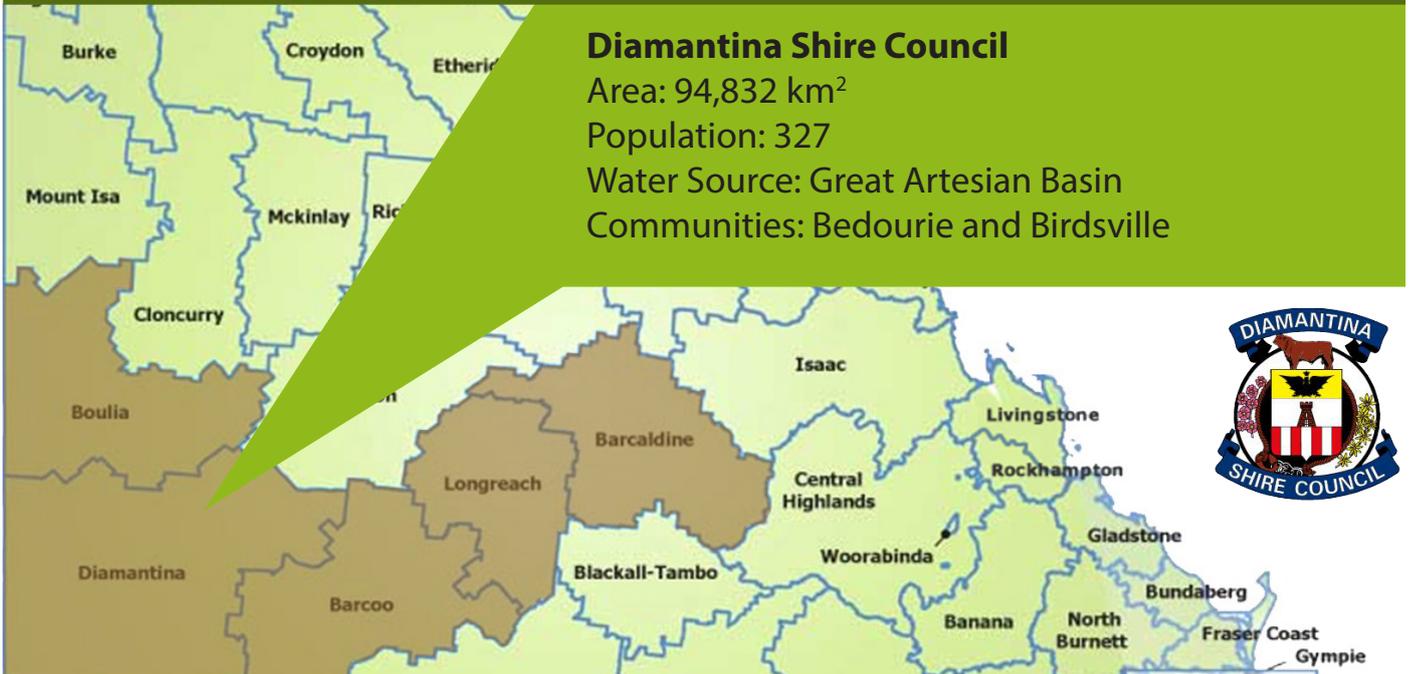


THE OUTBACK REGIONAL WATER GROUP

DIAMANTINA SHIRE COUNCIL



Water Infrastructure:

Connections: 210
Length of Mains: 21 km
Bores: 2



Sewerage Infrastructure:

Connections: 140
Length of Mains: 11 km
Pump Stations: 5

At Birdsville, the Great in the Great Artesian Basin really comes to life. Here you find the magic of water that treats itself, pumps itself and even generates electricity.

Birdsville's bore is relatively new and supplies both drinking water and provides the heat to power Ergon's geothermal power plant.

Coming out at a pressure of 1,200 kPa and a temperature of 98°C, the water is cooled to 80°C in an 80 kW geothermal power station and then by enclosed circulation through cooling ponds and heat exchangers.

Many outback towns including those in the Diamantina Shire do not have hot water systems. In a typical Brisbane household, a hot water system using electric off peak storage would account for 25% of the domestic power consumption and generate four tonnes of greenhouse gas per annum.

Raw water pumping, reticulation and sewage collection are all major users of power. In urban water supply, water supply pumping is the largest

consumer of energy (55% of the total), followed by sewage treatment (30%).

The water supply and sewage services in Diamantina Shire, like many RAPAD communities, thus generate ten times less greenhouse gas emissions with Birdsville having the additional benefit of electricity generation.



FINDING THE LEAKS

In the past, delivering water to the town of Birdsville was almost as efficient as lugging a hole-filled bucket full of water to each household – almost half the water was lost before reaching its destination!

Here the problem was not exactly ageing infrastructure; Birdsville's water mains were installed in 1961 to supply around 30 people and then upgraded in the 1970s with PVC pipes expected to last 60 years. The pipes were fine – the joints were the problem. The heat of the water coming from the Great Artesian Basin caused the O-rings at each pipe to deteriorate and leak, resulting in an estimated 40-60 ML loss per year - enough water to fill 28 Olympic swimming pools each year.

With insufficient funds to fix the entire system at once, Council focused its efforts on areas of the 'old' town which was also closest to the damaging hot water from the bore.

Services were cut in gradually with temporary dual reticulation until the new mains were fully operational.

Special emphasis was placed on using high quality components and materials that would be long-lived and resistant to high temperatures, and to the use of low maintenance equipment suitable for remote locations.

The outcome of the 2.4 km water mains refurbishment project was a huge success, both environmentally and financially. The drastic reduction in the amount of water being extracted from the GAB reduced the power required to run pumps that cool and lift the water to the elevated reservoir before conveying it through the mains. It has also reduced the frequency of maintenance work and the associated costs.

The original forecast for savings of approximately 33ML per year was smashed with the newly installed data logger demonstrating water savings directly attributable to this project at 53 ML, or 35% of the total water use each year.

KEEPING COOL

Between 2011 and 2012, Diamantina Shire Council completed the Bedourie Cooling Ponds project to provide cooler reticulated water throughout the town. Cooler water not only improves the quality of life for all residents, but also reduces wear and tear on water infrastructure, lowers maintenance costs and reduces water wastage due to excessive running of taps.

The Bedourie town water supply is provided by the Great Artesian Basin through a free-flowing bore coming out at a temperature of approximately 45°C. With such a small population and therefore minimal income to support maintenance, the water cooling solution had to be low cost with little additional infrastructure and no high-maintenance assets such as reservoirs, pumps or heat exchangers. Diamantina Shire Council also wanted to avoid any ongoing expenses such as power costs.

With partial funding provided by the Australian Government's Water for the Future initiative through the National Water Security for Cities and Towns Program, Council decided the best solution was a cooling tube array within a cooling

pond. Sufficient bore head pressure to run the water through the cooling pond pipework and directly into town without the need for pumps resulted in a closed system pressurised by the Great Artesian Basin.

With mobilisation costs easily rising to as much as 30% on small projects in remote areas, Council avoided costly mobilisation by planning the earthworks to coincide with earthmoving equipment passing through town on other projects.

The success of the project is evident with Council winning the Institute of Public Works Engineering Australasia Queensland Excellence Award in 2013. Council attributes the success of the project to having a project manager involved from the early project conception phase through to finalisation, thus providing efficiency through continuous knowledge of the project and the background of the Region. A Steering Committee with significant local knowledge provided strategic guidance.

The project has exceeded expectations by reducing the water temperature by up to 18-20°C, which is higher than originally estimated.