



Roe Creek Borefield - Facts and Figures

Extensive, deep groundwater resources occur close to Alice Springs in sandstones of the Mereenie Formation. This Formation is part of a very large and complex groundwater system within the Amadeus sedimentary basin.

The groundwater system containing the Mereenie Formation is about 500 km east west and 100 km north south. The Mereenie sandstone outcrops at the surface, adjacent to Roe Creek. It drops down to about 6.5 km underground then rises to the surface on the northern slopes of the Waterhouse Range some 40 km to the south.

The groundwater systems of the Amadeus Basin are not part of the Great Artesian Basin nor are they connected to other large groundwater systems to the north.

Since the 1960s, more than twenty eight water supply production bores have been constructed into the Mereenie Formation in the Roe Creek area. The deepest production bore drilled to date in the Mereenie Formation at Roe Creek was 570 metres. The deepest investigation bore drilled to date in the Roe Creek Borefield was 619 metres.

Water is now drawn from four different aquifers in the Roe Creek Borefield: the Mereenie Formation, upper Pacoota Sandstone, lower Pacoota Sandstone and Upper Shannon Formation (limestone and limy sandstones).

Some 80% of the Alice Springs Town Water Supply is from the Mereenie Formation. Some beds of the Mereenie Formation can be unstable when pumped at high rates, but unusually hard rock just west of Roe Creek means that bore yields of more than 100 litres per second are possible in that area. Roe Creek Borefield is recharged from the periodic flows in Roe Creek and other creeks in the area. It has been estimated that 100 megalitres per year recharges the Mereenie Aquifer System from flows in Roe Creek in the Pine Gap – Roe Creek area

Since pumping commenced 40 years ago, over 250,000 megalitres of groundwater have been

extracted from the Mereenie Sandstone aquifer within the Roe Creek Borefield. This is about half the water in Sydney Harbour.

The water table in the Mereenie Formation at the Roe Creek borefield was around 100 metres below the surface in 1964. In the central area of the borefield near Roe Creek, the water level has dropped 45 metres due to extraction for our town water supply. Extraction at Roe Creek borefield has withdrawn water from the Mereenie Sandstone over its full width (about 500 metres at Roe Creek) and over a length of 23 kilometres from beyond a few kilometres west of Pine Gap to the east of the Santa Teresa Road (just east of the airport).

The rate of decline of the water table in the central area near Roe Creek gradually increased from 1964 to just over 2 metres per year. Since 1992/93 the rate has dropped to around 1.2 metres per year in the central area adjacent to the cluster of production bores, about 0.7 metres per year south of the airport, and 0.4 metres per year south east of the airport.

The future rate of decline below the current 145 metres (below ground level) in the central area is dependent on a wide range of factors not the least being the annual demand for the town water supply. Currently,

the Alice Springs consumption is around 580 litres per person per day compared to the national average of around 248 litres per person per day.

The prevailing assessment of the groundwater resources of the Roe Creek Borefield indicates that the water in storage below the current water table to 300 metres below ground level (which is commonly considered the limit of economic extraction) could provide the town with several hundred years of water at the present rates of extraction.

The two key issues with the Roe Creek Borefield are the economic depth of pumping and the future behaviour of the deeper aquifers.

The economic depth of pumping includes: the very high cost of deep production bores in this area; the need for deep monitoring bores; the high, increasing cost of pumping from great depths, and the technical depth limit of current pumping equipment. Deep production bores can cost upwards of several hundreds of thousands of dollars to drill and complete. Very deep large diameter production bores production bores could run into the millions.

With respect to the future behaviour of the deeper aquifers, it is a question of monitoring in the short term and possibly additional expensive groundwater investigations in the long term. Our current assessment is that there are ample groundwater resources within the Roe Creek Borefield area to provide the primary water supply for Alice Springs for the immediate future. In 2009 Power and Water Corporation conducted another groundwater investigation in the Roe Creek Borefield which

included the drilling of several new production bores.

To the east of the Roe Creek Borefield a new town water supply borefield is proposed at Rocky Hill on Undoolya Station. This is within the same aquifer system as the Roe Creek Borefield but is currently outside its area of impact. Land has been set aside for this new borefield but its development is not currently planned. This is due to the infrastructure capacity of the existing Roe Creek water supply system, the high cost of developing a new borefield and associated infrastructure, and the ample groundwater resources available in the existing borefield region.

Whilst there are very large groundwater resources potentially available from the Roe Creek Borefield there are a range of cost and management issues that the community, government and the Power and Water Corporation must take into account. These include the increasing pumping costs from the Roe Creek Borefield, and water supply demand management, including reducing the per capita demand of the Alice Springs population.

Further information

<http://www.nt.gov.au/nreta/water/ground/alicemap.html>

Jolly et al (2005) 'Volume of Groundwater Stored in the Mereenie Aquifer System, in Pine Gap / Roe Creek to Rocky Hill / Ooraminna Region' NRETAS Report 36/2005A

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