

South West Yarragadee Blackwood Groundwater Area

FactSheet

July 2003

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Investigations into groundwater in the South West - a history

The wise use and management of Western Australia's groundwater resources will ensure our water supplies and natural environment are protected and maintained into the future. Understanding our groundwater resources is an essential first requirement in establishing wise use and sound management.

Early understanding of the intrinsic value of water was central to Aboriginal culture. Groundwater resources have since been investigated throughout the State by government and private sector geologists and hydrogeologists since the early days of European settlement. Aquifers need to be understood for the nature of the geological structures, the amount of water available and its quality, the rate of aquifer recharge, the ease of abstraction (removal by pumping), and most importantly, how much can be used safely without adverse effects.

The methods used to define our groundwater resources include interpreting geological structures from surface features, and using geophysics and information from boreholes to show what is happening below the ground. Test pumping can show how groundwater responds to abstraction, and water levels in boreholes can be used to determine trends in groundwater movement.

Investigations in the South West

Early use of deep groundwater resources

Most wells and bores in the south west for every-day private use have been sunk into the shallow or superficial aquifer. Deeper aquifers have been used as public water supplies since early last century. The first production bores into the South West Yarragadee aquifer were drilled at Bunbury around 1898, and access to the aquifer in Bunbury involved getting through the hard 'Bunbury Basalt' layer. Busselton initially obtained its water from the shallower

Leederville aquifer, with later bores drilled into the Yarragadee aquifer.

Investigating the deeper aquifers – the South West Yarragadee and the Leederville

Some knowledge was gained from bores drilled by private companies for oil exploration in the 1960s – such as the Whicher Range Well.

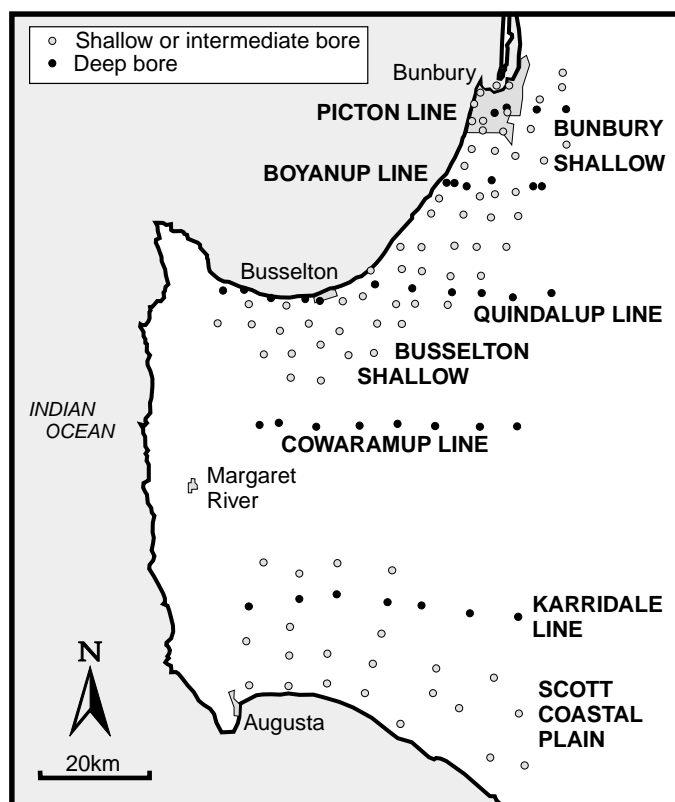
Serious investigation of the groundwater resources in the South West commenced at about the same time. Geophysical investigations provided some early insights. Regional gravity surveys in the 1950s helped define the thickness of the sedimentary rocks, which then helped define its water resource potential. Seismic and magnetic surveys were used to define the types of rocks and the thickness of different formations

Systematic drilling was commenced by the Geological Survey of Western Australia in the 1960s. The investigations involved drilling a number of bores at sites (up to three bores at each site) located in an east-west line across the south west region, or set out in a grid pattern. The east-west alignment is selected because the geological structures lie north-south – thus a line of sites is placed across the structures. This makes it easier to interpret the nature and function of the aquifers. Bores have either been drilled right through the South West Yarragadee aquifer, or they have been intermediate bores – mainly investigating the Leederville aquifer.

The first study was done on the 'Quindalup Line', over the years 1966 to 1980. All the investigations, and the project hydrogeologist leading each study are shown in the table over the page.

The map over the page shows the location of these sites, which typically have one to three boreholes of varying depth at each site. This network of sites is monitored twice annually for the depth to water, at the end of summer and at the end of winter. The measurements to date show that some groundwater levels are declining, owing to groundwater abstraction, whereas others are stable, reflecting short term trends in rainfall in some cases (see *FactSheet 10*).

Line or project	Years of investigation	Number of sites	Chief investigator
'Quindalup'	1966-1979	10	Phil Wharton
'Picton'	1974-1978	4	Phil Wharton
'Bunbury Shallow'	1975-1980	27	Phil Commander
'Boyanup'	1981	4	Robin Smith
'Busselton Shallow'	1983-1984	36	Klaus Hirschberg
'Cowaramup'	1986-1988	8	Steve Appleyard
'Karridale'	1989-90	8	Len Baddock
'Scott Coastal Plain'	1989-1992	22	Len Baddock
Total		119	



Investigation bores 1966-1992

What has been learnt?

These investigations of geological structures, groundwater depth and quality, and groundwater pressures have provided a solid understanding of the two most important deep aquifers – the South West Yarragadee and the Leederville. The findings have been presented in public reports, which are available through the Water and Rivers Commission. The information has been used to set allocation limits for water drawn from these aquifers.

What still needs to be done

The map shows a good coverage of investigation sites, except for the area in the middle of the Blackwood Plateau due east of Margaret River. This area is the focus of current investigations and a further 47 sites have been drilled to complete the network for the region, concentrating on the Blackwood Groundwater Area (see *FactSheet 6*). These additional sites will yield data on the nature and rate of recharge of the South West Yarragadee aquifer, the age of the water in the area, and the rate of flow. Other studies are investigating the role of discharge from the aquifers in sustaining wetlands and streams in the area.

Many of the investigators who did the earlier studies are involved in the current Investigation Team for the South West Yarragadee-Blackwood Groundwater Area project – which provides an important continuity in knowledge and skills for this current work.

For more information contact

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