Government of **Western Australia**
Department of **Water**

Managing the Lower Gascoyne River

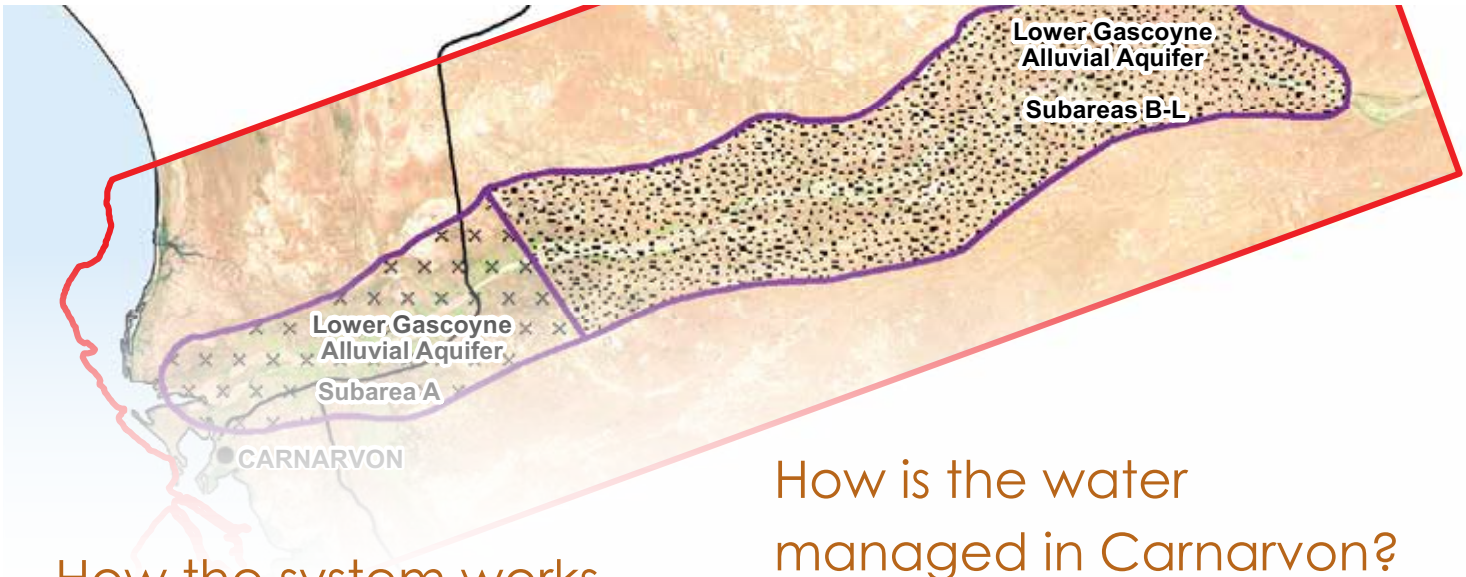
The Carnarvon horticultural industry sources water from the Lower Gascoyne River. Worth $80 million annually, the industry underpins the local economy, supplying fruit and vegetables to Western Australian and national markets.

Recognising this valuable economic role, the Government of Western Australia has, and continues to invest in Carnarvon. A key factor to creating a vibrant local economy is to ensure that a secure water supply is available to underpin production and local investment.

Where does the water come from?

Although dry for most of the year, the Gascoyne River has large amounts of water stored below ground. This water lies in deposits of sand and gravel within the river channel and provides a substantial supply for the town and the horticultural industry.

When the river flows, usually from cyclonic rainfall in the inland catchment, the groundwater is replenished. This water then remains in storage for use as needed.



How the system works

As the water supply is dependent on river flows, the size, duration and water quality of each flow event affects the amount and quality of water stored in the river sediments. River flows are generally annual, however extended periods of no-flow sometimes occur.

Water is not recharged and stored evenly across the river sediments. In some areas there are high levels of clay, allowing less water to be stored. In other areas the sediments contain layers of sand and gravel which can hold larger volumes of water.

The other main factor is salinity. The river channel is bounded by highly saline water below and on either side. This saline water can intrude into the river sediments as a result of over pumping or natural geological features, such as limestone.

This variation in storage and salinity can happen over short distances and as a result groundwater supply and quality can be very different between neighbours.

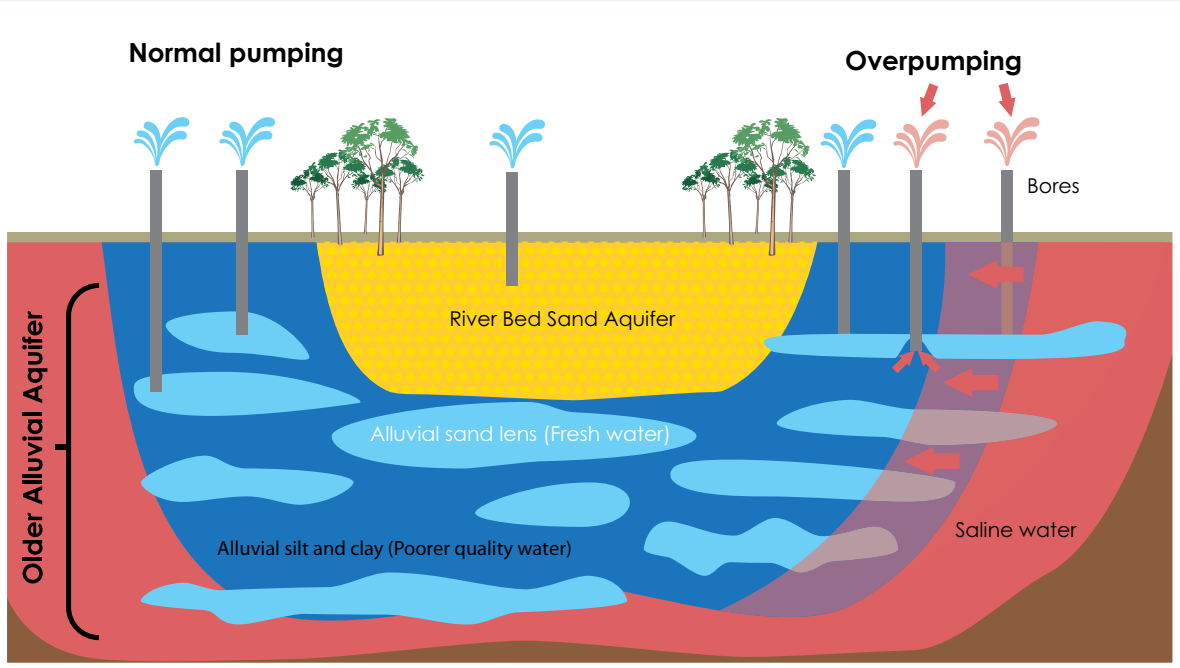
How is the water managed in Carnarvon?

The Lower Gascoyne River is divided into two management units - Subarea A, covering the area of horticultural plantations upstream from the town site; and Subareas B-L which are east of Subarea A.

Groundwater in Subarea A is used by horticultural growers who draw water from the shallow riverbed sands and alluvials using self-supply bores and sand spears. This water is pumped from the river for irrigating crops.

Subareas B-L are used only by the Water Corporation and the Gascoyne Water Cooperative. They supply bulk water from their borefields and distribute it to users in the horticultural precinct and town via a network of pipes.

Water resources in the Lower Gascoyne area are managed by the Department of Water in accordance with the *Lower Gascoyne water allocation plan*. Released in 2011, the Plan outlines how the water resource is managed to balance productive use with ensuring the long-term viability of the aquifers.



The Plan was developed in partnership with the community. It is based on a series of principles that are specified in the Subarea A groundwater licences. These include:

- A maximum monthly draw (10,000 kilolitres) to prevent saline water from being drawn in during restricted pumping months,
- A maximum salinity level (1000 parts per million) to prevent permanent damage to groundwater,
- Maximum annual volume per licence to prevent permanent damage to groundwater, and
- Unrestricted pumping during and after periods of river flow to maximise the use of water when abundant.

These practices have been shown to protect water quality and volume in Carnarvon. By using sound science and groundwater modeling, the Department of Water has proven the validity of these rules.

The management objective for Subarea A is to prevent over-pumping of localised aquifers. When a bore is over-pumped, saline water may be drawn in. Depending on the location, this could impact the quality of neighbour's water, or permanently change the local water quality.

Water allocations and usage

Irrigators have access to Subarea A, or the supply from Subarea B-L, which is distributed by Gascoyne Water Cooperative. Most irrigators have access to both of these sources.

Subarea A self-supply users are granted a groundwater licence by the Department of Water, which is their Subarea A entitlement.

To access water through the Cooperative, a grower must enter into a purchase agreement for a certain number of shares. This is their shareholding.

There is no relationship between an irrigators Subarea A entitlement and their Cooperative shareholding.

In Subarea A, the amount of water that a licensee can use is often different to the licenced entitlement. Typically the amount of water a Carnarvon irrigator can extract will be limited because bores run dry or the water becomes salty and can no longer be used. When an irrigator has high yielding bores and good quality water they are able to take their full annual entitlement.

Across the entire Subarea A the total licensee usage is lower than the total licensed volume. This is because not all irrigators can, or are fully using their entitlements.

The intent of the Lower Gascoyne water allocation plan is to optimise the amount of water available to growers through encouraging usage where good quality water is available, and reallocating water from users who have limited access to viable water.

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