

AUCTIONING GROUNDWATER (LODDON PLAINS, VIC)

KEY TERMS

Sustainable yield:

The volume of water that can be allocated to consumptive users without long term falling groundwater levels or pressures.

Permissible consumptive volume (PCV):

The PCV is an initial (generally conservative) estimate of sustainable yield by volume that the Victorian Government uses as a trigger for requiring development of a water management plan.

English auction:

An English auction starts at a low price and works up – the sale goes to the last bidder. By comparison, a Dutch auction starts at a high price and works down – the sale goes to the first bidder.

Reserve price:

A predetermined minimum price for which the seller is willing to sell a given item.

What is interesting about this case study?

This case study represents an innovative approach to dealing with community dissatisfaction about groundwater availability.

Challenges faced were:

- How to identify more water entitlements,
- How to equitably provide access to new entitlements while managing distribution of water licenses and use
- How to ensure entitlements were valued

Site overview

This case study represents an innovative approach to dealing with community dissatisfaction about groundwater availability.

The Mid-Loddon area is located in north-central Victoria (see Figure 1). For much of the area, groundwater is the only source of water for irrigation. Irrigation with groundwater in the region is dominated by lucerne and summer cropping in the central and southern areas and conjunctive use with surface water in the far north.



FIGURE 1 LOCATION OF THE MID-LODDON, VIC.

General institutional context

Goulburn-Murray Water (GMW) is rural water authority for the Mid-Loddon area, and has both groundwater and surface water licensing and surface water supply responsibilities.

In Victoria, groundwater use in an Groundwater Management Area (GMA) is capped by a declared Permissible Consumptive Volume (PCV). As commitments approach this volume, committees are appointed to develop a groundwater management plan.

PCV history of the Mid-Loddon

When PCV was approached, GMW stopped issuing groundwater entitlements until a groundwater management plan was developed. (Victorian Government, 1998a).

The community was unhappy with the limit to groundwater entitlements. Several people believed regional aquifer yield had been underestimated. Subsequently, a locally-driven review (Macumber, 1999), recommended that the PCV be increased.

To cater for this, the geographic boundaries of the Mid-Loddon Groundwater Management Area were redefined, and the PCV increased by 7000 ML.

43 applicants responded to the initial call for expressions of interest to the entitlements with total requests in excess of 30 000 ML.

An English auction process was decided on to:

- encourage development of groundwater markets in Victoria,
- support equitable access to the available entitlements,
- promote water use efficiencies, and
- encourage community participation.

A groundwater auction would also extend an earlier (surface) water auction process (Stringer 1995).

Going further

Once an entitlement limit was recognised, why wouldn't the Government just keep giving entitlements away?

Auction design

The auction concept was designed for simplicity and to maximise market competition. The Government would release new entitlements into the market on the basis a reserve price (which was not publicly disclosed) would be met.

In consultation with water customers, GMW established a framework for geographic entitlement distribution which set maximum net quotas available for development in defined zones across the Mid-Loddon area (see Table 1).

Boundaries defining the maximum volume (500ML) which could be purchased in a single lot were also set.



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A reserve price was established (see Box 1) to ensure that successful participants would be serious about pursuing an economic return on purchased entitlement.

People wishing to make a bid for water needed to register their zone with GMW prior to the date of auction. Bid conditions, designed to promote development of the new property rights, included:

- The presence of an existing or constructed bore within 18 months of the auction date,
- Fulfilment of licensing requirements and issue of licence within 2 years of the auction date,
- Planting development plan complete within 1 year of the licence issue
- 50% of the proposed planting complete within 5 years of the auction date or three years from the date the licence was issued.

Bids would be taken on the basis of a price for 1ML. The highest bidder could then nominate the zone in which they wanted to develop the water, and the size of their purchase.

Once the allowable quota for water in any particular zone was reached, no further entitlements could be purchased for development in that zone.

Going further

What other options do you think could have worked for distributing the new entitlements?

Bidding response to the auction

The auction took place on Friday, 13 December 2002. All 7000 ML was sold at the auction. There were 28 active bidders at the auction. The average price across the total 7000 ML release was A\$154/ML. Successful bids ranging from A\$120 (reserve price) to A\$420. A total revenue of A\$1 078 000 was raised, with most entitlement going to relatively undeveloped zones. Auction price trends are shown in Figure 2.

Auction dynamics and the pricing trend suggested some learning on behalf of bidders: at one point bidding failed to reach reserve – once participants understood the reserve, future bidding was tightly bound to that price.

Box 1: Setting the reserve price

The reserve price was set at \$120/ML. Considerations included:

1. the value of surface water entitlement in northern Victoria at the time (which was determined by a well established market);
2. infrastructure set up costs developing groundwater compared to surface water;
3. productivity of groundwater (moderately saline compared to surface water) on productivity;
4. greater understanding of the reliability of supply of surface water including the potential for an allocation of above 100% of surface water entitlement in most years;
5. Differing operation and maintenance costs associated with groundwater supply infrastructure compared with surface water supply;
6. The relative economies of scale of likely purchases and subsequent developments.

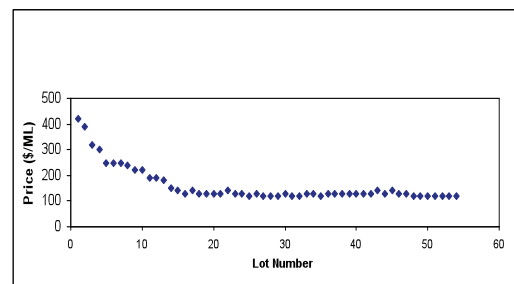


FIGURE 2 PRICE BID BY LOT FOR THE MID-LODDON GROUNDWATER AUCTION 2002 (NEWBRIDGE, VICTORIA)

Going further

Why do you think at other options do you think could have worked for distributing the new entitlements?



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Findings, outcomes and lessons

The auction provided an equitable and geographically acceptable distribution of available entitlement, and has received generally favourable community feedback.

The process contributed to new State policy in determining that auction or tender processes would be established for the future release of significant new water allocations (Victorian Government, 2004).

Price response of the groundwater auction closely follow those of the experimental simulations by Tisdell (2002; see Figure 3).

Corollary

Cossens and Rendall (2009) discuss subsequent Mid-Loddon community concerns in 2007 about declining water tables. This drove development of processes for managing extractions to reduce water level impacts. As it turned out, the water table declines were within acceptable historic range. Recharge from widespread flooding over the last two years (2010-211) has ensured sufficient water is available to meet demand.

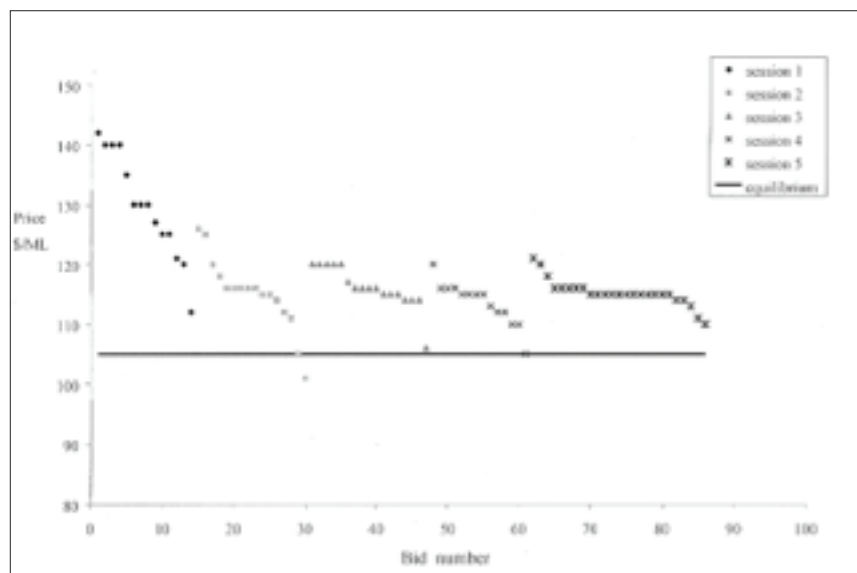


FIGURE 2 SIMULATED AUCTION PRICES (SOURCE TISELL 2002)

Consistent with Tisdell's findings, auction results show the auction system used in the Mid-Loddon generates the highest revenue, but has price disadvantages for early bidders. There was very little divergence from the reserve price (once it was identified) at the Mid-Loddon auction.

It is recommended that the relative importance of maximising revenue, equitable distribution and convergence to an equilibrium price be considered in identifying a preferred design for any future water auctions.

Going further

Evolving community concerns indicate community learning about resource management is occurring through the process of groundwater management. Both GMW and the Victorian Government have prioritized accommodating to community issues.

What do you think are the benefits of having community ownership of groundwater management?



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References and further reading

- Cossens B and Rendell R (2009). System specific local management rules for groundwater resources. Conference proceedings of **Irrigation and Drainage Conference**, 18-21 October, Swan Hill
- Holland, GF (2002). Under the hammer – Complexities in auctioning groundwater licences in northern Victoria. Conference proceedings of **Balancing the Groundwater Budget**, International Association of Hydrogeologists, Darwin 2002.
- Macumber PG (1999). Groundwater flow and resource potential in the Bridgewater and Salibury West GMAs. Dr Phillip Macumber Consulting Services. Unpublished draft report. 88pp.
- Stringer D (1995). Water markets and trading developments in Victoria. *Water*, 22(1): 11-14.
- Tisdell J (2002) English and Dutch water auction experiments. In: Catchword. Newsletter of the Cooperative Research Centre for catchment hydrology. No. 104. April 2002.
- Victorian Government, Department of Natural Resources and Environment (1998a). Permissible Annual Volume. The Bridgewater GMA. Sinclair Knight Merz. 22pp
- Victorian Government, Department of Sustainability and Environment (2004). **Securing Our Water Future Together**. State water management strategy. Melbourne.



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