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INTER-STATE WATER TRADING: *A Two Year Review*

DRAFT FINAL REPORT prepared by

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EXECUTIVE SUMMARY

Inter-state trading arrangements are improving

The pilot project has allowed 51 trades involving 9.5 GL of water to move across the Borders of South Australia, Victoria and New South Wales. Collectively, these trades are worth over $9.9 million. Three trades were worth more than $1 million. In net volume terms, more than 90% of this water has moved to South Australia.

The approach taken by those responsible for implementing the trial, as would be expected, is to learn by doing. Changes are, and have been made, along the way. **Provided that this spirit of adaptation and willingness to solve problems as they emerge continues, we see no reason to stop the trial.**

In terms of the scale of irrigation from Nyah to Murray Mouth, the total volume of water involved so far is less than 1/100th of the total water applied in the area and a relatively small part of all the trades that are occurring. Too much attention could easily be given to perfecting inter-state trading arrangements rather than the intra-state trading arrangements.

The inter-dependent nature and scale of the intra-state market is such that market signals are being sent from Shepparton to Lake Albert. Similar signals are being sent from the Murrumbidgee Irrigation Area in NSW to Lake Albert. The invisible hand of the market is encouraging water to trade into the trial area, others trade only within it. Since the mid 1990s, mostly in the last two years, over 30 GL has traded into the Sunraysia District from the rest of Victoria while less than 2.9 GL has moved into NSW and South Australia.

Intra-state trading is driving the market for water. Inter-state trading arrangements keep the various markets in place.

Administration

A surprising recommendation from brokers is that the official trial area should not be expanded until administrative arrangements are improved significantly. Illustrative of the complexity of the current system, trade documents can easily spend a total of 32 days in the post moving from one location to another.

Settlement procedures could be made consistent with best practice in dealing with property transactions. A system more like the existing land registration system would give buyers and sellers much greater confidence – the examples are right in front of us.

Current water dealing practices and procedures are much more lax than those that apply to land - even though many of the transactions are of similar value and implication.

There are significant opportunities to improve licence registration arrangements and record keeping procedures. Face to face meetings among the officers who actually manage the process could assist to this end. Many of the problems result, however, from complexities in State record keeping systems. The problems are State and Basin wide, not inter-state specific.

The South Australian legislation allows people to hold water entitlements without owning land that can be irrigated. New legislation in NSW will allow a similar mechanism to be set up in this State. **Separation of volumetric trading from access or environmental considerations simplifies administrative procedures. The question of what environmental impacts, if any, are allowed then becomes a matter for State consideration and reporting to the Commission.**

Impacts

From an economic impact perspective, and before any account is taken of environmental or social considerations our conclusion is an unequivocal one. **Inter-state trading is increasing the value of water use in the Murray-Darling Basin.** Virtually all (99%) of the water sold was not being used by sellers. During the first two years, virtually all water has gone to high value uses. Around three-quarters has gone into new irrigation development using state-of-the-art technology. The value of some of the transactions involved exceeds $0.5 million and in some cases over $1 million.

From a social impact perspective, **inter-state trading during the two year trial period has had no measurable adverse social implications for the districts that have sold water inter-state.** The water, in all but 0.4% of cases was not being used by the seller. In a significant number of cases, the revenue resulting from the sale has been used to finance installation of water-saving irrigation systems. We do acknowledge, however, that there is a slight diffuse impact as the presence of unused water makes it possible to allocate slightly more water to all other water users in the Basin.

From an environmental perspective, our findings are qualified. The environmental flow impact of inter-state water trading has probably been positive but, in all reality, the 10 GL is so small in flow terms that this gain is probably impossible to measure.

States admit that monitoring and enforcement of plans and licence conditions is a problem. **From a salinity perspective and in the long-run, inter-state trading can be expected to have a negative impact on river salinity.** Most water is being transferred to South Australian land that has not been previously irrigated with the consequence that river salinity can be expected to increase. South

Australia, however, is aware of this and is in the process of putting in place arrangements to ensure that salinity impacts remain within acceptable levels. The new salinity strategy is expected to form the backbone of this initiative. As part of this process, it will be critical that salinity prevention obligations, and their equivalent in other States, are implemented and maintained.

If adequate arrangements are put in the place, then the long-run net effect of recent trades could be neutral. For this to occur, end of valley targets will have to be set, and appropriate incentives and administrative arrangements put in place.

Experience with trades from High Impact to Low Impact areas in the Nyah to Victorian Border region suggests that market mechanisms can be used to reduce salinity. One way of simplifying environmental assessment procedures would be to establish a set of salinity exchange rates for transfers from one river reach to another.

With regard to environmental degradation at each trading destination, our conclusion depends upon the degree to which plans are enforced and the adequacy of the standards they set. All States express problems in monitoring compliance with these plans, so one can not be confident that the final outcome will be consistent with the goal set - "a procedural framework and a set of standards .... that ... does not result in increased levels of salinity, reductions in environmental flows or degradation of the natural environment."

Opportunities for improvement

Markets place pressures on all administrative systems. The pilot project provides an opportunity to see where the processes need to be revised and reworked.

Protecting water quality is a long-term goal and the fundamentals need to be put in place today while the volume of inter-state trade is low. **There is an opportunity to put in place a system that defines obligations over the long term to the environment.** The Salinity Strategy is one initiative that is defining the long-term policy goals. Another part of a long-term strategy will be a system of salinity debits and credits and a register of salinity prevention obligations and attach these conditions to the water. Where salinity impacts are not going to felt until far into the future, long-term provisions need to be made to address or mitigate these impacts.

Exchange rates are poorly understood by the buyers and sellers in the market. If market forces change in the future such that incentives exist to move water from SA to NSW, the exchange rate will act as a tax on trade. Is an exchange rate the right mechanism? If it is, it will be **important to communicate this** and provide a justification for the numbers being used.

All States need to move to improve the mechanisms for enforcement. For example, SA has been requiring Irrigation and Drainage Management Plans for some time but now these plans are being linked to the Water Allocation Plans. As Water Allocation Plans become statutory documents opportunities for enforcement increase. A related issue is the legal status and long-term enforceability of Salinity Prevention Obligations and their equivalent in other States.

To ensure long-term delivery of the trial's environmental objectives, **Salinity Prevention Obligations should be recorded on the licence. Failure to comply with the obligation should result in the sale of sufficient water to finance restitution of the obligation. In cases, where the purchaser is required to set aside money, this money should be put aside in a trust account.**

Our review, also makes it clear that there is inconsistency in the pricing and charging mechanisms in use across the Basin. In many cases, South Australia's salinity prevention obligations have a similar effect to Victoria's salinity levy but is less transparent. However, **attention needs to turn to raising fines and penalties in SA because as it stands, it is cheaper to pay the fine for exceeding one's allocation rather than buy water on the temporary market.**

Finally, the **administrative systems need to be stream-lined and harmonised** over the long term. A first step is for the water licensing officers to meet and identify the simple things that can be done to improve the processes of approving trades such as adopting common forms and guidelines where possible. During this meeting, we suggest that they explore the option of **deeming that all permanent trades take effect from the 1st July after the date of settlement. Where appropriate, a permanent interstate trade should be accompanied by temporary inter-state trade.**

PREFACE

Reviews of this nature rely on many people and considerable goodwill. First, we would like to acknowledge and thank the many buyers and sellers of water that willingly participated in the surveys and focus group discussions that we managed. Reviews of this type are also heavily dependent upon access to data held in agencies.

In particular, we would like to thank Anthony Couroupis, Tim Elstone, David Kernybone, Lindsay Leake, Dan Luscombe, Ian Murcoch, Owen Russell, Jodie Smith, Richard Thomas, Col Thomson, Joan Vandewerdt, Leigh Watmuff, and Peter Winton. All gave us their time willingly.

INTER-STATE WATER TRADING: A TWO YEAR REVIEW

BACKGROUND

Introduction

The purpose of this document is to provide the Murray-Darling Basin Commission with its first two year review of the inter-state water trading trial. The approach taken for the review involved analysis of the Commission's register of trading arrangements, examination of the associated filing systems and records, several focus group meetings and a survey of buyers, sellers and brokers.

Among States, there is considerable difference among the terms used to describe water licensing, entitlement and allocation arrangements. For the purposes of this report, we define

⇒ An **entitlement** as legal entitlement to receive a periodic, seasonal or annual allocation of a volume of water;

⇒ An **allocation** as an authorisation to extract or divert a nominated volume of water up to the volume stipulated.

⇒ A **permanent trade** as the transfer of part or all of an entitlement in an irrevocable manner

⇒ A **temporary trade** as either

a. the irrevocable transfer of all or part of an allocation to another person; or

b. the lease of an entitlement so that the lessee is entitled to use or sell any allocation attached to that entitlement.

Permanent Inter-state Trading

The first permanent inter-state trade was completed in September 1998. This trade involved the transfer of 248 ML from Wentworth in NSW to Victoria. From then until September 2000, a total of 9.8 GL has been traded among States through a process involving 51 transactions.

Under Schedule E to the Murray-Darling Basin Agreement (see Appendix 1), inter-state trading is limited to water licences located in an area stretching from Nyah to the Murray Mouth, plus that in the Darling River downstream of the Murray Weir Pool.[1] Water upstream of Nyah in Victoria and New South Wales is excluded.

Inter-state trade is not simple. It involves the transfer of water entitlement among quite different licensing systems. At the risk of over simplifying

⇒ Victoria issues High Security licences and, once all High Security Entitlement demands have been satisfied, makes additional "sales" water available in some areas. It is not possible to carry forward unused water from one year to another but a well developed temporary market for water exists.

⇒ New South Wales has a system of High and General Security licences, has a well developed temporary market and allows some licence holders to carry unused water forward from one year to the next under a continuous accounting system.

⇒ South Australia only issues the equivalent of a High Security Licence, commonly known as a "water-taking" licence but also issues "water-holding" licences that allow people to "hold" water but not use it without first transferring it to a water-taking licence.

As a result of these, and other arrangements, it is quite difficult to analyse the various markets for water both within and among States. All are further complicated by different environmental management and planning requirements, different fee and charge structures and different penalty schedules. In short, the bundle of rights associated with a one ML entitlement in each State is not identical. Consequently judgements about differences among States must be made with great care.

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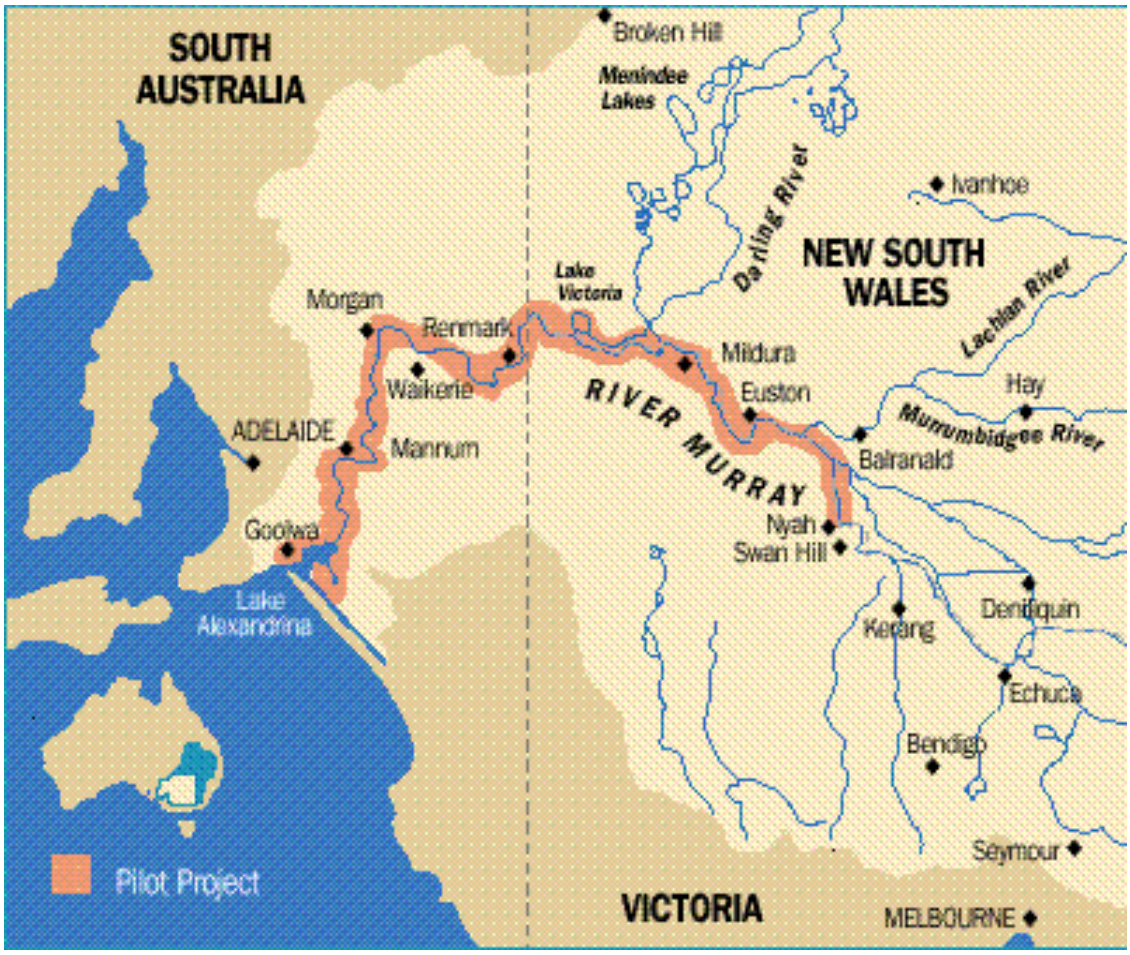
[1] Schedule E provides that a review be conducted when the volume of trades exceeds 10 GL from any State or after two years. This review was necessitated by the two year rather than the 10 GL trigger.

Figure 1 Location of the trial permanent trading area



The market for water

Many of the buyers we interviewed indicated that they bought water from the cheapest and most readily available source. To them, "water is water, and there is no difference between inter-state and intra-state water. All that matters is how much you have to pay to get it and what you have to do to get it." Markets are developing quickly and are becoming more and more sophisticated. For instance, the Central Irrigation Trust now offers 1, 2, 3, 5 and 10 year leases through their water exchange. Internet water exchanges and brokering services as well as water-ordering systems exist.

The relationship between temporary and permanent trade has a crucial impact on the outcome of water markets both inter and intra-state. The available research indicates that, at present, permanent trade accounts for only 10% of temporary trade by volume, in both the Murray Region of NSW and within the Goulburn-Murray Irrigation District in Victoria. Marsden Jacob (1999) observes that the slow uptake of permanent trade has caused major opportunities and economic benefits to be foregone or delayed.

- Permanent and temporary water markets are linked directly and indirectly by their price differential, variations in that price differential, resource constraints, State

and Commonwealth tax laws, the price of permanent water, the financial penalties for exceeding allocations, transactions costs, output prices, and water and land management practices, to name a few.

- These linkages influence the demand and supply of water for sale and for lease. For example, in much of the pilot region, producers of crops such as grapes and citrus require long-term secure access to water supplies. Vegetable, potato, rice and other annual crop producers are more comfortable sourcing water from the temporary market.

- The use of temporary water markets varies from State to State due to differences in policies and major water uses. Victoria and NSW have a tradition of fluctuating annual supplies, adopting land and water uses to accommodate those fluctuations. In contrast, **the financial penalties for exceeding the licensed water allocation in South Australia are often less than the price of temporary water. Less incentive exists to rent water in these circumstances. Indeed, the incentive is to exceed allocation rather than trade water**.

A major issue that needs more research is the range of perceptions about water markets and trading and land values. Recent interviews with buyers and sellers of permanent and temporary water in Victoria, NSW and SA indicate that up to 65% of irrigators, who choose to lease out water rather than selling it, do so because they believe that the value of their property will be disproportionately effected by the sale. While up to 65% of the buyers lease water because they can not afford to purchase it (Bjornlund and McKay, 2000b).

Another major factor causing the preference for temporary trade is policy uncertainty. South Australia and Victoria have already taken water users in their jurisdictions through a water reform process and have High Security entitlements that do not exceed the CAP set for their State. Moreover, it is generally believed that in South Australia and Victoria, environmental flow needs can be met without having to reduce high security entitlements. New South Wales, however, spent the entire trial period in a process of public consultation about water reform that has cumulated with a water resource bill that is now before the NSW Parliament. New South Wales is also exposed to complex Native Title negotiations that make it difficult, if not politically impossible, for people to expand irrigation in much of the Western Division of the State. These policy-controlled variables have resulted in considerable uncertainty that is reflected in the price of permanent water (Bjornlund and McKay, 2000b).

Drivers of the demand for water

Before analysing the nature of inter-state trading, it is necessary to understand the general nature of the key factors that are influencing the market for water. It is difficult to untangle all the exogenous factors driving demand and supply but we believe that the major influence on water moving inter-state is the fixed supply of water in SA.

Investment in the wine industry, horticulture and the dairy industry in this State is sending strong price signals and banks are insisting that these developments be underpinned by secure water rights. During the past five years, water prices in South Australia have ranged from around $500/ML in the Riverland to more than $10,000/ML in McLaren Vale. Water prices in South Australia's Riverland have more than doubled since the mid-1990s. River Murray water licenses in South Australia are trading currently in the $1,000 to $1,150/ML range.[2]

Irrigators in trial areas of NSW and Victoria have access to more upstream water than irrigators in South Australia. Across the border in NSW, high security water is trading for around $1,000/ML and in Victoria's Sunraysia district, water trades for around $730 for low salinity impact and $1,000/ML in high salinity impact areas. Further upstream, in the Goulburn-Murray Irrigation District, water trades at around $750/ML.[3] Data from NSW indicates that similar trading patterns are occurring in this State.

So why have water prices escalated over the past half-decade? And what explains the significant price differential inside and outside the pilot trading zone? The answer to the first question is straightforward -- wine. The real value of both wine-grape production and wine production has grown at more than 10% per annum over the past 12 years (Anderson 2000). Over the last 9 vintages, grape prices have increased 90% (ABS 2000). The volume of wine exports has risen from less than 5% to more than 30% of production, and will soon exceed 50%. Australia is now the world's largest wine exporter after the European Union bloc, having been a net importer of wine as recently as the early 1980s.

Since 1995, grape growers in South Australia with access to River Murray water expanded vine area by 67%, an increase of 14,217 ha. In the Riverland region alone, 7,127 ha of grape vines have been planted during this four year period (PGIBSA, 2000). Grapes, especially premium grapes, are a relatively high value, low volume water user compared with other irrigation activities. Although water is critical to grape production, water costs are a relatively small proportion of production costs. Irrigation

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[2] In SA, the supply of water is fixed and increases in demand leads to sharp increases in prices. Prices may have climbed considerably higher in South Australia without the interstate trading pilot.

[3] A survey of prices of permanent water traded out of the Murray Region and into the Lower Murray Region in NSW indicates that prices of high security water are steady at 1,000 per ML with a few transfers taking place between $900 and $950 per ML. This is based on trade taking place up until March 2000 only.

costs (including fuel for pumping costs and all related fees and levies) can range from 5 to 20 percent for grape growers, with 12 to 15 percent a likely average. Grape growers can out bid most other irrigation activities due to higher profit margins compared with other competing agricultural water uses (Marsden Jacobs, 1999).

Grapes have also expanded noticeably in NSW and Victoria. In the Sunrayisa district of NSW, grape area has expanded from some 3,800 ha to more than 6,200 ha since the mid-1990's. Across the river in Victoria, grape area increased from around 13,000 ha to 16,750 ha during this same period (ABS, 1997, 1998, 1999).

So why such significant inter-state price differentials for water? The answer is that while the grape-induced demand for water (as well as other horticultural corps) is growing in all three States, South Australia has less water available relative to demand, thus higher water prices. Irrigators in the Sunraysia district of Victoria, for example, can purchase water from the Goulburn-Murray Irrigation District. Some 30 GL have been transferred from the rest of Victoria into Sunraysia since the mid 1990's. It is our perception that the majority of these trades have occurred during the last two years. Likewise, NSW irrigators usually have access to low security water. In 1997, for example, the government lifted a moratorium on sales of sleeper water.[4]

In summary, it is our conclusion that

⇒ The real value of both winegrape and wine production has grown at more than 10% per annum over the past 12 years. The volume of wine exports has risen from less than 5% to more than 30% of production, and will soon exceed 50%. Over the last 9 vintages, grape prices have increased 90%.

⇒ Grape-induced demand for water (as well as other horticultural crops and olives) is growing in all three States and the grape varieties are changing.

⇒ The trend among grape growers is to produce high value grapes with concentrated juice which requires low yields. Keeping grape yields down means using less water. This trend implies even lower water requirements and higher returns per ML of water used. High quality grape production is encouraged by wineries through contracts with growers.

⇒ South Australia's access to water is more restricted than the other two States, driving prices up further and faster.

⇒ The price of water is the major factor explaining why water is moving from NSW and Victoria to South Australia.

⇒ Each State presents its own set of rules in terms of the ease/difficulty of obtaining development rights (zoning, land clearing, noise abatement, pesticide

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[4] Other evidence suggests that South Australia's supplies are more limited. For instance, the use of furrow irrigation declined from 50 percent of the total area in 1976 to 20 percent by the mid 1990s in South Australia. Along the Murray in the Sunraysia district 70 percent was irrigated by furrow and flood methods in the mid-1990s and in New South Wales 84 percent (Crabb, 1997).

applications rules, local taxes, etc). These rules influence the ability of each State to attract resources for development activities.

Other factors influencing stronger growth in irrigation development in South Australia relative to NSW and Victoria include:

⇒ South Australia further facilitates trades by separating water and land ownership and allowing people to hold water without a licence to use it (Legislation passed by the NSW Parliament in November 2000 will soon provide a similar opportunity in this State).

⇒ Native land title issues create more uncertainty in NSW than the other two States because much of the land in the NSW portion of the trial area is held under Western Lands lease issued for grazing purposes. In other States, virtually all land in the trial area is held under freehold title.

⇒ The process of proposing, and negotiating new water legislation in New South Wales has increased uncertainty in this State.

⇒ Victoria's Sunraysia's district charges a $129.60/ML salinity levy on all permanent transfers (with option to pay over a ten year period), raising significantly the price of water.

⇒ NSW and Victoria have access to cheaper water up stream, some 30 GL of water has moved into Sunraysia from Victoria since the mid 1990's.

Inter-state Trading - The facts

From the commencement of the trial until September 2000, applications for 53 trades have been received and all but 2 trades approved.[5] A total of 9.8 GL has been traded. Interviews with water brokers and Commission records indicates that

⇒ There has been a net trade of water into the trial area of approximately 30 GL frpm Victoria.

⇒ Significant amounts of NSW water is trading from the Murrumbidgee Irrigation Area into the trial area;

⇒ There has been a net transfer of water rights to South Australia (Figure 2);

⇒ Less than 1% of the water traded across State boundaries was being used at its origin (i.e. virtually all the water being traded permanently was sleeper water);

⇒ Trades occurred in every direction except from South Australia to Victoria (Tables 1 and 2);

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5 Two trades are on hold because the purchaser was found to be in breach of their licence conditions at the time of application.

⇒ The 51 trades involved 35 legally separate entities buying water;

⇒ At least six trades involved inter-dependent entities (effectively the one inter-dependent parties moving water from one location to another);

⇒ Brokers were involved in 100% of trades involving people at arms length from one another;

⇒ Most trades involved a broker acting for the seller and a separate broker acting for the buyer;

⇒ Victorian residents are buying water and "holding" it in South Australia where it can be held without having to attach it to a land title and without completing an environmental clearance.

Figure 2 Net volumes expected to be traded among States assuming all outstanding transactions are completed.

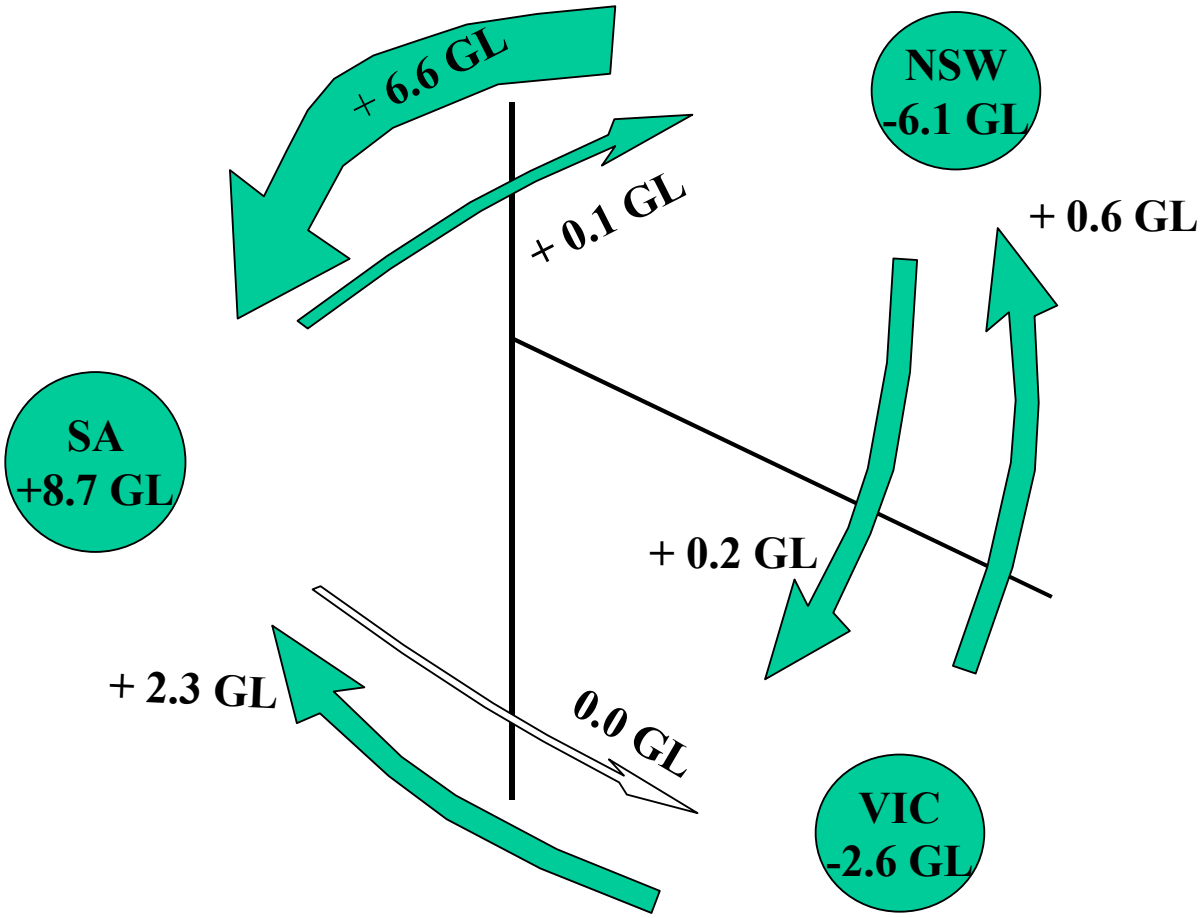

Figure 3 Cumulative volume of water traded by source and destination assuming all outstanding transactions are completed. South Australia has received 90% of all trades, New South Wales 7% and Victoria 3%

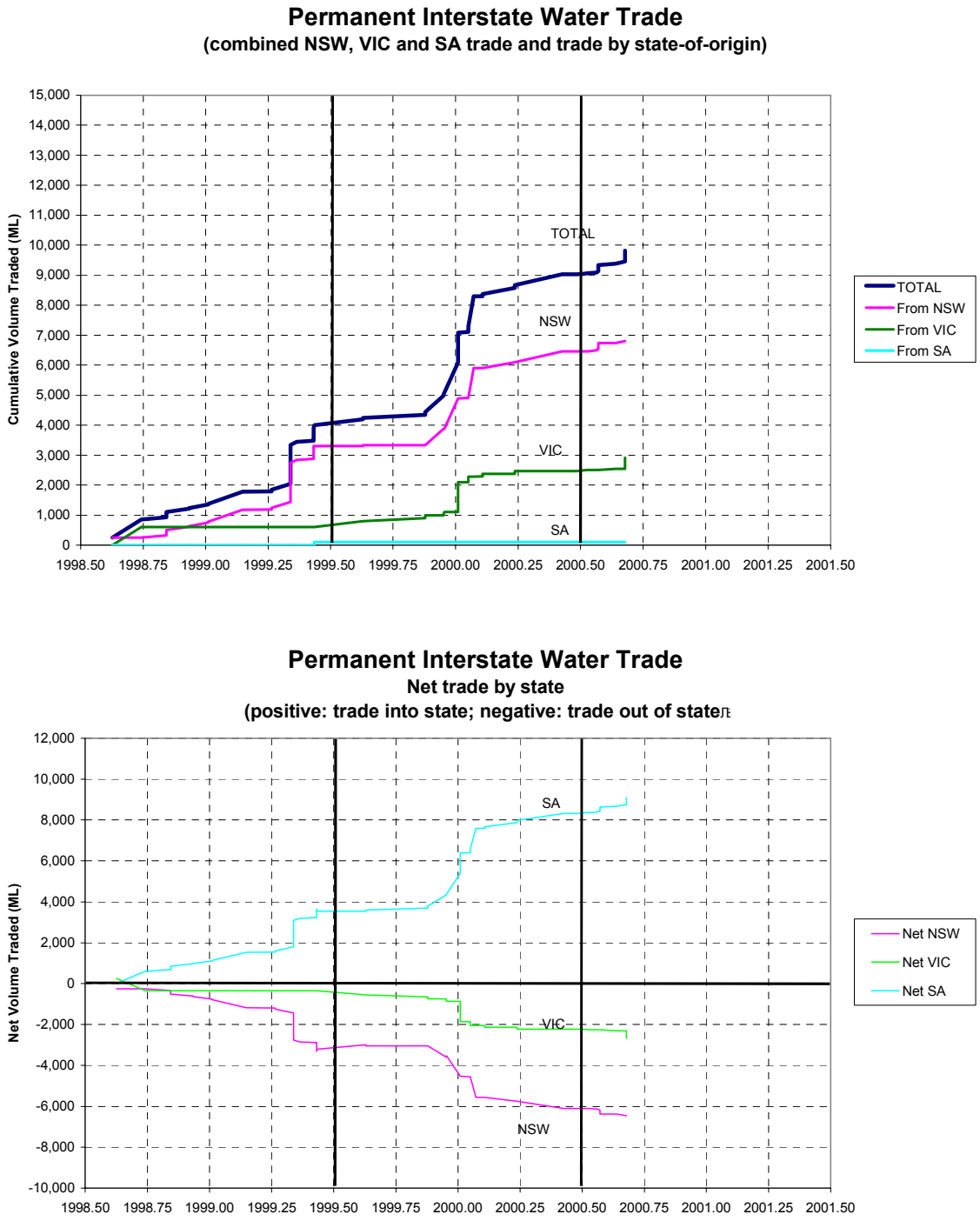

Table 1 Volume of Trades by Source and Destination (in ML)*

Origin	Destination			Total
	NSW	Victoria	SA	
NSW	-	249.0	6,556.0	6,805.0
Victoria	250.0	-	2,299.6	2,549.6
SA	100.0	-	-	100.0
Total	350.0	249.0	8,855.6	9,454.6

* Excludes two trades on hold because purchaser in breach of licence conditions.

Table2 Number of Trades by Origin and Destination*

Origin	Destination			Total
	NSW	Victoria	SA	
NSW		1	33	34
Victoria	2		14	16
SA	1	0		1
Total	3	1	47	51

* Excludes two trades on hold because purchaser in breach of licence conditions.

Economic value

A final consideration is the value of the transactions involved. Inter-state water trading involves some very large investments. During the trial period our surveys revealed that prices average from $1.00/KL to $1.10/KL. That is from $1,000 per ML to $1,150 per ML. As summarised below, 3 trades involve water purchases in excess of $1 million, 6 trades are worth more than $0.5 million (Table 3). Typically, investments of this magnitude are followed by large investments in irrigation technology, land preparation, seed stock etc.

Table 3 Value of water traded during the trial period*

Size of purchase	Number of purchases	Estimated Value
0 ML - 99 ML	24	$823,830
100 ML - 499 ML	21	$3,834,600
500 ML - 999 ML	3	$2,118,900
1,000 ML	3	$3,150,000
Total	**51**	**$9,927,330**

* Based on average price data from survey of purchasers n = 23 @ $1.05 per KL

It is also important to understand the size of inter-state trading relative to intra-state trading. As indicated below, around 1per cent of the water trading in the trial area is involved in inter-state trading.

Table 4 Permanent Trade in the Trial Area, Nyah to the SA Barrages. Trade as a percentage of the High Security Entitlements and Pumped Districts within the Pilot Zone, September 1998 to October 2000

State	ML	Trade out (ML)	Inter-State Trade as % of Allocation
NEW SOUTH WALES			
Murrumbidgee Junction to SA Border Entitlement	147,445		
Murrumbidgee Junction to SA Border Unregulated	95		
Wentworth Weir Pool	37,591		
Nyah to Murrumbidgee Junction	31,373		
Total	**216,504**	**6,805**	**3.14**
VICTORIA			
Nyah	12,113		
Sunraysia Irrigation Districts - Water Right	105,700		
Sunraysia Irrigation Districts - Sales	35		
Diverters Nyah to SA Border – Water Right	181,645		
Diverters Nyah to SA Border - Sales	7		
FMIT	73,027		
Wimmera Mallee Water	2,500		
Lower Murray Water	19,913		

Total	**394,940**	**3,261**	**0.83**
SOUTH AUSTRALIA			
Irrigation (excluding Adelaide, Country Towns and Lower Swamps)	495,000		
Total	**495,000**	**100**	**0.02**
GRAND TOTAL	**1,106,444**	**10,166**	**0.93**

Source: Joan Vandewerdt, Murray-Darling Basin Commission, pers. comm.

Bouncing water

One of our specific terms of reference was to determine if people have been "bouncing" water. Bouncing is the term given to the process of transferring water into the trial area and then trading it across the border. Before we answer this question, we observe that

- While it is the clear intention of Schedule E to limit inter-state trading to the trial area, there is nothing in Schedule E that prevents States from amending or transferring a licence either before or after a trade;

- Trading into the trial area is quite common, (nearly 30 GL of water, for example, has moved into the Sunraysia from the rest of Victoria over the past 5 years).

Bouncing is financially attractive. The price differential between South Australia water and water upstream of the pilot trial area in NSW and Victoria provides an attractive trading opportunity. Ignoring transfer costs, buying 175 ML (the average size trade from the pilot) could net $35,000 assuming a $200 price difference. Bouncing water into and then out of Victoria is less profitable than for NSW water due to the $129.60/ML salinity levy on all purchases of permanent water licenses in Victoria coming from upstream.

As long as the financial incentives exist, the market is likely to find creative means to circumvent the bouncing rules and the intent of other related policies. For instance, soon after the 2 for 1 conversion of low to high security water was offered in NSW, at least one entrepreneurial low security license holder converted to this holding into a high security holding and then sold on to South Australia. Others have purchased land to obtain the rights to the water then transferred this water to their South Australian property.

Nevertheless, both the States and the brokers[6] have tried to stop bouncing from occurring because it is not in the spirit of the trial. Indeed, we are aware of at least one case where brokers stopped a trade when they realised that one of the people involved was trying to bounce water into South Australia. Bouncing mechanisms include

- Converting low or general security water in NSW into tradeable High Security Water;
- One individual or entity trading intra-state into the trial region and then selling it over a border;
- Selling water over the border and then intra-state trading water into the area after the intra-state trade is completed possibly using different legal entities;
- Normal market arbitrage mechanism - some people buying water into the trial area and others trading it over a border. (During the trial, around 3 times the total inter-state trade has moved into the trial area).

Our research and surveys have identified a few cases of blatant bouncing, especially during the early stages of the trial, but our impression is that brokers and agencies are now doing their best to stop it as they wish the trial to proceed. It is our assessment that all transactions have been approved by State agencies and the MDBC only after carefully judging the circumstances and conditions of the proposed transaction.

As would be expected in a trial, administrative practices have been adapted as circumstances change. While, we recognise that subjective decisions on what constitutes intent to bounce by MDBC and/or State licensing officers exposes the inter-state trading system to counter-productive criticisms. It sends inappropriate market signals and opens the system to outside pressures. Nevertheless, we do not see it as a problem and expect indirect bouncing via arms length transactions[7] and what we call reverse bouncing (selling-out before buying-in).

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6 Several brokers have been proactively discouraging people from overtly trading water.

7 While water is in strong demand in South Australia and while intra-state trading into the trial area is possible then people with "surplus" water inside this area will sell it over the border while those looking for water will buy it in from areas higher up stream.

IMPACTS

Schedule E of the Murray-Darling Basin Agreement indicates that one of the main aims of the trial is ... "to improve the efficiency and effectiveness of consumptive water use in ways which facilitate environmental sustainability but which do not increase or accelerate environmental degradation." An unstated issue is that of the social impact of inter-state trading. We consider each of these issues in turn.

Economic Impacts

Providing that the environmental objectives are being met adequately, the simplest test for assessing whether or not inter-state water trading is increasing the efficiency of water use is to ask whether or not water is moving to more profitable uses. Our surveys and Commission data both confirm that this is definitely the case.

In virtually all (99%) of cases, the water traded was not being used at its origin and in virtually all cases it has moved to a very profitable use. Our survey of the buyers indicates that three quarters of all purchases caused an expansion of irrigation with 59% going into viticulture and 18% into horticulture. This is perhaps best illustrated by data on trades into South Australia where virtually all the water has gone into very high value uses. The bulk of the water (64%) has moved into the Riverland to water new vineyards, new horticulture, a recreation area and some olives. The water moving to the Lakes District at the very bottom of the Murray System is to facilitate the development of new state-of-the-art greenfields dairies. The dairy industry has been restructuring as a result of the removal of interstate barriers and pressures to concentrate ownership in that industry.

Table 5: Destination of trade (SA detailed)

Destination	n	Volume (ML)	Proposed use
Not SA	4	744 (8%)	Winery, Grapes, Citrus
The Riverland	20	6,596 (70%)	Grapes, Olives, Recreation
Barossa	8	403 (4%)	Grapes
Lakes Areas	10	1,499 (16%)	Dairy
SA holding licence	7	213 (2%)	For subsequent sale
Total	**51**	**9,455 (100%)**	

Our conclusion, **from an economic perspective and before any account is taken of environmental or social considerations is an unequivocal one. Inter-state trading is increasing the economic efficiency of water use in the Murray-**

Darling Basin. This is consistent with recent analysis by Bjornlund and McKay (2000a) who observed that this is also occurring with intra-state trading.

Social Impacts

From a social perspective, it is clear that many people are concerned that inter-state water trading or more specifically any water trading out of an area will have negative social impacts. In focus groups and in interviews, community leaders expressed concern about the erosion of the local government tax base as water moves out of their district. Others also expressed concern about the cost of maintaining the infrastructure for the remaining irrigators.

Various measures have been taken to address this concern in other areas. Central Irrigation Trust has placed a limit on what proportion of total entitlement can be sold out of any given district in one year. They argue that this ensures a slower and thereby more orderly process and allows irrigators and district authorities to adjust to the changing circumstances.[8]

While these arguments have validity, to date, inter-state trading has been limited to the transfer of unused water. In these cases, sale of the water has resulted in the welcome access to additional revenue. Indeed, a significant number of sellers we interviewed indicated that they had used this money to increase the area they irrigated bringing new investment and new employment opportunities to the district. In one instance, the proceeds from the sale were used to establish citrus. The seller knew that the water would be needed as the trees matured but planned to buy the water back as the need arose. From these observations, we conclude that, as far as we can detect, **inter-state trading during the two year trial period has had no direct adverse social implications for the districts that have sold water inter-state and in some districts it has had significant positive benefits.**

A significant social cost is the time taken to process a sale. In several cases, we are aware of special and awkward financial arrangements had to be made until a trade could be approved.

As already indicated, virtually all the water that has been traded has been associated with new state-of-the-art investments. Typically, these generate more employment, involve high-value product generation and considerable multiplier effects for the processing, tourism, transport and service sectors. Thus, we conclude that **inter-state trading during the two year trial period has had very positive social implications for the districts that have acquired water.** The only qualification that needs to be made is the observation that untraded water increases the security of other allocations and the quantity of sales water, etc that is made available to all other irrigators. The impact of this loss, when spread across all irrigators, however, is likely to be unmeasurable.

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8 In some US markets they have been required to deposit an amount in escrow sufficient to finance the proportion of maintenance expenses associated with the water purchased in perpetuity. Marsden Jacob (1999) has suggested exit fees amounting to the same thing as the US system.

Finally, a delicate issue is the relative wealth of buyers and sellers. Our surveys found that, buyers earn significantly above the average income and consider themselves among the top third within their area with respect to relative wealth. Sellers tended to have below average income and were in the bottom third in terms of wealth.

Environmental impacts[9]

Schedule E also commits participants to

> ".... establish a procedural framework and set of standards so that the Scheme is accountable and does not result in increased levels of salinity, reductions in environmental flows or degradation of the natural environment; "

These objects are met via a series of environmental clearance procedures. Consistent with Schedule E, we assume that the baseline for assessment of these issues is defined by the targets and goals set out in MDBC Strategies. The Schedule requires each State to provide a report to the Commission on the environmental impact of inter-state trading and these reports were made available to us. We were also provided with a copy of a 1999 review of environmental clearances for new irrigation developments in the Mallee region. This report observes that "the environmental clearances that are in place are intended to control specific environmental hazards. The history of irrigation in Australia demonstrates that consumptive water use (such as results from water trade) can present the following hazards to the environment:

- Environmental degradation at the point of origin;
- Diminished environmental flows;
- Environmental degradation at the point of destination;
- Off-site effects;
- Cumulative effects from a collection of individually non-hazardous developments;
- Incompatibility with other environmental management plans." (MDBC 1999)

As virtually all the water that is traded was not being used prior to the trade, the effect of trade at the origin is likely to be minimal. At the proposed destination potential adverse effects include:

- Discharge of drainage water and nutrients to the floodplain environment;

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9 This section was prepared with the assistance of Nick Watkins of Australian Water Environments. His input and knowledge of the environmental implications of water trading in South Australia is extensive.

- Inducement of saline native groundwater flow to the river and floodplain environment through the recharge of drainage water to underlying aquifers;

- Waterlogging and salinisation of surficial soils due to the presence of shallow, poorly draining soils;

- Modification/destruction of faunal habitat and flora due to land clearance and altered flow regimes;

- Visual impact of irrigation engineering infrastructure, and

- Reduction and changes in environmental flows.

All States have documented a range of detailed Statutory and licensing processes that can be applied prior to transfer approval.

Environmental flow considerations

Over the last two years, virtually all the water traded has involved previously unused water and the direction has been downstream.[10] From an environmental flow perspective, inter-state trading has meant that water previously held in storage and then allocated in subsequent years to all irrigators will now flow to South Australia. As a result, environmental flows to all areas upstream of the final destination will be greater. There is a possibility that seasonal flow patterns may alter slightly but this will depend upon the interdependence of permanent and temporary trades and also on the direction of intra-state trades. As noted earlier, essentially there is one market for water that extends from the Eastern side of the Basin to the Murray Mouth. Any attempt to separate the spatial impacts of permanent inter-state trading

[10] The Commission has modelled impacts on interstate trading of used water against a natural environmental flow benchmark but as virtually all the water traded over the last two years involves previously unused water it would not be correct to use these data.

from temporary intra-state trading and both temporary and permanent intra-state trading is likely to mis-interpret the nature of the market. The right question to ask is: " How are water trading arrangements and transactions affecting prospects for environmental improvement and trends in environmental conditions across the Basin?"

River Murray salinity impact considerations

Under Schedule E, ..."Any salinity debits or credits arising from the dilution effects brought about by water entitlement transfers to or from South Australia are to be assigned at the end of each financial year under Schedule C to the upstream State involved in the transfer concerned. ... Any salinity debits or credits arising from the dilution effects brought about by water entitlement transfers between New South Wales and Victoria are to be shared equally by those two States. ... Any salinity debits or credits arising from changes to salt accessions brought about by the operation of the Scheme are - (a) to be assigned in New South Wales and Victoria to the State in which the change occurs; and (b) to be treated as a requirement in South Australia for zero impact on salinity.

Policies regarding management of salinity impacts vary among States. The Department for Water Resources in SA is currently implementing a licensing condition that approval to use all inter-state trade water is subject to the completion of Irrigation Drainage and Management Plan (IDMP) that includes a Zero Impact Assessment (ZIA) to determine an irrigators future Salinity Prevention Obligation (SPO). This analysis provides DWR with information from which to negotiate with an irrigator regarding the irrigator's arrangements for future works which will address the impacts. It is our impression, that Zero Impact is being interpreted as zero impact now, but not zero impact for all time. To date, 10 inter-state transfers have been assessed for SPO's, representing a total trade volume of 6,613 ML (8,956 ML actually registered). The balance goes to the Lakes Area or the Barossa. That which goes to the Barossa will have minimal salinity impact on the River Murray. Arguably, that which goes to the Lakes Area has little, if any, impact on salinity in the River Murray.[11] A related issue is the fact that, in the past, salinity impacts in South Australia have not been recorded on the Murray-Darling Basin Salinity and Drainage Strategy Register.

Most of this volume of trade has been received into the Riverland area and the results of the ZIA analyses for these trades indicate that they represent a potential salt load impact to the River Murray of 6 t/day in 2020, and 37 t/day in 2050. Arrangements are not yet in place to offset these impacts but the obligations have been acknowledged. Earlier trades to South Australia were not subject to such arrangements.

These salt loads equate to EC increases at Morgan of 1.2 and 8.5 EC in 2020 and 2050 respectively, after accounting for the location of the transfer development.

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11 Some groundwater impacts may occur.

These impacts represent 75% of the potential impact of trade into SA to date, if outstanding registered transfers continue to be developed in a similar pattern to those assessed.

Economics has dictated the cross border movement of water into SA, but this produces the worst environmental result in terms of salinity increases at Morgan. This is a result of a range of factors including ribbon-type development along the River and the very saline nature of groundwater in the Riverland region in SA. Recent studies have documented in detail the salinity impacts of irrigation activities and water trading in SA (AWE, 1999 and AWE, 2000), and these impacts, once in progress, are costly to mitigate. Identification and implementation of Salinity Prevention Obligations and the requirement for Zero Impact Statements plus proposed new Salt Interception Schemes are designed to prevent inter-state trades from increasing South Australia's contribution to River Murray salinity. A related issue is the effect of inter-state trading on the River Murray Salinity Register established under the Murray-Darling Salinity and Drainage Strategy. In the time available to us, we were not able to identify whether or not approvals are matched by an adjustment to the register. Conceptually, the removal of an area from irrigation should count as a credit and the addition as a debit to be off-set.

Victoria has a number of policies that are designed to reduce the impact of water trading on salinity. Two, of particular note, are its $129.60/ML salinity levy[12] on all trades into the Sunraysia area and its prohibition of trades into the High Salinity impact areas.

At present, New South Wales is setting no levies and, as far as we are aware, has no equivalent of a salinity prevention obligation arrangement. As part of this State's salinity management strategy, however, it is proposed to introduce market mechanisms in the form of salinity credits and other similar arrangements.

Degradation of the environment

In addition to river salinity impacts and environmental flow impacts, it is necessary to consider environmental impacts likely to occur at the destination. Analysis of this issue is complicated by the South Australian practice of allowing transfers that involve the conversion of a licence to use water in NSW or Victoria into a Holding licence. Holding licences assign ownership of water but not the right to use it.[13] This means that it is possible to trade water into South Australia and then convert this holding into a taking licence at a subsequent stage.

A key consideration for inter-state trading and the quality of the Murray-Darling System in general is the question of the degree to which IDMP and SPO are enforced. In their reports both NSW and SA comment that a lack of Departmental

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12 The salinity levy can be paid over a ten year period and irrigators can generate salinity credits.

13 Arguably and under this interpretation trades of this nature involve no impacts as the trade involves a relocation of ownership but not use.

resources inhibits proper review of the approval and compliance process, even though the impact of water trade in SA is soon to be added to the Murray-Darling Salinity and Drainage Strategy Register (SKM and AWE, 2000). SA will be in a better position to enforce IDMPs when they are linked in a statutory sense to Water Allocation Plans.[14] We also observe that the recent review of environmental clearances for new irrigation developments in the Mallee Region observes that compliance with licence conditions is in the vicinity of 70% not the 100% necessary for a strictly conducted review to be able to report no negative impact.

Another issue to consider is the quality of management on buying versus selling properties. Our survey found that buyers are the more efficient irrigators. They have better irrigation methods with 59% using drip irrigation and only 12% flood or furrow irrigation whereas among the sellers 54% used flood or furrow irrigation and only 7% drip irrigation. Where the area irrigated was expanded as a result of the purchase, 71% had the new planting under drip irrigation. They have also been more active in the process of adjusting their irrigation and drainage methods in the past and have more active expectations of doing so in the future. Also, a larger proportion of the buyers managed their properties according to a whole of farm plan (96% v. 36%), use aids in the scheduling and monitoring of irrigation (96% v. 57%) and have better formal educational qualifications.

Overview

We observe first, that as the water being traded is almost entirely water that was not being used and as most trade has been down stream, **the environmental flow impact of inter-state water trading has probably been positive but, in all reality, the 10 GL is so small that this gain probably is impossible to measure.**

From a salinity perspective, the answer is qualified. Early trades into South Australia did not involve defining Salinity Prevention Obligations and, hence, can not be expected to have had a neutral impact on the environment. Later trades are subject to Salinity Prevention Obligations. Our conclusion is that **from a salinity perspective, so far inter-state trading has had a negative impact on river salinity but that if salinity prevention obligations are enforced then the long-term net effect of recent trades could be neutral. Salinity prevention obligations and other arrangements need to be monitored and enforced.** One way of helping to ensure this, is to include all trades in a salinity register and underpin this arrangement with a set of debit and credit arrangements. These arrangements could build upon the Victorian experience with trades from High Impact to Low Impact areas in the Nyah to Victorian Border region. Operationally, this would require mapping of all parts of the trial area as high or low impact areas and then establishing nominal debit and credit arrangement s for each area. Traders would then be free to choose between acceptance of the nominal debit and credit arrangements for each trade or paying for a full assessment.

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[14] This occurs when and as water allocation Plans are approved by the Minister for Water Resources.

With regard to environmental degradation at each destination, the answer depends upon the degree to which IDMPs are enforced and the standard they set. All States express problems in monitoring compliance with these plans, so one can not be confident.

To ensure long-term delivery of the trial's environmental objectives, **Salinity Prevention Obligations should be recorded on the licence. Failure to comply with the obligation should result in the sale of sufficient water to finance restitution of the obligation. In cases, where the purchaser is required to set aside money, this money should be put aside in a trust account.**

Finally, we observe that inter-state rules could create a false sense of security. In the pilot area, inter-state trading accounts for less than 1/100th of the water used in irrigation.

ADMINISTRATIVE ISSUES

The impact of water right definitions on the direction and nature of trades

Holding licences

The nature of water rights in each State appears to be an important factor influencing inter-state trade. During the review period, South Australia was the only State that permitted people to acquire and hold a water entitlement without owning land with a water (taking) licence attached to it.[15] This allowed purchasers to buy water without going through the environmental clearances, reducing substantially the time required to complete a trade. The attractiveness of the regime is demonstrated by the fact that 6 lots of water were transferred to South Australia by a person who lives in Victoria. The total volume involved is 218.6 ML or just 2.2% of the total volume traded during the trading period. All this water was then on-sold in South Australia.

The pilot experience does not provide evidence suggesting that the holding licence influences the direction of trade, but it does provide evidence that it speeds up the trading process.

Policy uncertainty

Two policy issues are influencing the market for water in NSW.

The first issue relates to Aboriginal Land Title. NSW land owners are more effected than the other States by native title issues (due to the high proportion of their land in lease hold that is located along that part of the River Murray that is in the Western Division). The uncertainty created by the native title issues reduces the incentive for people to try and convert a Western Lands Lease into a form that would allow irrigation. Some perceive that, under current arrangements, it is not possible for them to consider irrigating these lands.

The second issue relates to water reform. Unlike other States, NSW is still in the process of reforming its legislation and, at the time of this review, has new water reform legislation before its Parliament. In our opinion and as a result of discussions we have had with NSW irrigators, we suspect that the uncertainty associated with both of these processes is having a significant affect on inter-state water trading.

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[15] Legislation recently passed by the NSW Parliament will allow NSW people to enter into a similar arrangement. In Victoria, all water licences are attached to a land title.

Exchange rates

To limit third party impacts, Schedule E sets out detailed arrangements to ensure that State Cap and Water accounting arrangements for storages, like the Hume Reservoir, are not distorted by inter-state trade. In particular, the Schedule provides that

"...The water cap in respect of the State of origin is to be lowered, and the water cap in respect of the State of destination is to be correspondingly raised, to ensure that the total level of off-stream diversions remains within the total of the respective water caps of the States.

...

(4) The exchange rates are to take into account -

(a) losses through transmission in the river channel; and

(b) losses through changes in the level of security for the supply of water, resulting from the operation of the Scheme.

An environmental bias is also built into the scheme. In particular, the Schedule E, section 7(8) states that

... "Any such gains are to be set aside by the Commission for environmental purposes. The Commission is to establish an account in respect of these gains. " and then goes on to say that ... "subclauses 7(8) must be applied before all other exchange rates."

For the pilot project, exchange rates were implemented in relation to security and the CAP. The pilot project includes private diverters and individuals within pumped irrigation districts from Nyah to the barrages at the mouth of the River Murray and only includes high security water entitlements.

- The **Security exchange rate** is 1.0 for transfers from New South Wales or Victoria downstream to South Australia. Although transferring water allocations from New South Wales or Victoria to South Australia results in an increase in security, the exchange rate has been conservatively set at 1.0. This effectively allocates the increased security to the river environment rather than to the buyer. A transfer from South Australia to New South Wales or Victoria has a security

- exchange rate of 0.9 to counteract the reduced security of supply upstream of the Darling River and Lake Victoria[16]. This accommodates any losses through changes in the level of security for supplying water and to ensure that the overall security of the system is not compromised, ie. that other users are not adversely affected by the trade.

- The **Cap exchange rate** for all transfers is 0.9, based on the principle that, on average, high security irrigators use only 90% of their annual allocations. Because the Cap is managed on a valley basis, the Cap exchange rate is not applied to the individual traders. Thus an individual irrigator does not have to be concerned with the Cap exchange rate. The overall reduction of the Basin Cap protects the security of water users and provides some compensation to the environment for the reduction in flow into South Australia. The necessary adjustments are made and registered by the MDBC.

At present, the exchange rate for extent of over-allocation, salinity impact, security of tenure, etc is implicitly one to one. States also have the option of applying their own exchange rates either before or after an entitlement is transferred, but at this stage these have not been applied.

The results and implications for individual buyers and sellers are summarised in Table 6.

[16] This rate was based on the contribution that the Murray makes to flows downstream of the Darling Junction during regulated periods, and this averaged 89%. This was considered to be an appropriate allowance for the impact of the Darling and was rounded up to 0.9 for the pilot project.

Table 6 Summary of exchange rate arrangement currently operating in the trial trading area

From (seller)	Property Right	To (buyer)	Property Right	Exchange Rate (Security)	Volumes (ML)
NSW Murray	High security	Vic Murray	High security	1.0	100 ➨ 100
NSW Murray	High security	SA Murray	High security	1.0	100 ➨ 100
Vic Murray	High security	NSW Murray	High security	1.0	100 ➨ 100
Vic Murray	High security	SA Murray	High security	1.0	100 ➨ 100
SA Murray	High security	Vic Murray	High security	0.9	100 ➨ 90
SA Murray	High security	NSW Murray	High security	0.9	100 ➨ 90

Note, the Cap exchange rate (of 0.9) is not applicable to the individual trade but is applied at the State level.

The brokers and focus groups we met with expressed a great deal of concern and confusion over the exchange rate arrangements. Generally, they do not understand why they exist, how they were determined and how often they may be changed. Some NSW and Victorian irrigators see the current exchange rates as being "unfair."

With most of the inter-state water moving downstream due to price differences of such magnitude that it is difficult to determine how exchange rates are influencing trade.[17] Indeed, there was only one upstream trade. This was a 100 ML transfer by a firm that was effectively selling water to itself. Water was transferred permanently from a vineyard in South Australia to the same firm's winery in NSW. As a result, the SA Cap was reduced by 90 ML, the NSW Cap was increased by 81 ML and the environmental account should have been increased by 9 ML. At the time of writing this report, however, this environmental account entry had not been made. We have been assured, however, that this will happen.

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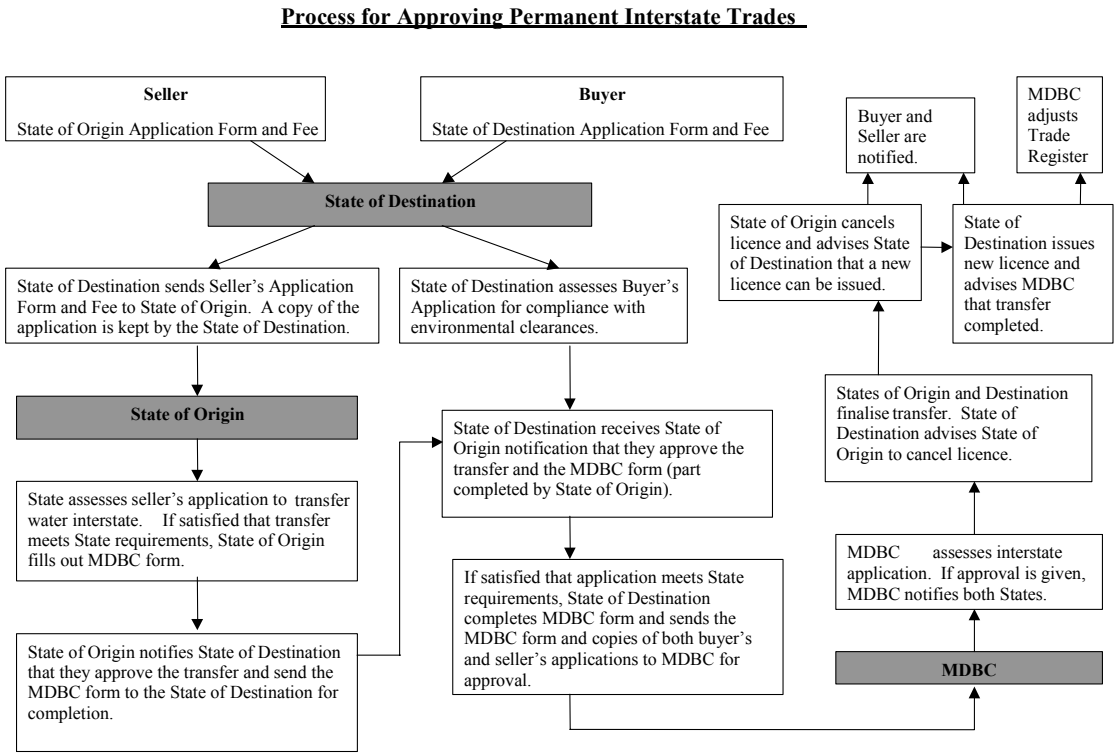
17 We suggest that as States review these arrangements, they model differences in actual water allocations for a range of typical irrigation licences in each river reach and licence type that is traded. This could reveal that current exchange rate arrangements are not trading "apples for apples" - as they say.

The impact of administrative and institutional arrangements on the volume and direction of inter-state water trades

The overall process for transferring permanent water appears to be relatively straightforward. In practice, it is time consuming. Inter-state trades are made more difficult and confusing due to state specific rules and requirements that add extra layers of complexity. Figure 4 shows the nature of the processes involved as agreed by States in 1997. As can be seen, the process is quite complex.

Figure 4 Inter-state trading arrangements *



* During our review, we came across a number of situations where trades where the cancellation of a licence in one State and the issue of a licence in another was not well synchronised. Elsewhere, we recommend arrangements to avoid these situations arising again.

These diverse, state-specific trading rules, application forms and registration and licensing procedures add substantially to the amount of time required to complete an inter-state trade.

In all three States, water licensing officers process both inter-state and intrastate water trades following similar steps:

(1) State application forms are submitted with payment for transfer fees (no extra transfer fees are charged for inter-state transfers);

(2) State officers check that forms are completed correctly;

(3) the seller's land title is examined for obligations against the land (NSW and Victoria);

(4) the seller's water licence is examined to identify any obligations or outstanding fees (meter fees, levies, water use charges, etc);

(5) environmental clearances (including irrigation and drainage requirements) are assessed and cleared by appropriate State officers;

(6) transfers are approved and licenses are registered and issued.

State Differences

State differences in permanent water trade include, among other things: the purchaser and seller application forms; the recording methods; the approval and issuing procedures; the type of information collected from buyers and sellers; the methods for obtaining and approving environmental clearances; the water licence registration system; and the type of water eligible for trade (high or low impact areas, high or general security, temporary or permanent).

State specific procedures have evolved over time to meet requirements established by National (eg COAG) and regional (eg MDBC) initiatives, as well as local policy and legislation. Legislative responsibilities for water rests with State governments and many decisions that affect how water is used occur at the local level. The result is that water is differentiated in terms of location, quality, environmental constraints and security of supply.

Important examples of State specific requirements that influence the inter-state water market include:

In Victoria

- A $129.60/ML salinity levy applies to all permanent trades from inter-state or from the Goulburn-Murray Irrigation District. The salinity levy can be paid over a ten-year period. These levies pay for Victoria's contribution to generating Salinity Disposable Entitlements (SDEs). This levy substantially effects the purchase price of inter-state and upstream water in the Sunraysia district.

- Sellers must advertise their intent to sell for, at least, four weeks prior to the approval. It is the seller's responsibility to advertise.

- Trades into high impact areas are not permitted.

- Water availability on the seller's property is checked (to see if the sale results in too little water for a viable operation).

In New South Wales

- Native title and land rights issues appear to be preventing the movement of water in NSW into potential irrigation areas in the Western Division.[18] Moreover, NSW irrigators are affected more by native title issues due to a relatively high proportion of lease hold land.

- The intent to buy must be advertised for at least four weeks prior to the purchase being approved. The Department of Land and Water Conservation is responsible for advertising in the local newspaper and the government gazette.

- The important difference between NSW and Victoria is that once approached by a prospective seller from Victoria, a knowledgeable broker will advertise immediately. In contrast, in NSW, the advertisement takes place in the middle of the trading process.

- Licenses are issued for a five-year period.[19] In principle, the five-year period triggers a new environmental clearance. In practice, water licences are reissued without the clearance.

- Settlement can occur well before the water licence is issued legally. Once the trade is approved, the DLWC awaits notification from the broker that the settlement has been made before issuing a licence.

- The time delay between when a new NSW licence is approved and when that licence is issued legally provides a loophole for both the seller and the purchaser (who has a legal license in South Australia or Victoria) to both use the water. In practice, it is more common for the seller to consider the settlement date as the legal binding date. However, the sellers are unhappy when they receive water charges and fees up until the date the new (reduced) licence is issued or cancelled.

- One contrast between NSW and the other States is their practice of assigning a separate licence number to each transfer. Other States amend the existing licence so that registration systems remain integrated. Indeed, the NSW systems is so much more complex than that in other States that one broker commented to us that it was easier to permanently transfer water inter-state than to another location within NSW.

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[18] This is asserted by people from the Western Division. We have not seen a rigorous study that would suggest that this part of NSW has sufficient potential to out compete potential irrigation areas in other parts of the State or the trial trading area.

[19] Recent legislation passed by Parliament will result in licences being issued for 15 years with a 10 year review.

In South Australia

- A holding license can be purchased without environmental clearances. This speeds up the trading process.
- This inter-state water purchase is tracked so that the irrigator meets the necessary environmental clearances, including the Salinity Prevention Obligation (SPO) and the IDMP.
- The SPO is only required for inter-state purchases. The SPO outlines the water purchaser's financial and management obligations to offset any salinity impacts over time. For instance, purchasers have been agreed to obligations to plant trees, plan for remediation, set aside funds, etc. before receiving approval.
- One difficulty facing South Australia's Department of Water Resources is how to legally bind this obligation to the land where the water will be used. At present, no such mechanism exists.
- The environmental assessment of the buyer's IDMP and SPO is a significant time related issue. Recently, a service agreement was reached requiring assessors to meet a six-week maximum period for approvals.

Intra-state issues

Many of the difficulties arising from the differences in State application forms, rules, processes, fees, and clearances were addressed successfully during the initial stages of the pilot program. Examples include:

- Individuals, such as Joan Vandewerdt, helped to increase communications between State offices and to clarify the steps involved in inter-state trade. (See Figure 4 *Process for Approving Permanent Inter-state*.)

- As brokers gained knowledge about how the system worked, they adapted their practices to speed it up. For instance:

    - brokers now require potential purchasers to obtain all the necessary environmental, irrigation, drainage and land use clearances before submitting the application (at the beginning of the pilot project, brokers would submit applications before obtaining land clearances);

    - brokers learned to use express post, to follow up the postal system with phone calls, to confirm that documents have arrived, are completed properly and are in the proper queue;

    - brokers began collaborating with each other to better understand differences in State processes;

    - Most of the recent trades arrive in South Australia as a complete package, including the seller's and buyer's applications with the IDMP and SPO approval (unless it's a holding licence which does not require environmental clearances).

Much more experience may be required to iron out additional problems, especially if water begins trading in significant volumes from SA into NSW and/or Victoria. SA has little experience processing inter-state water sales and NSW and Victoria have little experience processing inter-state water purchases.

In spite of these time and cost saving solutions, the inter-state trades remain burdensome, complex, time consuming and administratively intensive. Data from the pilot sample survey indicate that water purchasers reported that more than 70% of the trades required more than 3 months and 34% required more than 6 months. It is difficult for water purchasers and sellers to understand why it should take so much longer to trade in water than it does to trade in land.

Our interviews with brokers suggest that potential traders are discouraged by the time and effort required to complete an inter-state trade. The problem is likely to be worse for small volumes of water. Table 7 summarises the information we received from interviews. Because of the strength of comments in this area, we also examined the administrative process for 10 randomly selected trades. The fastest trade took 52 days and the longest took 185 days. A typical trade takes 133 days. If the standard Australia Post mail system is used, the application process can involve forms spending 31 days in the mail travelling from location to location.

Some of these time and cost saving issues can be addressed directly by the State department offices and the MDBC. Others are more difficult, requiring State level ministerial or legislative changes. The pilot experience presents important lessons on the need to streamline the process and harmonise the differences in application forms, approval processes, recording methods, transfer fees, and environmental clearances throughout the Murray-Darling Basin.

Table 7 Purchaser perceptions of the perceived time required to complete an inter-state trade

Time	Number	Percent
Less than 3 months	6	29%
3 to 6 months	8	38%
7 to 12 months	5	23%
12 to 18 months	2	10%

Among the issues are the following:

- The State water officers are over stretched. The quantity of intrastate and inter-state trades continues to increase over time. The NSW office, for instance, has some 50 to 60 trades in some stage of processing at any one time.

- In the long run, there is a need to simplify and harmonise the rules, procedures and application forms across the MDB.
- In the long term, States need to produce a single MDB water trade application form accepted by all States.
- In the short term, increase the pool of licensing officers to provide backup and increase flexibility.
- In the short term, provide resources for the three State water licensing officers to meet periodically. Water licensing officials are well placed to decide how to streamline the various application and registration forms, how best to collect data, and how to improve registration systems. Many processes could be simplified by the State licensing officers sitting down in the same room to develop more rapid transfer systems based on mutually agreed solutions and to improve monitoring.[20]
- The postal service slows down the process. Before final approval, an inter-state trade application is likely to need posting at least eight times. If all this is done by regular post, an average of four days per mailing means applications spend 32 days in a bag.
- Allow forms to be faxed or express mailed. Applicants should be given the option of paying for express couriers.
- Signatures and authorizations are a nontrivial source of delay. Signatures are required by ministerial delegates for the States and the head of the MDBC.
- State should provide alternative delegates. The role of the MDBC could be clarified.
- The inter-state water project is heavily dependent on specific individuals. In addition to having one broker involved in the majority of the transactions, the State water licensing officers have built up highly specialised, administrative knowledge and skills. As these people move on the system will slow down.
- The inter-state system needs to ensure that title to water changes hands at the same time as payment.
- Changes in NSW water laws (expected January 2001) will impact on how water licences are held used and traded. This new legislation has important implications on how the State will process water titles.

[20] We were surprised to find out that the three administrators had never actually met face to face.

EMERGING CONCLUSIONS

The pilot project has allowed 51 trades involving 9.8 GL of water to move across Borders in the Basin. The approach taken by those responsible for its implementation is to learn by doing. Changes are and have been made along the way. **Provided that this spirit of adaptation and willingness to solve problems as they emerge continues, we see no reason to stop the trial. We can, however, see opportunities for improvement as well as risks if this process of adaptation does not continue.**

The net direction of the water has been to South Australia. The movement of water appears to be driven by demand and supply factors. In a limited number of cases the pilot has allowed corporate entities to move a valuable asset between locations within related companies.

The relatively limited supply of water for irrigators in South Australia combined with an increase in demand for water, mostly from the wine industry, is forcing up the price of water. Without the inter-state trading project, it is likely that the price of water would have risen further in South Australia. Inter-state water trading is assisting with the reallocation of water to places where it can add the most value. So far, inter-state trade has been associated with social improvement. The environmental impact of inter-state trading depends on the manner and degree to which each State complies with salinity target and related arrangements.

Perceptions held by buyers, sellers and brokers involved in the market place

Pilot project buyers and sellers want the best possible value for their purchase or sale. Survey results indicate that traders placed no importance on where the water comes from or where it goes. Respondents suggest that any future water market activity should enable them to buy from the cheapest source available at the time or sell to the highest bidder.

The only stakeholders with reservations about water trading as a general concept are local councils, some water supply authorities and some community representatives. Some councils are concerned that water trading could cause land values to plummet; some water supply authorities are concerned that trading could leave them with unserviceable infrastructure debts; some communities fear that the result could be a decline in economic activity.

We found no direct evidence that inter-state water trading is contributing to these perceived problems. In addition, one group of irrigators expressed concern that water market opportunities are passing them by and even causing some problems. Their major water related issue is how to gain more (or even some) control over the decision making and management of their water delivery service in Sunraysia. Their

concern over water markets in general (not the inter-state program in particular) is that frustrated irrigators are selling water leaving the remaining producers to pick up an ever increasing share of the fixed management, maintenance and delivery costs. These above issues are water-trading issues, as a whole, not ones specific to the inter-state trading in the trial area.

Some districts are attempting to addressed this concern. For instance, the Central Irrigation Trust sets limits on the proportion of total entitlement leaving any given district in one year. The aim is to ensure a slower and more orderly process, allowing irrigators and district authorities to adjust to changing circumstances.[21]

Another group of irrigators (from NSW) do not understand why the government can not just open up the entire system to trade and let the market allocate water. The MDB should be treated as a river basin and not ruled by separate States, each imposing a different set of laws, taxes, and other policy distortions. The governments should focus on providing good information, infrastructure and environmental monitoring services and allow the irrigators to make their living in a more certain policy environment.

The brokers were unanimous in their views that before expanding the pilot several issues need to be addressed. These include:

- the most pressing issue is establishing a simpler, quicker more transparent water registration system;
- inconsistencies among State procedures, processes, water rights, information requirements, penalties, data collection and recording methods within the existing pilot trading area;
- expanding the project area upstream introduces more complications further delaying trades, placing ever greater work loads on already over-stretched State departments, increasing transactions costs and lengthening time delays;
- expanding the system before these issues are addressed and expanding the project in stages creates even more uncertainty.

[21] In some parts of the USA, buyers are required to deposit an amount in escrow sufficient to finance the proportion of maintenance expenses associated with the water purchased in perpetuity. Marsden Jacob (1999) suggests introducing of exit fees.

Our Perceptions and findings

Having reviewed that administrative processes associated with water trading we concur with brokers. Priority should be given to simplifying the administrative system. Consideration also needs to be given to the way that titles are registered and trades settled. **As a minimum and as trades can involve transactions valued at over a million dollars, we consider that the standards set and settlement procedures used should be similar to those that apply to dealings with Torrens Titles for land** - the template is sitting in front of us.

There is an opportunity for orderly expansion of the inter-state pilot project if some of the administrative processes are streamlined and harmonised across States. There are two ways to approach harmonisation.

The first approach would involve incremental changes to simplify the system. For instance, having the licensing officers responsible for inter-state trades meet and work out some time saving steps would be a good first step. They would put together a list of the administrative items such as providing traders with the option of paying for having forms couriered between locations.

The second approach is to undertake large-scale inter-state reforms where the administration across States is reviewed in detail. For a review of this nature to be successful, the States would have to be committed to simplifying the system. There are significant opportunities to identify what information could be stored centrally and what could be shared. There are also considerable opportunities to improve record keeping and licence registration arrangements.

The delineation between temporary trade and permanent trade in water is somewhat unclear. As there can be delays between a trade being finalised. Clear rules are required to make clear how water traded in an irrigation season will be treated.

Under current arrangements there appear to be cases when a licence could be used in two places at once. There are two options here. Under option one, a clear annual water settlement date is put in place and annual accounts adjusted accordingly. Under option two, all inter-state trades are deemed to settle on, say, 1st July. Where appropriate, a "within-irrigation" year trade would also occur by what is typically known as a temporary trade. Either method, as well as simplifying the settlement process, would make adjustment of water storage and flow management accounts easier. **We suggest that all permanent trades be deemed to take effect from the 1st July after the date of settlement.**

Under current arrangements, adjustment for river salinity impacts is unclear - especially when river salinity impacts are expected to increase with time. For the 6.7 GL that has moved into the Riverland of South Australia and was not previously being used, there is a potential salt load of 6 tonnes per day in 2020, and 37 tonnes per day in 2050. South Australia is addressing this issue by requiring purchasers to prepare IDMPs that contain a Zero Impact Assessment and commit the irrigator to a Salinity Prevention Obligation. If inter-state water is sold again, it is unclear what happens to the Salinity Prevention Obligations. At present, this obligation, which may be a perpetual one, is not recorded on the water licence or land title. Practice in

other States is different but equally imprecise as to final outcome. All depends upon the quality of plans and the degree of enforcement. The Trial's aim to ensure that inter-state trading does not "result in increased levels of salinity" is not guaranteed.

As salinity targets are set for each valley in the Basin, many if not all the issues associated with the impacts of intra-state trade on river salinity may be more effectively dealt with via a Salinity Register. Alternatively, **a simple set of salinity credit and debit exchange rates could be established so that trading costs and delays can be kept to a minimum. A cleaner approach might be to set up a set of salinity exchange rates and link these into State or valley salinity registers.**

Moving water downstream to be used in the Riverland of South Australia has the severest implications in terms of salinity. South Australia has been put on public notice[22] that, as far as inter-state trade is concerned, it may not be living up to its obligation to have a neutral river salinity impact. The same can probably also be said of the other States but as yet there have been few trades in this direction and little that has involved the removal of irrigation from an area. It depends upon how all States implement and enforce Salinity Prevention Obligations and their equivalent. We note, however, that these comments could create a deceptive sense of false security. Inter-state trading accounts for less than 1/100th of water applied to crops in the trial area. It would may be more cost-effective to treat salinity impacts separately from inter-state trading issues.

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[22] Negotiation for the inclusion of South Australia on the MDBC Salinity and Drainage Strategy Register are in the final stages and are expected to commence with a 30 EC debit to South Australia.

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APPENDIX 1THE MURRAY-DARLING BASIN AGREEMENT SCHEDULE E - INTER-STATE TRANSFER OF WATER ALLOCATIONS (SELECTED EXTRACTS)

Objects of Schedule

1. The objects of this Schedule are as follows -

(a) to facilitate and promote the interstate transfer of water allocations co-ordinated by the Commission;

(b) to provide for the Scheme to be implemented on a trial basis in that it will initially only apply to specific water diverters and districts, and to high security water allocations and to a restricted part of the Mallee region;

(c) to improve the efficiency and effectiveness of consumptive water use in ways which facilitate environmental sustainability but which do not increase or accelerate environmental degradation;

(d) to establish a procedural framework and set of standards so that the Scheme is accountable and does not result in increased levels of salinity, reductions in environmental flows or degradation of the natural environment;

(e) to provide for the suspension of the operation of this Schedule if there is an increase in, or acceleration of, environmental degradation from the use or management of water that has been diverted interstate in accordance with the Scheme;

(f) to give effect to water trading arrangements in accordance with the terms of the Ministerial Council's decision regarding the long-term level for off-stream diversions in the Murray-Darling Basin;

(g) to enable the Commission to adjust the quantity of water to be delivered to the States as a result of the Scheme. ...

Application of Schedule

3. (1) This Schedule applies to water allocations -

(a) that are supplied from the River Murray between Nyah and the barrages; or

(b) that are River Murray licences supplied from the Lock 10 weir pool.

(2) This Schedule applies to high security water allocations described-

(i) in New South Wales as high security entitlements; or

(ii) in South Australia as water licences granted under the Water Resources Act 1997; or

(iii) in Victoria as private diversion licences or pumped district water rights.

(3) This Schedule applies to and in respect of that part of a water allocation that is proposed to be transferred permanently, ...

(4) This Schedule does not apply to temporary transfers of water allocations.

Suspension of Schedule

4. (1) A State Contracting Government may from time to time, after consultation with the Ministerial Council, suspend or limit the operation of this Schedule in that State on the grounds that the State Contracting Government considers that -

(a) there has been an increase or acceleration of environmental degradation resulting from the use or management of water diverted pursuant to the transferred water allocations; or

(b) inadequate progress has been made by any one of the States involved in the Scheme in achieving full cost recovery water pricing. ...

PART II - GENERAL OPERATIONAL PROVISIONS

Adjustment of delivery of State entitlements under Part X of the Agreement

5. (1) The delivery of water pursuant to each State's entitlement under Part X of the Agreement, and the water accounting provisions under that Part, may be adjusted by the Commission in order to take into account, and to give effect to, the Scheme.

(2) Water deliveries to South Australia are to be increased by a volume equal to the adjusted net balance of water allocation transfers into that State as recorded in the transfer register at the end of each financial year.

(3) The supply of water by New South Wales and Victoria to South Australia under clause 93 of the Agreement is to be increased in each case by a volume equal to the adjusted net balance of water allocation transfers into South Australia from the State concerned as recorded in the transfer register at the end of each financial year.

(4) The delivery of water in the Hume Reservoir to New South Wales is to be increased by the adjusted net balance of water allocation transfers from Victoria to New South Wales as recorded in the transfer register at the end of each financial year, and the delivery of water in the Hume Reservoir to Victoria is to be decreased by that same amount. In accordance with sub-clause (8), a transfer from New South

Wales to Victoria would equal a negative net balance of water allocation transfers from Victoria to New South Wales.

(5) During any special period of accounting declared by the Commission (referred to as a period of special accounting), the Special Accounts of State diversions under paragraph 124 (a) of the Agreement are to be decreased by a volume equal to the adjusted net balance of water allocation transfers into the State concerned as recorded in the transfer register.

(6) The Special Account of water supplied to meet the entitlement of South Australia under paragraph 124 (c) of the Agreement is to be decreased by a volume equal to the adjusted net balance of water allocation transfers into South Australia from the State concerned as recorded in the transfer register.

(7) Adjustments under sub-clauses (2) - (6) are to be made in equal amounts in the months of September to April inclusive. If South Australia's entitlement is restricted at any time in accordance with clause 127 of the Agreement, those restrictions (that is, the same percentage reductions) are to apply in relation to the adjustments.

(8) For the purposes of this clause, the adjusted net balance is the net balance of water allocation transfers following adjustment by the application of the exchange rates determined under sub-clause 7(1). Any such adjusted net balance may be a positive amount or a negative amount.

Adjustment of water cap

6. (1) The water cap in respect of each Contracting Government is to be adjusted by the Commission:

> (a) to maintain the integrity of the overall water cap for the Murray-Darling Basin; and
>
> (b) to reflect the water allocations that have been transferred interstate under the Scheme.

(2) The water cap in respect of the State of origin is to be lowered, and the water cap in respect of the State of destination is to be correspondingly raised, to ensure that the total level of off-stream diversions remains within the total of the respective water caps of the States.

(3) For the purposes of adjusting the water cap in respect of a particular State, a water allocation that is transferred interstate under the Scheme -

> (a) is taken to have been fully used (or by such lesser proportion as may be determined by the Commission) in the State of origin; and
>
> (b) is taken to have been transferred for full use (or by such lesser proportion as may be determined by the Commission) in the State of destination.

Exchange rates

7. (1) The Commission is to determine exchange rates for the purposes of the Scheme.

(2) The exchange rates are set out in the document called "Exchange Rates for the Inter-State Transfer of Water Entitlements in the Mallee Region" issued by the Commission.

(3) The object of exchange rates is to limit the impact that any particular transfer in accordance with the Scheme might have on other water users.

(4) The exchange rates are to take into account -

(a) losses through transmission in the river channel; and

(b) losses through changes in the level of security for the supply of water, resulting from the operation of the Scheme.

(5) The Commission may vary the exchange rates from time to time.

(6) Water allocations that are transferred interstate under the Scheme:

(a) are subject to any adjustment by the Commission at the time of the transfer so as to give effect to any losses identified under the exchange rates; and

(b) are not to be increased so as to give effect to any gains identified under the exchange rates.

(7) Any such gains are to be set aside by the Commission for environmental purposes. The Commission is to establish an account in respect of these gains.

(8) A State of origin may also determine exchange rates for the purposes of adjusting the volume of water in respect of a statutory entitlement in order to reflect the amount of water that has been used under the entitlement.

(9) The exchange rates referred to in subclauses 7(8) must be applied before all other exchange rates.

Charges

...

Salinity and drainage strategy

...

9 (2) Any salinity debits or credits arising from the dilution effects brought about by water allocation transfers to or from South Australia are to be assigned at the end of each financial year under Schedule C to the upstream State involved in the transfer concerned.

(3) Any salinity debits or credits arising from the dilution effects brought about by water allocation transfers between New South Wales and Victoria are to be shared equally by those two States.

(4) Any salinity debits or credits arising from changes to salt accessions brought about by the operation of the Scheme are -

(a) to be assigned in New South Wales and Victoria to the State in which the change occurs; and

(b) to be treated as a requirement in South Australia for zero impact on salinity.

Environmental and supply considerations

10. (1) The licensing authority of each Contracting Government must, in assessing or determining any proposed transfer of a water allocation under this Schedule, ensure that:

(a) the licensing authority takes into consideration the Ministerial Council's policies on environmental flow management; and

(b) the proposed transfer is not inconsistent with those policies.

(2) The licensing authority of each Contracting Government must ensure that -

(a) any water allocation that has been transferred to the State under the Scheme; and

(b) the use of water diverted pursuant to such a transfer,

are subject to the same regulatory provisions and environmental considerations that apply in respect of water allocations granted by the licensing authority in the State and in respect of the use of water diverted pursuant to an intra-State transfer.

(3) The environmental considerations referred to in sub-clause (2) are set out in the document called "Environmental Clearances for New Irrigation Developments in the Mallee Region" (as approved by the Ministerial Council from time to time), and may include such matters as land use development, movement of water between high and low impact zones, channel capacity, clearance of native vegetation, on-farm irrigation standards, consideration of ground water accessions and surface drainage.

PART III - PROCEDURAL PROVISIONS

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