
10 Overcoming impediments

Key points

- The 4 per cent limit on out-of-area trade of water entitlements should be eliminated as soon as possible. Limits on the amount of entitlements that can be sold to the Commonwealth through the buyback should also be eliminated.
- New rules for termination fees present less of an impediment to the buyback than the previous rules. It is likely, however, that termination fees are still excessive in some areas.
- Irrigation infrastructure operators that are concerned about the potential for ‘Swiss cheese’ buybacks to reduce the competitiveness of their irrigation area can help manage this issue themselves by introducing more cost-reflective pricing of water delivery.
- Ways to expand choices about intertemporal water use should be investigated. This might involve changes to carryover provisions, or wider adoption of capacity sharing.
- The buyback will not achieve the intended environmental outcomes unless land management practices are coordinated with environmental watering.

Rural water markets are relatively well developed in Australia. Progress with water reform is helping to create an environment that is more conducive to conducting an effective and efficient water buyback. Reform continues to be pursued, guided by the National Water Initiative (NWI). In addition, the *Water Act 2007* (Cwlth) gives the Australian Competition and Consumer Commission (ACCC) an enhanced role with respect to water market rules and charges.

Notwithstanding these positive developments there remain significant impediments to the efficient operation of water markets, as documented in the National Water Commission report: *Australian Water Reform 2009*. These often undermine water buybacks.

This chapter identifies impediments to the recovery of water for the environment in the Murray-Darling Basin (the Basin) and how they might be overcome. As required by the terms of reference, the focus is on impediments to water buybacks. Both direct impediments (which impede the effectiveness and efficiency of

purchasing water for the environment) and indirect impediments (which can compromise the achievement of the desired environmental outcomes) are covered.

10.1 Reducing volumetric restrictions on trade

Volumetric restrictions on trade within the Basin can prevent the transfer of water from low to high value uses. These restrictions can impede government buybacks of water for the environment as well as irrigator-to-irrigator trade.

Reforming the 4 per cent limit on trade in entitlements

Under the NWI an annual limit (or cap) of 4 per cent on the level of permanent trade out of all water irrigation areas is permitted. While jurisdictions can not set a more restrictive limit, there is discretion to set a less restrictive one, or have no limit at all. Trade in seasonal allocations has no such limit.

Water entitlements bought by governments for the environment are generally treated as trade out of an area, and so count towards the limit. An exception is where land and entitlements are purchased together.

The current situation

The application of the limit in Victoria is most often cited as a barrier to trade. This is because, in this state:

- the limit is applied to relatively small areas, meaning that a relatively high proportion of trades are inter-area trades (this situation changed to a modest extent in January 2010, when the Victorian Government merged the district of Robinvale, Red Cliffs and Merbein with the First Mildura district (Holding 2010))
- disassociating an entitlement from land is counted as trade out of an area, even though the owner and location of use of the water may not change as a result of disassociation
- the limit is generally enforced, whereas in some other states, such as South Australia, the limit has not been enforced and/or less restrictive limits have been set.

The limit was binding in Victoria even before government purchases of entitlements became a significant component of trade. As government purchases have increased, the limit has been binding in more areas and the limit has been reached earlier in the

irrigation season. In 2008-09, 8 out of the 10 irrigation districts reached the limit and 94.5 per cent of Victorian high-reliability entitlements held in irrigation districts were within a district that had reached the limit (Frontier Economics 2009). The limit was also binding in the Murrumbidgee Irrigation area of New South Wales in 2008-09 (NWC 2009b).

With regard to 2009-10, the Department of the Environment, Water, Heritage and the Arts (DEWHA) reported:

Already in the current water year (2009-10), the limit has been reached in five districts for high reliability water (Central Goulburn, Murray Valley, Pyramid-Boort, Torrumbarry and Robinvale, Red Cliffs, Merbein) and one district for low reliability (Murray Valley). So far in 2009-10, trade approval for Australian Government purchases worth in excess of \$80 million has been denied due to the operation of the Victorian four per cent rule. (DEWHA, sub. 56, p. 11)

In 2008, the Council of Australian Governments (COAG) stated an ambition to raise the limit to 6 per cent by the end of 2009 (COAG 2008a). More recently, attention has moved to specifying exemptions to the limit to facilitate water recovery for the environment. Most significantly, the Australian and Victorian Governments have agreed to exemptions that reportedly will enable the Australian Government to purchase 300 gigalitres (GL) more in water entitlements over five years than it would be able to under strict application of the 4 per cent limit (that is, allowing purchases of 460 GL in Victoria instead of 160 GL). The extra water will come from:

- targeted buybacks in ‘less productive’ areas (to be identified by the Victorian Government in conjunction with the Northern Victoria Irrigation Renewal Project), which will be exempt from the limit
- Small Block Irrigator Exit Package related purchases being approved even where this means the limit will be exceeded.

Under the agreement, the 4 per cent limit will be maintained until 2011. From that year, the limit will be phased out, with a view to removing it by 2014 (Rudd and Brumby 2009).

Why is the limit an impediment?

When the limit is reached, any further sales of entitlements out of an area are not permitted. This means that willing sellers in these areas are prevented from selling to willing buyers outside their area. The pool of potential out-of-area sellers becomes constrained to those in areas that have not reached the limit and so entitlement prices in these areas can become higher than they would otherwise be.

In this constrained environment, the gains from trade tend to be lower and some potential buyers may withdraw from the market as prices increase. Those prevented from selling their entitlements are left worse off, although they may have the option of selling their seasonal allocation or selling their entitlement for a lower price within the area. Irrigators that are in financial difficulty, due to drought or other cause, can be disadvantaged by the limit. The Australian Bankers' Association says that the 4 per cent limit has stopped farmers from settling debts, leaving the land and investing more money (Fyffe 2009).

The 4 per cent limit impedes both the buyback and irrigator-to-irrigator trade. For the buyback, it is likely to increase the price that needs to be paid for entitlements, thereby decreasing budgetary cost effectiveness. The exemptions agreed by Victoria relax the constraints on the buyback but are selective. This means that while more entitlements can be purchased from each irrigation area than without the exemptions, these extra purchases can only occur from specified sources.

What should be done?

Some study participants have argued that the 4 per cent limit is justified because it reduces the pace of rural adjustment resulting from water trading and lessens problems associated with stranded irrigation assets. For example, the Victorian Farmers Federation (VFF) stated:

The VFF strongly supports mechanisms like the 4 per cent limit on permanent trade out of an irrigation district and termination fees, not only to ensure that rural adjustment resulting from movements of water occurs at a manageable pace, but to also guarantee that farmers not selling their water and wanting to continue farming are not faced with stranded assets and increased costs. (sub. 31, p. 3)

More recently, the VFF has argued for some exemptions to the limit to address hardship and equity issues (VFF, sub. DR78).

Others opposed the 4 per cent limit due to its impacts on those wishing to sell entitlements:

The 4 per cent rule has deprived numerous landowners the right to sell their water entitlement for the best price and to make an investment decision of their choice. (The Jackson Group, sub. 10, p. 4)

[The 4 per cent limit] is an unreasonable restriction on an irrigators' property right and is causing hardship for many irrigators who wish to sell part or all of their water but can't. Supporters might argue it maintains productive capacity in a particular region, but only if the irrigator doesn't go broke in the meantime. (National Irrigators' Council, sub. 65, p.10)

The NSW Irrigators' Council (sub. 32) suggested that the limitation on Victorian purchases had led to the buyback sourcing a high proportion of entitlements from New South Wales.

The ACCC has undertaken a thorough review of the 4 per cent limit and came to the conclusion that it should be removed, arguing:

Overall, the ACCC considers that the 4 per cent limit is a poorly targeted mechanism for dealing with concerns about the rate of structural adjustment on communities, and the risk of stranded assets. The ACCC considers that approaches that do not prevent efficient water market function and water moving to its most highly valued use should be used to manage community adjustment. (ACCC 2009c, p. 82)

The National Water Commission has also considered the arguments for and against the 4 per cent limit and has recommended its removal:

The Commission recommends the coordinated removal of all artificial barriers to trade, including the 4 per cent limit. (NWC 2009b, p. 137)

The Productivity Commission agrees that the 4 per cent limit is a poorly targeted means of addressing rural adjustment concerns and stranded assets issues and that it should be removed as soon as possible. While the limit might result in some reduction in the rate of decline of some regional economies, it does so at the expense of other regions and the broader community. The Commission's preferred approach for facilitating rural adjustment is outlined in chapter 6. The issue of stranded assets is addressed later in this chapter, as part of the discussion of termination fees.

The exemptions agreed by Victoria mean that the limit will be less of an impediment to the buyback than it would be otherwise. Among other things, they appear to enable the quantity of entitlements purchased in Victoria under the buyback to be in proportion to the share of Basin entitlements held in that state. However, the exemptions place annual restrictions on purchases from Victoria and require that a geographically targeted buyback be conducted in this state. As discussed in chapter 8, this form of targeting is likely to reduce efficiency.

The current arrangement of having a limit and exemptions can also make adjustment problems for particular regions more acute than the alternative of unrestricted trade. This is because the buyback becomes more geographically concentrated as a result of the exemptions.

New South Wales limits on sales into the buyback

The NSW Government placed an embargo on the sale of water entitlements from New South Wales for the environment (mainly affecting sales to the Commonwealth) in May 2009. This was in response to a high proportion of early purchases under the Restoring the Balance program being from New South Wales and a view that this imposed an unfair burden on the state. The embargo caused uncertainty and delay for a large number of irrigators in New South Wales whose bids to sell into the 2008-09 tenders had been accepted by the Commonwealth.

In September 2009, the embargo was lifted after an agreement was reached with the Australian Government on various matters relating to the program. This included setting a cap on Commonwealth water purchases in New South Wales of 890 GL of general security entitlement (or equivalent) over five years from the start of 2008-09, with sub-caps applying to individual years. The agreement also allows the substantial backlog of intended trades that were held up by the embargo to be approved (NSW Government and Commonwealth of Australia 2009).

This agreement constrains the potential pace of the buyback in New South Wales. It would be far preferable for decisions about the pace of the buyback to be made from a Basin-wide perspective, as originally intended.

Several study participants argued that it would be acceptable, or even preferable to remove the cap on Commonwealth water purchases in New South Wales, but only if restrictions in other jurisdictions were removed (National Irrigators' Council, sub. DR65; NSW Irrigators' Council, sub. DR72). For example, Coleambally Irrigation Co-operative Limited (CICL) stated:

CICL supports the recommendation [recommendation 10.1 below] but notes that it is Victoria that stands in the way of the 4% cap being lifted. CICL would strongly object to NSW being prevailed upon in this regard until such time as Victoria agrees to a level playing field. (sub. DR77, p. 6)

FINDING 10.1

Restrictions on water trade in Victoria and New South Wales have the potential to impair the effectiveness and efficiency of the buyback:

- *Victoria's agreement to allow some exemptions to a 4 per cent limit on out-of-area trade of water entitlements is an improvement. But because the extra purchases can only occur from specified areas, the constraints decrease the cost effectiveness of the buyback, and increase adjustment problems for some regions.*

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- *New South Wales' agreement to lift a blanket embargo on sales to the Commonwealth and replace this with annual volumetric caps is less distortionary than the Victorian restrictions, but it does limit options for conducting a faster buyback, should this be deemed necessary.*

RECOMMENDATION 10.1

The 4 per cent limit on out-of-area trade of water entitlements should be eliminated as soon as possible, rather than phased out by 2014 as currently scheduled. Limits on the amount of entitlements that can be sold to the Commonwealth through the buyback should also be eliminated.

10.2 Improving pricing

Avoiding excessive termination fees

Termination fees and exit fees are both payments from water users to irrigation infrastructure operators. They differ in that termination fees are paid when a water delivery right is surrendered, while exit fees are paid when a water entitlement is sold.

Exit fees were introduced after constraints on trade in water entitlements began to be relaxed. These fees were adopted as a means of managing the risk that irrigation assets would be stranded (left significantly underutilised) by trade, with consequent cost or viability implications for remaining irrigators. In recent years there has been a move toward using termination fees rather than exit fees. Exit fees are now no longer permitted (this was originally stipulated in schedule E of the Murray-Darling Basin Agreement).

The current situation

Termination fees are regulated and set as a multiple of the annual access fee charged by the irrigation infrastructure operator. The purpose of annual access fees is to recover fixed costs of delivering water (including fixed operating and capital costs). Some operators have argued that access fees are set low, meaning that part of the fixed costs is recovered through volumetric charges, and that maximum permissible termination fees should be set with this in mind. This has given rise to the notion of a 'shadow access fee' — the fee that would need to be charged to recover all fixed costs. Until August 2009, termination fees were permitted to be up to 15 times either the actual or the shadow annual access fee.

From 1 September 2009, termination fees have had to comply with new rules recommended by the ACCC and adopted by the Minister for Climate Change and Water (Wong 2009c). The rules cap termination fees at 10 times the annual infrastructure access fee. The rules also prohibit calculating termination fees using shadow access fees and automatically triggering termination when an irrigator sells their entitlement.

Termination fees vary considerably across the Basin, both in absolute terms and as a proportion of the market prices for the entitlements typically held by irrigators in each area (table 10.1). Data on termination fees as a percentage of entitlement price give an indication of the proportion of the revenue gained from selling entitlements that would be consumed in termination fees, in cases where the seller chooses to surrender their delivery right. In most instances this is between 8 and 15 per cent, although it is sometimes considerably higher in areas that have pumped irrigation systems (as opposed to gravity systems).

Are current termination fees excessive?

Farmers who are considering selling their entitlement and exiting irrigated agriculture will take into account the net proceeds from the sale. Where termination fees apply, net proceeds are lower than they would otherwise be. For this reason, termination fees (at any level) can prevent a trade that would have benefited the buyer and seller. The higher the fee the greater the potential for this to occur.

Termination fees generally leave both buyers and sellers (who plan to exit) worse off (that is, buyers pay more and net proceeds for sellers are lower). For government purchases for the environment this results in a reduction in budgetary cost effectiveness. Less water, and (other things being equal) less environmental benefits, can be purchased for a given level of expenditure. Differences in termination fees can also result in distortions, as explained by Murrumbidgee Irrigation:

Termination fees have not stopped trade but they have distorted purchases away from high to low termination fee areas ... (sub. 39, p. 11)

The question is whether these negative consequences of termination fees are outweighed by benefits. And, if so, what constitutes an optimal, as opposed to an excessive, termination fee?

The immediate benefits of termination fees accrue to the irrigation infrastructure operators to whom they are paid. Remaining irrigators in the area may subsequently benefit, either because this revenue enables the operator to charge lower fees, or because the irrigators are shareholders for the operator (as is generally the case in

New South Wales). Termination fees may also discourage some irrigators from terminating their delivery right. Irrigators who retain their delivery right must continue to contribute towards meeting the fixed costs of water delivery, and this can benefit irrigation infrastructure operators and remaining irrigators.

Table 10.1 Termination fees in the Murray-Darling Basin, 2009-10

	<i>Termination fee</i>	<i>Termination fee converted^a</i>	<i>Entitlement price^b</i>	<i>Termination fee as a percentage of entitlement price</i>
	\$/ML DE	\$/ML AE	\$/ML	%
Murray Irrigation (NSW)	140	140	1 297	10.8
Murrumbidgee Irrigation (NSW) ^c				
Wah Wah district	75	75	na	na
Other districts	106	106	na	na
Integrated horticultural supply	283	283	na	na
Goulburn-Murray Water (Vic)				
Shepparton	36 114	361	2 382	15.2
Central Goulburn	29 637	296	2 382	12.4
Rochester	23 458	235	2 382	9.9
Pyramid–Boort	17 973	180	2 382	7.6
Murray Valley	23 850	239	2 276	10.5
Torrumbarry	25 719	257	2 276	11.3
Lower Murray Water (Vic)				
Merbein	2 643	317	2 276	13.9
Red Cliffs	3 643	437	2 276	19.2
Robinvale	8 276	993	2 276	43.6
First Mildura: South	5 160	619	2 276	27.2
First Mildura: Other	4 300	516	2 276	22.7
Central Irrigation Trust (SA)	248	248	2 381	10.4

^a Termination fee converted to dollars per megalitre of water access entitlement held by a typical irrigator (based on the allocation of delivery entitlement that occurred when delivery rights were unbundled from access entitlements). Some irrigators will have entitlement holdings that are different to this, and so would be subject to a different termination fee (when expressed in terms of \$/ML access entitlements). ^b Based on the average price paid under the Restoring the Balance program during 2008-09. ^c Excludes small area supplies. DE: delivery entitlement. AE: access entitlement. **na** Not available.

Sources: CIT (2009); Coburn, G., Goulburn-Murray Water, pers. comm., 30 November 2009, Frontier Economics (2008); Goulburn-Murray Water (2009a); Lower Murray Water (2009); Murray Irrigation (2009); Murrumbidgee Irrigation (2009b).

Some study participants suggested that termination fees should be set to be equivalent to the negative effects on remaining irrigators that result from exits (such

as higher fixed costs for maintaining infrastructure being spread over fewer farmers). For example, the VFF contended:

... appropriate and consistent termination fees across state boundaries are vital for fair trade in water and to ensure irrigators do not suffer from rising prices when water is traded out of an area. (sub. 31, p. 13)

In the Commission's view, this is not an appropriate way to set termination fees. For one thing, operators should play their part in finding ways to reduce the need for price rises, whether this be through identifying cost savings that may become possible following exits, or attracting new irrigators to the area. More importantly, such an approach prioritises the interests of remaining irrigators ahead of those of exiting irrigators, irrigators in water importing areas and (in the case of buybacks) taxpayers, without sound justification.

The ACCC has cautioned against 'insulating remaining irrigators from price increases to an inappropriate degree' (ACCC 2008, p. xvi). It argued:

Setting the maximum termination fee multiple requires balancing the need to provide certainty for operators and irrigators to undertake efficient investments against providing price signals for operators to achieve allocative efficiency in the provision of access services (e.g. incentives for rationalisation). (ACCC 2008, p. xv)

This suggests that termination fees should be set not at a level that ensures remaining irrigators are not left worse off by exits, but at the level necessary for economic efficiency.

Termination fees may be justified on efficiency grounds in some circumstances, for example, where capital costs associated with past investment in infrastructure are being recovered through the annual access fee (and there is at least an implied contract between the operator and the irrigator). Without a termination fee an irrigator considering exiting would factor into their decision not only the price they could get for their entitlement, but also the fact that exiting would free them of their obligation to contribute towards these capital costs. This could result in an inefficient trade if the entitlement was sold to someone who valued it more than the asking price but less than the price plus the capital costs not paid.¹

It should, however, be appreciated that regulated termination fees are not the only way (or necessarily the best way) of creating an environment that is conducive to

¹ Efficient incentives could be achieved in another way without the need for termination fees. That is, by removing the requirement for irrigators to contribute toward capital costs associated with past (sunk) infrastructure investment. This is the approach advocated by Pincus (sub. DR62). The point being made is simply that if irrigators are contributing towards these costs through the access fee, a termination fee is justified on efficiency grounds.

efficient trade and investment. In a previous report, the Commission argued for the introduction of a system of supply contracts between operators and water users that specify financial and service obligations (PC 2006). Other analysts have also concluded that this approach would improve transparency and the likely efficiency of investment decisions. For example, Goesch stated:

The advantage of using long term contracts over exit fees for new investments is that irrigators will know their capital liability in advance of the investment taking place. ... the use of long term contracts effectively imposes a market test on new investments and, in doing so, increases the likelihood that these investments are only undertaken where they are economically viable. (Goesch 2001, p. 633)

Supply contracts might include termination fees; however, these could be tailored to the circumstances applying in each irrigation area and could be set in advance of new investment occurring. The existing regulatory rules for termination fees do not provide for this level of flexibility. Irrigation infrastructure operators are able to apply a termination fee of 10 times the annual access fee, even where this is above what is required on efficiency grounds. For example, a much smaller termination fee (or no termination fee at all) might be appropriate where there is no debt associated with past investment in infrastructure being recovered through the annual access fee, and no existing plans for investment in the delivery system for which current irrigators would have an implicit if not explicit obligation for.

Accordingly, the current arrangements are likely to result in termination fees being excessive in some areas. The potential for this to occur increased when the ACCC moved away from its initial position that an annual access fee multiple of eight provided a reasonable balance, to ultimately recommend a multiple of 10.

What should be done?

The new termination fee rules seem likely to go further than is warranted from an efficiency perspective in some instances. In the Commission's view, moving away from the current system of termination fees, in favour of long-term supply contracts, is an option that is worth further consideration.

That said, the new rules are a clear improvement on the previous rules. In particular, they:

- reduce barriers to water entitlement trade
- improve signals for the rationalisation of irrigation infrastructure
- ensure those selling entitlements have the option of retaining their water delivery rights.

The new rules also benefited from an extensive consultation process conducted by the ACCC. The reservations raised here do not warrant an immediate reconsideration of the rules. Rather they are matters that, in the Commission's view, should be examined when they next come up for review.

More cost-reflective water delivery pricing

Current situation

In some irrigation areas, irrigators face the same set of water delivery charges (sometimes known as 'postage stamp' pricing), despite the fact that the costs of delivery can vary considerably from irrigator to irrigator. For example, it is often much more costly to deliver water to an irrigator at the fringes of an irrigation network than to one who is next to a main channel. In this context, the costs of delivery include costs for constructing, maintaining and operating infrastructure as well as costs associated with losing water during conveyance (that is, through evaporation and leakage).

Some irrigation infrastructure operators have taken limited steps towards more cost-reflective pricing. In some cases, this is confined to increasing charges for stock and domestic customers so as to reduce or remove their cross subsidisation by irrigators. In other cases, 'postage stamp' pricing has been replaced by 'zonal' pricing. Under this system, irrigators in more costly to service zones face higher delivery charges than those in other zones, but any differences in delivery costs within the zone are not reflected in prices.

Changes underway in the Goulburn-Murray Irrigation District will achieve a more cost-reflective outcome via a different route. One aspect of the Northern Victorian Irrigation Renewal Project underway in this district is that incentives are being provided to irrigators to create new private connections to the channel system operated by Goulburn-Murray Water (Northern Victoria Irrigation Renewal Project, sub. 38). This will allow old spur channels to be decommissioned. Once built (or refurbished), the costs of maintaining the new infrastructure will be borne by the irrigators concerned and so those with longer connections will generally face higher costs.²

² Note that the incentives provided may compensate for these higher costs. The important point is that the irrigators' future decisions regarding the use and maintenance of the connection will be appropriately influenced by the associated costs.

Why is lack of cost-reflective pricing an impediment?

Postage stamp or zonal pricing can be efficient when cost differences are small or difficult to quantify. However, when this is not the case, it can lead to inefficient water use and trading decisions. Trading is affected because the incentives for irrigators to sell their water allocations or entitlements are not appropriately influenced by the true costs of delivering water to them.

The absence of cost-reflective pricing potentially makes buybacks that operate at the level of individual irrigators inefficient. For example, the relatively high system-wide cost savings that may result from the exit of irrigators at the fringes of a network will not be appropriately reflected in the prices that these irrigators would be willing to accept for their water entitlements. Similarly, irrigators who are relatively inexpensive to service, but who are paying an averaged price, will have a greater incentive to sell entitlements than is appropriate from a system-wide perspective.

The costs of this inefficiency are mainly borne by the irrigation infrastructure operator and/or the irrigators remaining in the area. The physical manifestation of the inefficiency is that the irrigators selling into the buyback are more dispersed across the area than is ideal (the ‘Swiss cheese’ problem discussed in chapter 8).

What should be done?

Postage stamp and zonal pricing can result in inefficient outcomes from water trade, whether that trade is irrigator-to-irrigator or irrigator-to-government. But the burden of this inefficiency falls mainly within the irrigation area and it is at this level that the solution of moving to more cost-reflective delivery pricing is available. There are, however, costs associated with doing this, as argued by some study participants:

... the benefits [of moving to more cost-reflective pricing] are likely to be quite small relative to the costs involved with changing pricing systems and related definition of delivery rights. Murrumbidgee Irrigation has already gone through such changes and is still wrestling with consequences and costs. The benefits would need to be very clear and very large before we would entertain such changes again. (Murrumbidgee Irrigation, sub. DR86, p. 12)

National Farmers Federation notes that cost-reflective pricing has been largely implemented (for most gravity irrigators) at an area level but not at individual irrigator level. To do so, would be extremely expensive. Therefore, the transaction costs are too high and it would be inappropriate to implement at a farm level as the gains would be lost due to its cost. (NFF, sub. DR88, pp. 22–3)

The costs and benefits of moving to more cost-reflective pricing are likely to vary across irrigation areas. Pricing at a broad zonal level may be appropriate in some areas, and a greater degree of price differentiation appropriate in others.

Some study participants argued that more cost-reflective pricing was at best only part of the solution to the ‘Swiss cheese’ issue and did not obviate the need for the buyback to be targeted (Murrumbidgee Irrigation, sub. 39; National Irrigators’ Council, sub. 24; NSW Irrigators’ Council, sub. 32).

For example, Murrumbidgee Irrigation contended:

... cost-reflective delivery prices would likely provide an incentive for particular entitlement holders to sell [but] they would likely be too small relative to the value of entitlements to overcome ‘hold out’ problems.

On balance more cost-reflective delivery prices are just part of an over-all suite of incentives and mechanisms that would be required to improve the efficiency and effectiveness of buyback and water saving projects. (sub. 39, p. 10)

The difference that cost-reflective pricing would be likely to make to the incentives for irrigators to sell entitlements is examined in box 10.1. This suggests that where differences in delivery costs across irrigators are no more than about 20 per cent, the change in incentives is likely to be reasonably small.

Box 10.1 How changes in the price of water delivery affect irrigators

Frontier Economics (2008) examined the gross margin (gross income less variable costs) of a typical long grain rice farm in the Murray region of New South Wales. While income and costs are different for different irrigated crops (and vary across irrigators growing the same crop), these data can be used to illustrate the effect that moving to more cost-reflective water delivery prices can have on irrigators.

In this case study, the delivery fees and charges account for around 19 per cent of total variable farm costs. Accordingly, where moving to cost-reflective pricing resulted in a 10 per cent increase in water delivery charges for the irrigator, this would raise total variable costs by around 2 per cent and decrease gross margin by about 8 per cent. A 40 per cent rise would increase total variable costs by around 8 per cent and decrease gross margin by about 32 per cent.

These figures tend to suggest that moderate changes in delivery charges, of the order of say 10 to 20 per cent would be likely to have only a small change in the incentives for the irrigator to sell entitlements. More substantial changes in delivery charges would, however, cause greater changes in incentives. Data from other sources indicates that this is likely to also apply for at least some other crop types (Industry and Investment NSW nd).

A given reduction in water use can be achieved through discontinuing water delivery to parts of an area, or in a geographically dispersed manner, or some combination of the two. The pattern that is most economically efficient is likely to vary across irrigation areas. Where delivery costs do not vary strongly across an area, it may be that a ‘Swiss cheese’ outcome is efficient. From the remaining irrigators’ perspective, a ‘system rationalisation’ approach will nearly always be preferred because it makes increases in delivery costs less likely. However, rationalisation may only be able to be achieved by closing down efficient irrigation businesses, and this may not be desirable from a community-wide perspective.

Moving to more cost-reflective pricing will, therefore, not necessarily prevent a geographically dispersed pattern of sales into the buyback. What it will do is create the right incentives for individual irrigators and groups of irrigators to participate, thereby making an efficient mix of ‘Swiss cheese’ and system rationalisation more likely.

It is also important to understand the influence of cost-reflective pricing in a dynamic sense. Where a group proposal to sell into the buyback is being negotiated, the prospect of changes in *future* delivery prices may have a strong influence on the individual’s incentives to participate. Consider an irrigator who can foresee that if they do not participate, they are likely to be left as the only irrigator on a spur channel. If they appreciate that a policy to implement cost-reflective pricing is in place this may substantially increase their incentive to participate. The irrigation infrastructure operator could add to these incentives by waiving termination fees and sharing some of the revenue from conveyance water savings across the group of irrigators.

As discussed in chapter 8, the Commission is not in favour of using the mechanism of targeting the buyback to avoid geographically dispersed purchases, as this would create efficiency and equity problems of its own.

Whether or not to move to more cost-reflective water delivery pricing is essentially a matter for individual operators to decide. The advantages of taking this step include that it reduces the potential for ‘Swiss cheese’ buybacks to reduce the competitiveness of irrigation areas.

FINDING 10.2

Irrigation infrastructure operators can reduce the risk that geographically-dispersed sales into the buyback will harm the competitiveness of their irrigation area by moving to more cost-reflective pricing for water delivery.

Putting a price on salinity

There are various types of salinity that occur in the Basin, including dryland and river salinity. Collectively these impose significant financial and environmental costs and pose risks for the future. These costs and risks are addressed by the Basin Salinity Management Strategy. Under this strategy, jurisdictions are responsible for managing salt discharges to the River Murray. BDA Group reported:

The Strategy is supported by a system of salinity credits and debits measured in terms of EC [electrical conductivity: a measure of salinity level] impacts at Morgan. Actions by jurisdictions that serve to reduce salinity impacts at Morgan earn credits, which can be used to offset other actions and reduce costs associated with managing the State's River Murray salinity impacts. (BDA Group 2006, p. 20)

There are various types of actions that can be taken to reduce river salinity. Some of these focus on land management, while others involve engineering works that prevent saline water entering rivers. Dilution flows can also be provided to address local concentrations in salt levels.

While some existing measures are used to manage the contribution of irrigation to river salinity (including water use approvals), irrigators do not generally face efficient incentives to manage their individual impacts on salinity. That is, irrigators who, due to their location, are responsible for adding to river salinity do not generally bear the costs associated with this.

This means that these irrigators will not generally take these costs into account in their decisions, including decisions about whether to participate in the buyback. If this situation is allowed to persist the benefits from the buyback, and from water trade generally, are likely to be lower than they could potentially be.

As discussed in chapter 8, the Commission's view is that to achieve enduring benefits this issue should be addressed not through the buyback (or through the Sustainable Rural Water Use and Infrastructure program), but through separate policy instruments designed for this purpose. This might involve:

- delineating irrigation areas into zones according to the impact that they have on salinity (as is currently done in the Sunraysia region of Victoria)
- providing financial incentives, or using water use regulations, to reduce irrigation in high-impact zones.

10.3 Addressing other direct impediments

Speeding up and simplifying the processing of trades

Chapter 8 discusses the time taken from irrigators submitting a bid to a Restoring the Balance tender through to entitlement trades being finalised. Most of the steps in this process are under the control of DEWHA and unnecessary delays with these should be addressed by the department (chapter 8). Approval and registration of trades, however, are the responsibility of state government agencies. These agencies perform these functions for all entitlement trades, whether they be irrigator-to-irrigator or irrigator-to-government.

Delays in approving trades can impose significant costs on buyers and sellers. In the case of the buyback, they can delay the watering of stressed environmental assets and seriously inconvenience sellers. The National Irrigators' Council stated:

... [our] members have consistently reported frustration with delays in processing trades and this is a matter that needs to be taken up with state governments. (sub. 24, p. 11)

While there have been some improvements in the time taken to approve entitlement trades in recent years, excessively long approval times, sometimes over 100 days, still occur (NWC 2009b). The National Water Commission reported:

... processing delays, especially for trade in water access entitlements (compared with allocation trade), continue to undermine the efficiency and effectiveness of water markets. Public reporting of performance against recently agreed COAG service standards is expected to drive significant future improvements in trade processing times, both within and between jurisdictions. (NWC 2009b, p. x)

The buyback has also suffered delays associated with trade restrictions in Victoria and New South Wales. DEWHA stated:

There have been delays in the processing of some applications, primarily as a result of state government restrictions on water trading. For instance, applications in NSW were delayed by the four month embargo on environmental water purchases. As in other years, processing of applications was delayed in Victoria as the Department had to wait for the 2009-10 ballot to see if the accumulated trade approvals would be approved within the allowable net trade under the Victorian four per cent rule. (sub. 56, p. 7)

In some cases, improvements can be achieved through agencies employing better systems or providing adequate resources. In other cases, complementary reforms such as separating (or unbundling) water delivery rights and water use approvals from water access rights are necessary to reduce the number and complexity of issues that need to be considered for approval. Also, the compatibility of the various

water registers used across the Basin needs to be improved to make interstate trade quicker and easier. As discussed in chapter 3, COAG is developing a National Water Market System that may assist with this.

Transforming commonly-held entitlements

In New South Wales and South Australia, statutory rights to water are generally held by irrigation infrastructure operators, with individual irrigators holding a right to a share of the operator's bulk entitlement. Irrigators wishing to sell their right may need to transform it into a water entitlement that can be held by someone other than the operator. The cooperation of the operator is needed to achieve transformation. This is unlike the situation in Victoria, where statutory rights are held by individual entitlement holders.

The National Water Commission reported that some operators have obstructed transformation and that this has been a significant constraint to trade (NWC 2009b). Such actions have the potential to impede the purchase of water entitlements by governments as well as irrigator-to-irrigator trade.

The ACCC has developed water market rules that aim to ensure that the policies and administrative requirements of irrigation infrastructure operators do not prevent or unreasonably delay transformation, or trade of a transformed irrigation right. These rules have been adopted by the Commonwealth Minister for Climate Change and Water and came into full effect on 1 January 2010.

In the majority of cases, the monitoring and enforcement of the new rules by the ACCC should largely remove what has been a significant restriction to water trade. There are, however, some irrigators in joint water supply schemes in New South Wales who may not be able to take advantage of transformation. The ACCC's preliminary position is that the NSW Government should review the existing arrangements for trade for these irrigators (ACCC 2009b).

Unbundling

Australia has been moving progressively from bundled to unbundled water-related rights. The first reform commenced was unbundling (separating) water entitlements from land titles. More recently, some states have begun separating water delivery rights and water use approvals from water access rights (box 10.2).

Unbundling water entitlements from land is largely complete in most jurisdictions, with Queensland being the main exception. Of most significance for the buyback,

Resource Operation Plan provisions relating to the Lower Balonne region have been deferred due to a legal challenge by Munya Lake Pty Ltd and others. Due to this deferral, there is no legal basis for the sale of water entitlements separate to land. This helps explain why no water entitlements for this area have been purchased under the Restoring the Balance program, despite the Lower Condamine–Balonne being identified as a high priority catchment for water recovery. DEWHA commented:

Purchases have not been made in ... the Lower Condamine–Balonne, because entitlements are not yet tradeable from land and in any case no value for money sell offers were received. (sub. 56, p. 8)

Box 10.2 Definition of terms

Water access right: A right to hold or take water from a water resource. Water access entitlements (referred to in this report simply as ‘water entitlements’) are one type of water access right.

Water delivery right: A right to have water delivered by an irrigation infrastructure operator.

Water use approval: Approval (or licence) to use water on a particular area of land. The environmental impact of the proposed use is the main factor taken into account in deciding whether to grant approval.

Source: NWC (2009c).

On 3 March 2010, a judgment was handed down in favour of the Department of Natural Resources and Water (*Munya Lake Pty Ltd & Ors v The Chief executive, The Department of Natural Resources and Water* [2010] QSC 58). This would appear to allow the Resource Operation Plan provisions to be implemented, thereby removing the legal impediment to sales into the buyback from the Lower Condamine–Balonne region.

Considerable progress has also been made with other types of unbundling in the Basin, but the process is incomplete. For example, water delivery rights have not been separated from water access rights for unregulated rivers in Victoria and New South Wales (NWC 2009b).

The main purpose of unbundling is to make the unbundled elements separately tradeable. The advantages of unbundling water delivery rights and water use approvals from water access rights include:

- simplified and more timely processing of water entitlement trades, as issues related to delivery and use do not need to be considered

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- allowing irrigators to sell their water entitlement while retaining the option of opportunistically irrigating using purchased seasonal allocations
 - better management of congestion in water systems (congestion is where channel capacity is not sufficient to meet unconstrained demand)
 - allowing water users to purchase only those rights that they need.

The last of these advantages is of particular relevance to government purchase of water for the environment. Unbundling allows environmental water managers to purchase water access entitlements, without having also to pay for delivery capacity that they may not need. Bundled rights, therefore, can impede water buybacks by increasing costs (PC 2006).

The main disadvantage of unbundling is the cost associated with setting up the necessary legal and institutional framework and ongoing costs associated with trading multiple types of entitlements rather than one (PC 2006). It is possible that these costs outweigh the benefits in some irrigation districts, and so unbundling of all water-related rights may not be worthwhile in all locations.

10.4 Overcoming indirect impediments

As stressed throughout this report, the benefits of the buyback and other water recovery efforts relate to the environmental improvements achieved (relative to what would have occurred otherwise) and not simply the quantity of water acquired. For this reason, it is important to consider impediments that do not directly impede the purchase of water, but which can reduce the environmental benefits obtained from the water acquired.

One of the most important indirect impediments is the lack of effective arrangements for coordination of environmental watering with other inputs, such as land management. Due to the importance of appropriate governance arrangements to overcoming this impediment, this issue is discussed in chapter 9. The other main indirect impediments are discussed below.

Improving arrangements for carrying over water

Prior to the late 1990s, holders of water entitlements backed by storage generally lost any of their allocation that they had not used or traded by the end of the irrigation year. Since then, new arrangements have been introduced in most regions to allow entitlement holders the flexibility to hold over some of their water (appropriately reduced to allow for evaporation) to the following year. Most

commonly, carryover provisions have been used, but in Queensland, capacity sharing has been preferred in some systems.

Carryover provisions allow entitlement holders to hold over a proportion of their water allocation to the next year, subject to limits that are set at the system level. These limits are used to manage third-party impacts that can arise because water that is carried over by individuals takes up storage capacity that might otherwise have been used to increase allocations for all entitlement holders. Under conventional carryover arrangements, when a storage spills (overflows) those who have carried over water have caused others to lose some water that they would otherwise have been allocated.

The National Water Commission reported:

Carryover was first introduced in the southern MDB in New South Wales in 1998-99. Carryover has been available since 2006-07 in Victoria and is now permanently available. South Australia allows carryover as an emergency drought measure, but those arrangements are not permanent.³ Currently observed rules for carryover arrangements include limits, such as for carryover volumes to be a maximum of 50 per cent of entitlement in New South Wales and Victoria. (NWC 2009b, p. 153)

The National Water Commission (2009b) also concluded that the limits on carryover may be overly conservative. That is, that they go beyond what is needed to manage third-party impacts.

In Victoria, more flexible carryover rules are to be introduced from the end of the 2009-10 irrigation season (DSE 2009). Flexibility is to be provided through the introduction of 'spillable water accounts', that allow water users to carryover water in excess of previous limits. Those who make use of these accounts will bear the risks themselves, with the water in these accounts being the first to spill when the storages overflow.

Introducing capacity sharing is a more far-reaching reform that changes the nature of water rights. As explained by Hughes:

Rather than allocating users a share of total releases, each user is allocated a share of total storage capacity, as well as a share of inflows into and losses from the storage. (Hughes 2009, p. 2)

Under this system, capacity share holders are credited with a share of inflows. Those that have carried over water may find (in a wet year) that their share fills

³ The SA Government advise that carryover was available in certain circumstances even before an administrative arrangement for carryover was introduced as an emergency drought measure (sub. DR90).

quickly and once full, they are no longer credited any inflows. Accordingly, while they have greater flexibility in carrying over water, they also bear the risks associated with this. Capacity sharing has been successfully introduced in the St George and MacIntyre regions of Queensland (Hughes 2009).⁴

Preventing water users from carrying over water, or having arrangements for this that are unnecessarily conservative, is an indirect impediment to the buyback because it reduces how flexibly environmental entitlements can be used to meet temporal variations in environmental watering needs. More flexible arrangements also offer advantages to irrigators and this has been the main motivation for the reforms undertaken to date.

The ACCC has examined the issue of carryover and recommended:

... the use of continuous accounting, capacity sharing and spillable water account[s] with no limits on carryover volumes to increase water holder's access to water across seasons. Where these are not feasible, other methods to extend access to carryover water should be pursued. (ACCC 2009b, p. 88)

The Productivity Commission endorses this recommendation. The ACCC's analysis focuses primarily on the benefits of carryover to irrigators. Given that a large quantity of entitlements are being acquired for the CEWH, the benefits of carryover to environmental water managers is also an important consideration. These are likely to be considerable, given that many sites have highly variable environmental water demands (chapter 4).

There are important issues, including third-party impacts, to be considered in developing carryover arrangements that allow individual water users greater flexibility and the opportunity to manage risks themselves. Factors such as the size and number of storages, types of water products, the mix of irrigation activities and the nature of environmental water demands may influence the approach that is most suited to each region. Accordingly, there would be value in a study that improved the understanding of these issues. Such a study has the potential to promote the wider adoption of capacity sharing and/or spillable water accounts, where appropriate. The National Water Commission, with its remit to promote sustainable management and use of Australia's water resources, would be best placed to conduct this study.

⁴ Continuous sharing is a variation on capacity sharing that also makes use of continuous accounting (a mechanism for continually assessing and reporting accounts). It has been introduced in some catchments in New South Wales (ACCC 2009b).

The National Water Commission should conduct a study into ways of expanding the ability of water users to carry over water, while adequately managing third-party impacts. This study should examine the suitability of capacity sharing, ‘spillable water accounts’ and other arrangements across different regions.

It should not be assumed, however, that entitlement holders will have greatly expanded rights for carrying over water in the future, as managing third-party impacts and the risk of spills will always be an issue. Limits on carrying over water are one reason why governments should consider purchasing other water products for the environment, such as seasonal allocations (chapter 7).

Enabling ‘shepherding’ in unregulated systems

In some unregulated systems, there is a risk that water purchased for the environment may be diverted by water users downstream, thus contributing little or no additional water for the environment. Where shepherding is a problem, there is some potential to adjust water recovery mechanisms through group purchases and across-the-board administrative changes to licence conditions. The government could also negotiate voluntary shepherding agreements (chapter 7).

Alternatively, governments could address the source of the problem — water property rights that make trade difficult. The aim would be to alter property rights so that downstream trade does not increase the volume of water that third parties are entitled to divert.

One change that could be implemented would be to alter pumping rules by setting the ‘cease to pump’ limits based on streamflow upstream of irrigators. Since any reduction in diversions by sellers would not have an impact on these upstream flows, trade in water would not have an impact on pumping opportunities for third parties. Accordingly, diversions between the seller and buyer would be unlikely to increase as a result of trade. Similarly, water purchased for the environment would not be able to be extracted by others. Another option is to allow pumping opportunities to increase, but change volumetric limits to ensure that additional water is not diverted by downstream irrigators (SKM 2009b).

There are likely to be limits to the improvements that can be made, however, especially in complex systems where irrigators can source water from multiple unregulated rivers. For example, trade might become possible within a particular zone, but third-party extraction might remain a problem where the potential buyer

(or environmental site) was further downstream. While governments should continue to investigate property right changes in unregulated systems to facilitate water trade (including environmental water buybacks) changes should only be introduced where the benefits exceed the costs. This needs to be assessed on a case-by-case basis.

Dealing with the connectivity of water systems

Due to the connectivity of water systems, the inflows to streams, rivers and dams that determine the availability of surface water depend on more than just rainfall patterns. For example, surface water availability can be reduced by:

- higher temperatures that result in more evaporation (climate change projections suggest that increased evaporation, combined with changes in rainfall patterns, is likely to be a major cause of reduced inflows in coming decades (CSIRO 2008))
- bushfires that result in mature forest being replaced by young, actively growing, forest that have higher evapotranspiration rates
- extraction of groundwater (Evans (2004) estimated that, on average in the Basin, surface water will be reduced by 60 megalitres for every 100 megalitres of groundwater extracted)
- irrigation infrastructure upgrades (on-farm and off-farm) that result in a smaller proportion of irrigation water ending up as return flows into rivers and streams
- capture of water in farm dams that reduces inflows to shared water resources
- changing land use to one that intercepts more water (for example, replacing pasture with a forest plantation) (van Dijk et al. 2006).

Apart from the first two (which are the province of other policy domains), these matters should be addressed through water policy. The aim should not be to prevent these activities from occurring, but rather to introduce property right arrangements and other policy responses that result in them being undertaken only to the extent that they produce net benefits for the community. Failure to do this tends to result in excessive levels of these activities, with consequences for both consumptive and environmental water uses. An example of this was given by the National Water Commission:

The lack of recognition of connectivity between surface water and groundwater resources is now a significant factor undermining confidence in the security of water access entitlements and water provided for the environment. An area of particular concern is the Murray-Darling Basin, where groundwater extractions have increased dramatically following the 1995 cap on surface water diversions. (NWC 2009b, p. 37)

The need to address connectivity is acknowledged in the NWI and action has been (and continues to be) taken to address this. The National Water Commission reports that all jurisdictions have made some progress in assessing the connectivity between surface water and groundwater and in developing integrated management arrangements for integrated systems, but that implementation is slow (NWC 2009b). In the longer term, it is envisaged that the Basin Plan will set sustainable diversion limits for groundwater, as well as surface water, and allow the two to be managed in conjunction with one another (MDBA 2009c).

Some policy deficiencies also remain with regard to water interception activities. For example, the National Water Commission reports that South Australia is the only jurisdiction that regulates the interception impacts of commercial forests. Horticulture Australia also argued that regulation of dams is inadequate:

... the proliferation of extra domestic and stock catchment dams should be controlled where they are outside of the controls of farm dams legislation and yet may still have an impact on water availability downstream. (sub. 36, p. 3)

In general, these deficiencies do not directly impede the conduct of the water buybacks, but they do have the potential to reduce the quantity of water that the buybacks will deliver for the environment. While not being in a position to assess the specific timeframes mentioned, the Commission endorses the substance of the following National Water Commission recommendation:

To reduce the potential for further erosion of security of existing water access entitlements, the [National Water] Commission recommends that significant and potentially significant water interception activities be immediately identified and quantified, and a process for addressing them clarified within the next six months. This will enable jurisdictions to meet their commitment to include any proposals for additional water interception activities above an agreed threshold size into existing water access entitlement regimes by no later than 2011. (NWC 2009b, p. 28)

Failure to account for connectivity is also evident in some proposals to ‘save’ water by upgrading irrigation infrastructure. That is, water is sometimes counted as saved when in reality it is simply prevented from re-entering rivers as return flows (chapter 6).