Potential water market expansion

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1.1 Background

Infrastructure Victoria is currently developing a draft 30-year infrastructure strategy covering a number of sectors including water. Infrastructure Victoria's *Draft Options Book* identifies water market expansion (WME) (p. 410) as one option for managing threats to water security particularly in regional and rural areas:

> This option considers a major expansion of the water market in Victoria to incorporate all water users at the bulk water supply level.
>
> The water market played a key role in movement of water across Northern Victoria during the millennium drought. This market enabled water trading and movement of water to highest value uses. This option considers a major expansion of the water market both geographically and with regards to representation of all water users across various sectors at the bulk water supply level. This will ensure that there is equity in the use of price signals and allow the market to determine highest value uses.
>
> Implementing this option is likely to be cost effective given potential benefits.

As part of developing the evidence base for this option, Frontier Economics was engaged by Infrastructure Victoria to prepare a research paper addressing the following questions:

- Is there scope for a major expansion of the water market in Victoria?
- Would growth of the water market assist in managing scarce water resources across the State?
- What additional requirements would the water market require to function to its potential?
- What are some likely costs and benefits?
- How might equitable distribution of water be impacted by a sophisticated and fully functioning water market?
- How might the development of new water sources such as desalinated water or recycled water impact on the water market?

2 Is there scope for a major expansion of the water market in Victoria?

Water markets are currently mature and well developed in northern Victoria, and focus on water for irrigation (although environmental managers and regional urban water businesses, and sometimes their large customers, also participate). Trading zones have also been established in the Werribee water system and in the Thomson/Macalister water system. In southern Victoria, the market is immature and the government proposes to encourage the development of the water market in the regulated surface water systems in southern Victoria (DELWP 2016).

The development of water grid infrastructure in Victoria has provided a mechanism by which regional water shortfalls can be addressed. There are two distinct mechanisms by which such water reallocations can occur:

- Administrative reallocations to redistribute water across the grid.
- Allowing trading opportunities in water markets to determine the distribution of water to address relative scarcity and relative value of demands.

In considering the potential scope for the future expansion of water markets, it is useful to consider a number of dimensions:

- geographic coverage
- the types of water that are traded
- the participants that engage in the water market.

2.1 Geographic coverage

Since water trading first commenced in Victoria in the 1980s as limits on diversions began to be imposed, the geographic scope of the water market has progressively expanded from a series of limited regional markets (e.g. Goulburn-Murray Water region) to an interconnected market covering the connected Murray-Darling Basin (MDB) in northern Victoria.

Over the last decade, the potential scope for water markets has further expended due to the significant investment in Victoria's water grid, including (DELWP 2016):

- Sugarloaf (North-South) Pipeline
- Melbourne-Geelong Pipeline
- Tarago-Warragul-Moe Pipeline
- Wimmera Mallee Interconnector

- Goldfields Superpipe (connecting Ballarat and Bendigo to the northern water system)
- Hamilton Grampians Interconnector
- modernisation of the Goulburn-Murray Irrigation District (currently underway)
- modernisation of the Sunraysia Irrigation District (currently underway).

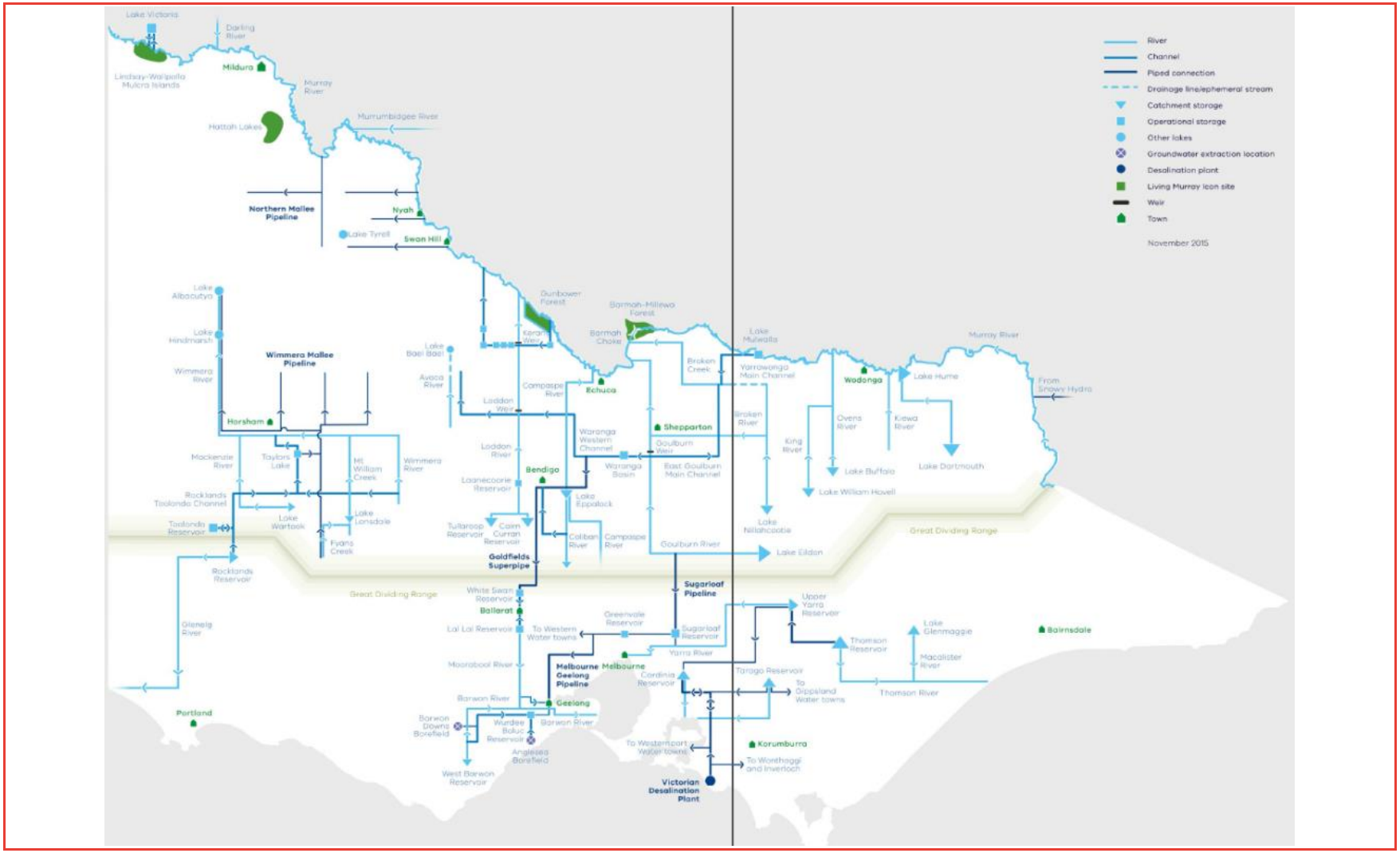
The figure below shows the current connectivity of the water supply system in Victoria. The existing water grid is predominantly supplied by rain-fed storage, now supplemented by the ability to call on the Wonthaggi desalination plant. It is also important to note that elements of the Victorian water grid interact with MDB water markets that span southern NSW and into SA.

It is important to note, however, that the way that water can be moved around the water grid is determined by characteristics of the network components. Water grid pipes are not all two-way, and natural waterways that also provide connectivity are gravity systems. Unlike transmission and distribution networks for electricity (which have minimal directional constraints), water networks need to rely on gravity flow or pumps and this means that network configurations are sometimes one-directional.

Plans have been announced for further expansion of the water grid:

- In April, the Victorian Government announced it will connect south-west Loddon Shire with Victoria's water grid (Victorian Government 2016a). Approximately 1300km of pipelines will be built to link the West Waranga Channel with the Wimmera Mallee Pipeline at an expected cost of $80 million.
- South Gippsland. $30 million of funding has been committed to provide Nyora, Loch, Korumburra and Poowong with a secure water supply by extending the water grid in South Gippsland. These four towns — currently on Stage 2 water restrictions — will be connected to Melbourne's water system for the first time (Victorian Government 2016b).

Figure 1: Victoria's water grid: A schematic



Source: DELWP 2016, Figure 9.1.

It is reasonable to anticipate further extension to the grid over the next 30 years. However, it is also important to note that there are limitations to full interconnection across the State. Water is a bulky commodity and the cost implications of pumps and pipeline requirements need to be considered.

There is also scope to expand water trading over parts of the existing water grid where active trading has to date been limited. Towards this end, for example, it is proposed to undertake a market trial in Southern Victoria (from DELWP 2016) over the next five years.

Over a 30-year period, the potential expanded scope for water markets could see active markets across urban and rural areas of southern Victoria and also the ability to trade between northern and southern Victoria through infrastructure such as the North-South Pipe — resulting in markets than can reallocate water across the whole connected Victorian water grid.

Hydrological connectivity is a necessary condition for water markets, but as discussed below, establishing water markets also requires appropriate property rights and frameworks for trading.

2.2 Types of water traded

Water markets and trade in northern Victoria is of non-potable water. The water products traded are for volumes in a given season, or long-term entitlements to a share of the water resource (with various levels of reliability). If water was moved from this system to the Melbourne system, it would have to be treated to be suitable for potable use.

Water markets in and around Melbourne that utilise the potable water grid would necessarily be for potable water. Any water market for non-potable recycled water could not involve transfer of water through the potable water network. Transfer of such recycled water requires separate infrastructure.

Transfers around the Victoria water grid could also move potable water towards irrigation uses. In such cases the value-add of water treatment is effectively lost since such water demand could be met with water that had not incurred the costs of water treatment.

It should be noted, however, that water markets do not necessarily involve the movement of a particular drop of water from one user to another. Trade in northern Victoria occurs as trade in access to water that is held behind the dam wall, so that trade can involve the substitution of sources (up to the limit of substitution possible, such as trade from Murray to Goulburn). DELWP (2016) provides the example that trade by substitution may involve the use of desalinated water in one part of the grid, thereby enabling the water in storages that would otherwise have been used there, to be sold to users in other parts of the grid.

2.3 Water market participants

Water markets can be established at different levels of disaggregation, either for trading between water suppliers, or between end customers of these businesses directly.

In northern Victoria, individual irrigators participate directly in the water market, as do regional urban water businesses. During the Millennium Drought, there were several pilot programs conducted by regional urban water businesses that enabled some large customers of these water businesses (including schools, car washes, sporting grounds and bowling clubs) to secure water in the water market and use water for purposes that was otherwise prohibited under prevailing water restrictions (Central Highlands Water 2008, 2009; Lower Murray Water 2008; North East Water 2007; RMCG 2009).

There is scope for water markets to expand further as the water grid extends to enable the connected water businesses to trade water. There is also scope for water markets to involve individual water users located within the networks of these water businesses (such as large water users, developments, and potentially even households).

Expansion of the market in Victoria to involve greater trading across rural and urban water systems involves viewing connected rural and urban water systems as a common resource and enabling various water users to compete for that resource. Under the National Water Initiative, the Australian and State and Territory Governments have agreed to facilitate water trading between the urban and rural sectors (CoAG 2004). As noted by the Productivity Commission (2008), there are a number or possible approaches to integrating rural and urban markets, including

- Limited integration — involving rural and urban water authorities only.
- Intermediate integration — including large water users, such as industry and irrigators.
- Full integration — including households or residents.

The three approaches embody varying complexity, transaction costs and administrative requirements. At each stage, there is a trade-off balancing the additional gains from trade and workability.

In our view future expansion of the water market is most likely to involve the first two of the approaches listed above. This would mean all water users are represented in the water market, if not directly involved as participants themselves.

While in theory, tradeable end user entitlements in urban systems could improve allocative efficiency by enabling water users to buy and sell entitlements according to the value they place on an additional unit of water, achieving net benefits from end user entitlements would likely be very difficult in practice. In most cases the incentive for households to participate in end user entitlements schemes would

probably be limited. Water and sewerage rates and charges, for example, generally account for a very small proportion of average weekly expenditure on goods and services (Productivity Commission 2008). Even in times of extreme scarcity, when the opportunity cost of water use is high, it is arguable that most households would prefer the administrative ease of buying water at a centrally set scarcity price to having to manage their own entitlements.

Although a large user market for water would appear more manageable than a household market, it is likely the same finding would apply. In electricity, for example, large users have the option to register and participate directly in the market. With the exception of a few very large users, however, this has not occurred. Instead, retailers manage spot market participation on behalf of their customers and enter into arrangements to deliver electricity to them on agreed terms and conditions.

Given that not all water users will have a strong incentive to directly engage in trading, it would seem sensible for someone else to act on their behalf. The urban water industry, for example, could adopt a variation of the large user market in electricity.

3 Would growth of the water market assist in managing scarce water resources across the State?

Fresh water availability in Victoria has been a significant issue in recent years. The Millennium Drought, which spanned from 1997 to 2009, saw Melbourne's water storages fall to 26 per cent of its roughly 1,800 billion litre capacity, while some storages in central and western Victoria fell to as low as 10 per cent (Victorian State of the Environment, 2013).

Between 2006 and 2010, water restrictions at various levels which limited or banned the use of water for gardening, car washing and filling of swimming pools were put in place across the state. Permanent restrictions on the use of hoses and sprinklers for gardens and for car washing were put in place in Melbourne in 2012.

Key challenges to be faced by water managers in the coming 30 years include:

- Climate change and climate variability:
  - Climate change poses a threat to the sector in the medium term. Much work on the subject has been done and is reflected in Sustainable Water Strategies and Water Supply Demand Strategies. However, with the long term impact of climate change unclear, the capacity of infrastructure outside Melbourne to deal with events such as lower average rainfall, bushfires and flood events is uncertain (DELWP 2016).
- Population growth:

- Victoria's population is forecast to grow significantly over the next 30 years. By 2051 the projected Population of Victoria is 10.1 million, comprising a projected population of 8.0 million in Greater Melbourne and 2.1 million in regional Victoria (VIF 2016).

- Increased value placed on environmental outcomes:
  - As incomes increase, society may place more value on environmental outcomes and expect river systems and other natural water system assets to be maintained to a higher level.

Water markets have demonstrated that they can be very effective tools to assist water users to manage periods of climate variability. For example:

- The NWC (2012) estimated that water trading reduced the impact of the drought on regional gross domestic product (GDP) in the southern MDB from $11.3 billion to $7 billion over the period 2006-07 and 2010-11.
- The experiences of northern Victorian regional urban water businesses were that water trading enables water to be secured for urban supplies during periods of extreme drought. Trading by water customers also mitigated the costs of water restrictions.

The growth of water markets can be particularly valuable in managing water scarcity where there are diverse water users/sources.

- The benefits of water trade observed in the southern MDB, including northern Victoria, arise from the existence of a range of water demand types (such as fixed demands from horticulture, semi-interruptible demands from dairy, and annual demand such as rice) (NWC 2010, 2012).
- Expanding the water market to additional water users further enhances trading opportunities. The benefits would be expected to mostly accrue to the newly added water users who gain the flexibility and opportunities offered by trade. The existing water market users also benefit from additional trading partners but the potential benefits are greatest when the new users provide additional diversity to the pool of water market users.

Water markets have also provided a mechanism to address concerns about the relative water use of consumptive and environmental demands. This may continue to be an issue over the 30-year horizon given that the Victorian community may place more value on the environment as their income increases. For example:

- Entitlement trading in northern Victoria and the southern MDB more broadly has been used as a vehicle for recovering water for the environment (DOE 2014)
- Water markets have also provided a means for managing environmental water portfolios, with excess water volumes able to be sold when surplus to requirement.

Would growth of the water market assist in managing scarce water resources across the State?

While experience with the operation of water markets in northern Victoria strongly supports the contention that water markets can be of major benefit in managing scarce water resources, a key issue in evaluating the WME option is whether development of an active water market in southern Victoria and across the grid will help to manage threats to water security.

In this regard it is important to note that water markets also provide mechanisms to secure water supplies for growing populations. Water markets can provide price signals to assist in optimal water supply augmentation decisions across the network to cope with increasing demands. For example, growing populations outside of Melbourne could benefit from the existing desalination investment rather than having to invest in higher cost new sources of supply. In this way, an expanded water market could ensure supply-demand balance is achieved in the least-cost way.

However, the connectivity and water access that water markets provide does not necessarily enable all water demands to be met. For example, it is unlikely for agricultural irrigation water demand to be met by desalination water sources due to the high costs associated with producing desalinated water.

4 What additional requirements would the water market require to function to its potential?

4.1 Challenges

Challenges that water market expansion will need to address include:

- Managing the decentralised decision-making and uncertainty from allowing increased water user flexibility through trade.
- Protecting third party rights to water (including environmental values). For example, if water from the desalination plant was moved via the grid from Melbourne to Geelong, it could mean water traditionally intended for Geelong went to Ballarat, with potential impacts on the Moorabool River.
- Additional reliance on water grid resources by external parties. The Victorian water grid is connected to the broader water market of the southern Murray-Darling Basin which also includes water users in New South Wales, South Australia and environmental water managers such as the Commonwealth Environmental Water Holder. Additional water demands connecting to southern MDB water resources (such as the proposed NSW pipeline to Broken Hill from Murray River) will influence water market outcomes within Victoria.

Depending on the particular market model under consideration, establishing effective market-based arrangements may require changes to the allocation of roles and responsibilities among different parties: for example, clear separation of policy making and regulatory responsibilities and commercial functions. The success of the market-based reforms in other utility sectors and of water trading in rural areas provides lessons on appropriate governance arrangements.

4.2 Required measures

Taking advantage of the opportunities to expand the scope of water markets over the next 30-year horizon will require a number of measures including:

- setting up the necessary rules for an efficient market for bulk urban water between the urban water corporations who are connected to the grid
- utilising existing connections
- refining trade rules – including management of constraints
- facilitating markets for unregulated and groundwater systems
- disaggregating decisions to end users.

DELWP (2016) note that it is crucial to have appropriate and clearly defined rules and processes governing the operation of the water market. Trading rules and processes enable water to move around the grid and facilitate new connections. Trading rules and processes include water-sharing arrangements, market rules, market settings, and operational rules on infrastructure that control how water can be traded and delivered. The appropriate mechanism for southern Victoria will be informed by the 5-year trial, which seeks to:

- better understand the current physical and regulatory constraints within southern markets
- facilitate more flexible use of existing state water assets and resources, particularly the southern grid infrastructure and potentially the desalination plant, through trade by substitution, to get the most value from surplus water and to support water management
- inform decisions on future market development.

Particular measures required for markets beyond northern Victoria and for urban water trading (e.g. in Melbourne and the connected grid) are discussed below.

Markets beyond northern Victoria

Facilitation of water markets beyond northern Victoria (and other areas of Werribee and Thomson/Macalister) will require similar reforms that enabled and encouraged water trading in these areas. For example, the establishment of

unbundled entitlements has supported a lower cost, faster and more secure trading environment.

The approach will need to be adapted in ways sensitive to the hydrological connectivity and scientific understanding of the various water resources. This may mean that, in order to appropriately manage risks, market mechanisms do not have the same scale and scope as markets in northern Victoria — the Goulburn and Murray rivers enable large volumes of a water to be reallocated over large distances. In unregulated surface water systems and groundwater systems the challenges of establishing a functional water market can be even greater than for regulated surface water. These challenges arise from the management of the environmental system and the management of risk/uncertainty.

Conversely, the built network that is rapidly expanding Victoria's water grid is not directly constrained by environmental concerns about using natural waterways for the transmission of traded water volumes. Congestion and capacity management will however be an issue.

Urban trade

Establishing water markets in urban systems will require careful design of an appropriate market model. It is important to note that there is a range of potential approaches for tradeable urban entitlements for Melbourne and for trade with connected urban centres — from limited ability to transfer water in once-off arrangements, to fully functioning markets similar to northern Victoria.

In our view, the largest potential gains are in more efficient investment and bulk sourcing decisions and longer-term management of the resource rather than in changes to the way in which water is moved around the transfer system. This is because of the significant costs that could be avoided in future major supply augmentations and in imposing restrictions on end customers. Some of the key benefits of enabling trade may be captured from decentralising key sourcing and longer-term water resource management decisions to individual entitlement holders but doing so in a way that does not also require decentralising short-term transfer decisions that are more efficiently managed through centralised management of the transfer system.

5 What are some likely benefits and costs?

5.1 Benefits

The operation of the water grid enables water users to have access to water from outside their immediate region. The benefits of having this access occur through water market arrangements (rather than via administrative reallocation) can be significant. The Victorian Government states that 'Victoria's water grid and

markets will help Victoria realise the greatest benefit from our valuable water resources' (DELWP 2016, p.118).

The benefits from utilising trades accrue via:

- Water users expressing their value for additional water volumes and the reallocation of water to its highest value use with reciprocating payment compensating water sellers for their forgone use.
- Identifying opportunities for water supply — such as from reduced water demand as water use substitutes are used, more efficient use of existing sources (such as reduced losses), and from incentivising new water supply sources (price signals for alternative sources)
- Enabling risk management (in reaction to seasonal conditions or local/regional issues)

Arguably, the largest benefits of functional water markets can arise during water shortages. If the market consists of a range of water demands and includes a range of supply options (i.e. non-correlated catchments, non-rainfall dependent such as desalination or IWCM) then the reallocation of water via trade can enable the costs of the water shortage to be significantly reduced. These trading opportunities mean that water users, be they urban water businesses or irrigators or others, do not necessarily need to maintain expensive water portfolios or infrastructure to singlehandedly manage water security.

It is difficult to estimate the magnitude of the benefits from expanding water markets. However, these benefits are expected to be large if the future seasonal conditions demonstrate significant climate variability or climate change. Further, water markets enable supply options from all the connected regions to contribute to the optimal provision of water. For example, additional modular investment in the Wonthaggi desalination plant may be an appropriate investment to address water security issues in other parts of the water grid. In this way, the full range of supply options from across the water grid and market participants can contribute to the least cost approach to meet the supply-demand balance across the network.

5.2 Costs

The largest costs of enabling water to be traded across much of Victoria have already been incurred (or will be incurred) through the capital expenditure associated with the development of the Victorian water grid.

In comparison the costs of refining governance and institutional arrangements and the development of water market rules are relatively small. There may also be requirements to add additional functionality to the Victorian Water Register and the establishment of a water grid manager in order to operationalise expanded water markets.

There are also perceived costs of water reallocation — that some users sell water and their demands are unmet (i.e. concerns about 'drying out' agriculture, such that irrigable land is used for dryland production with the value of production being significantly reduced). However, the water users themselves are best placed to make these decisions and manage these risks. As compared to administrative reallocation, water markets involved the participation of willing buyers and sellers, and sales of water received the agreed financial compensation.

6 How might equitable distribution of water be impacted by a sophisticated and fully functioning water market

Traditionally, planning processes have dictated how water has been allocated among different uses and regions.

More recently, markets have played an increasing role. Under a fully functioning water market, water will tend to be traded out of lower-valued uses and into higher-valued uses. For example, during the Millennium drought water was traded out of rice and into permanent plantings.

While patterns of water trading driven by underlying economic values can be seen (in a well-functioning market) as being economically efficient, and thereby maximising the value of scarce water resources to society, such movements in the distribution of water may not necessarily be viewed as equitable. Particular concerns have often been raised about the permanent movement of water out of struggling regions and the flow-on economic and social impacts on upstream and downstream industries and the broader community.

Such concerns have been prominent in debates about water trading since its inception. Indeed, these concerns underpinned restrictions placed on the trading of water entitlements out of irrigation districts in Victoria (such as the 4% limit). NWC (2012) found that these concerns were overstated given that water trading was not the key driver of social outcomes and trade aided resilience of many farms in the regions. Importantly, there are other instruments to deal with distributional concerns.

Trading of water to highest valued uses may also mean that urban users are willing to purchases from irrigators. This may not be a major concern for water participation by regional towns, but the larger demands of Adelaide or Melbourne could be significant. Melbourne can transfer water via the North-South Pipe (capacity 75GL/p.a.), Melbourne Water owns entitlement that could provide some/all of this but the current rules for operation of the pipe dictate that it will only be used to supply drinking water when storages are extremely low (defined as when Melbourne's total water storage levels are below 30% of capacity at 30 November of any year) (Melbourne Water 2014). Adelaide already relies on the

Murray River as a water source during drought and has historically participated in water markets (it purchased more than 100GL additional volumes during 2008-09), however the Port Stanvac desalination plant has been delivering water since 2011 and is capable of delivering 100 gigalitres (GL) per year (SA Water 2016).

Water businesses would be able to trade water to address regional demand-supply balance. Regional urban water businesses in northern Victoria have been observed to have sold water allocations into the water market (Coliban Water 2012; Goulburn Valley Water 2015). Governance arrangements related to security of supply would be needed to oversee the ability of urban water businesses to sell bulk entitlements to ensure the supply of water to end customers is not compromised.

References

Central Highlands Water 2008, _Central Highlands Water Announces Water Transmission Pilot', 23 December, Available at: http://www.chw.net.au/CHW/index.php?option=com_content&task=view&id=187&Itemid=258

Central Highlands Water 2009, _Water from Superpipe secures Ballarat jobs', 19 May, Available at: http://www.chw.net.au/CHW/index.php?option=com_content&task=view&id=208&Itemid=258

CoAG (Council of Australian Governments) 2004, Intergovernmental Agreement on a National Water Initiative, 25 June.

Coliban Water 2012, Annual Report 2011-2012, http://www.coliban.com.au/site/root/annualreport2012/files/assets/basic-html/page17.html

Deloitte 2016, Infrastructure Capability Assessment: Water and Waste, http://www.infrastructurevictoria.com.au/sites/default/files/files/160229%20-%20Water%20and%20Waste%20-%20Final.pdf

Deloitte Access 2016, Macro perspective http://www.infrastructurevictoria.com.au/sites/default/files/files/Current%20and%20Future%20State%20of%20Victoria_%20a%20macro%20perspective.pdf

DELWP 2016, Water for Victoria, Discussion Paper, http://haveyoursay.delwp.vic.gov.au/water-for-victoria/documents/32650/download

DOE (Commonwealth Department of the Environment) 2014, Water Recovery Strategy for the Murray-Darling Basin, https://www.environment.gov.au/water/publications/water-recovery-strategy-murray-darling-basin

DSE 2007, Our Water Our Future: the Next Stage of the Government's Water Plan, http://pandora.nla.gov.au/pan/105310/20090908-1450/www.ourwater.vic.gov.au/__data/assets/pdf_file/0015/366/The-Next-Stage-of-the-Governments-Water-Plan-2007.pdf

Goulburn Valley Water 2015, GVW Annual Report 2014-15, http://www.gvwater.vic.gov.au/publications/images/Goulburn_Valley_Water_2014-15_Annual_Report_(Online).pdf

Kelton, G. 2009, _Government buys up water licences', *Adelaide Advertiser*, 2 July, Available at: http://www.news.com.au/adelaidenow/story/0,,25722819-2682,00.html

Lower Murray Water 2008, _LMW announces business, schools and community group watering exemption program', Media Release, 1 January.

Melbourne Water 2014, North-South Pipeline, http://www.melbournewater.com.au/whatwedo/supply-water/north-southpipeline/pages/default.aspx

Melbourne Water 2015, Water quality, webpage accessed 9 November.

North East Water 2007, Urban water trading information pack: preserving community assets.

NWC 2010, The impacts of water trading in the southern Murray–Darling Basin: an economic, social and environmental assessment, June.

NWC 2012, Impacts of water trading in the southern Murray–Darling Basin between 2006–07 and 2010–11, April.

Productivity Commission 2008, Towards urban water reform: a discussion paper. Commission Research Paper, March 2008.

RMCG 2009, Coliban Water: review of pilot urban water trading scheme, July.

SA Water 2016, Adelaide Desalination Plant, https://www.sawater.com.au/community-and-environment/our-water-and-sewerage-systems/water-sources/desalination/adelaide-desalination-plant-adp

VFF 2016, https://www.vff.org.au/vff/Media_Centre/Latest_News/Media2016/Funding_flows_for_Victorian_water_projects.aspx

Victorian Commissioner for Environmental Sustainability 2013, Victoria: State of the Environment Report, Melbourne, October.

Victorian Government 2016a, Victoria's Water Grid To Be Expanded Across Loddon Shire, http://www.premier.vic.gov.au/victorias-water-grid-to-be-expanded-across-loddon-shire/

Victorian Government 2016b, http://www.dtf.vic.gov.au/State-Budget/2016-17-State-Budget/Budget-media-releases/A-Secure-Water-Future-For-Victoria

VIF 2016, http://www.delwp.vic.gov.au/planning/forward-policy-and-research/victoria-in-future-population-and-household-projections

Weekly Times October 14, 2015, http://www.weeklytimesnow.com.au/agribusiness/water/all-fluid-as-victorias-water-plans-aired/news-story/bfa03067671d04491b2a2296a282678d

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