

WATER REFORM IN QUEENSLAND

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1. ABSTRACT

This paper summarises the recent history of water reform in Queensland, and describes the direction of current reforms.

In 1994 the Council of Australian Governments set an agenda for water reform in Australia. In response, the Queensland Government implemented the *Water Act 2000* which has underpinned major changes to the management of water resource in Queensland. Changes include: institutional reform that separates the role of providing water services from the role of water resource allocation; catchment based water resource planning that sets limits on the allocation of water to protect environmental flows and potentially regulates the taking of overland flow; separation of water title from land title so that water can be traded separately from land; and new governance arrangements for water service providers. The new arrangements are being progressively implemented across the state.

More recently, the reform agenda has shifted to focus on urban water supply planning and management. Climate change and urbanisation, especially in South East Queensland, are challenging the SEQ urban water supply system. To provide water supply security, new water sources such as purified recycled water and desalinated water are being developed and new institutional arrangements are being established.

2. INTRODUCTION

Queensland's Water Resources

Australia is a dry island continent typified by droughts and floods. Rainfall, and consequent river flow and groundwater recharge, is extremely variable. Australia is the second driest continent after Antarctica, and has less than one per cent of the world's available freshwater resources. Some 75 per cent of Australia is semi-arid, a further 10 per cent is extremely arid and only 15 per cent of the continent is well watered.

Annual rainfall varies from less a 150 mm over parts of central Australia up to 2000 mm in the monsoonal north. However, average rainfall across most of the continent is estimated to be only 450 mm annually, with run-off only amounting to roughly 5 per cent of rainfall for 75 per cent of the land base. The rainfall variability in Australia is greater than any other continent, well above the world average and nearly twice that

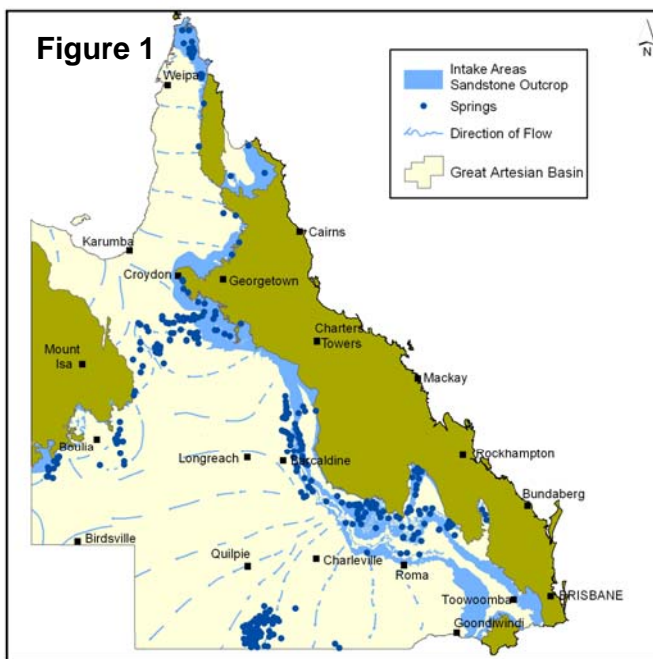
of Europe. Because of these features Australians have developed innovative approaches to water resources planning and management.

The climate in Queensland is even more variable than the rest of Australia. Different parts of the state record the highest and lowest annual rainfall levels nationwide, and three-quarters of all rainfall occurs in the less developed and sparsely populated northern catchments that drain to the Gulf of Carpentaria and the Coral Sea north of Townsville. Only about six per cent of the water in rivers drains to inland river systems.

The extreme variability and seasonality of Queensland's rainfall patterns present many unique management challenges, such as adapting modes of agricultural production to suit climate conditions and the need to rely heavily on surface water storages. Queensland has almost 200 major reservoirs, which provide approximately 64 per cent of the state's total water consumption. These have a combined capacity of approximately 10 000 gigalitres.

Queensland has extensive underground water resources. The Great Artesian Basin is the largest known artesian basin in the world, underlying some 20 per cent of continental Australia and most of Queensland. Although it stores a vast volume of water, recharge and transmission rates are small which limits the sustainable yield of the resource. However, it is a very important resource and is the only reliable water

resource in many western areas (see Figure 1).



Approximately 36 per cent of all water used in Queensland each year comes from underground water sources, mainly from alluvial deposits on the eastern margin of the state. This is significantly higher than the national average of approximately 20 per cent. In some important groundwater systems, underground water is being extracted faster than it is being replenished and some coastal systems are also experiencing saltwater intrusion due to underground water withdrawal.

Water Use in Queensland

Queensland's urban water consumption in 2004 – 2005 was approximately 340 litres/person/day. However with improved water efficiency and a significant reduction in water availability, due to drought and water restrictions, the consumption rate has reduced. In South East Queensland, domestic water consumption has reduced to 140 litres/person/day, which is a 50% reduction on pre-drought water use in the area.

3. THE 1994 COAG REFORM AGENDA

In the early 1990s the structure of the water resource management sector in Queensland and the other Australian states had remained essentially unchanged for nearly a century. It had the following characteristics:

- Entitlements to take water were tied to land. A water entitlement was an interest in land and could not be traded separately from the land.
- Decision making about entitlements to water resources was concerned with the sharing of water resources between individual water extractors, with no sound basis to consider ecological needs.
- Decision making about entitlements to water resources and development of water resources were matters of incremental decision making, where only local impacts were considered. Decision making processes did not adequately consider the cumulative impacts.
- Water infrastructure developments, and the benefits that flowed from them, tended to be seen as being in the broad public interest. As a result water charges tended to include significant unspecified subsidies.
- The development of water infrastructure, the management of the infrastructure, and the regulation of the entitlement systems were carried out by a single government agency in each state. The interests associated with these roles sometimes tended to be in conflict.

By the early 1990s stresses on the water resource management sector were seriously challenging its basic structure in the following ways:

- Water resources were so heavily developed that aquatic ecosystems were at risk of being significantly impacted.
- Because the needs for water continued to grow along with the realisation that there was a clear limit on the extent to which additional entitlements could be taken from water resources, water entitlement systems needed to be flexible allowing water to be reallocated by market processes to higher value use, providing incentives for efficiency in water use.
- Water entitlements were often not well specified with respect to security of tenure or the volume and conditions under which water could be taken.
- The mixture of roles carried out by individual state agencies was becoming of increased concern as the issues around the competition for limited water resources intensified.

In 1994 the Council of Australian Governments (COAG) agreed on an agenda for water reform: The key elements were:

- The development of catchment based water resource plans that established the share of the water resource to be preserved to sustain ecological needs, and the share to be available for allocation under water access entitlements for consumptive use.
- The separation of water access entitlements from land so that they could be traded separately from land.
- The clear specification of water access entitlements to provide certainty about protection of ecosystems, certainty for water users and clear information for the water market.
- Cost reflective water pricing with any subsidy of costs made transparent.

4. THE WATER ACT 2000

Queensland delivered the framework for reform in the Queensland *Water Act 2000*. The water entitlement and water planning provisions of that legislation deliver the core elements of the reform, and remain a benchmark system.

The planning provisions provide for the development of water resource plans and resource operations plans. Water resource plans identify the environmental values to be protected in a catchment, and the environmental flows that are needed to support those values. Those plans also specify the expected reliability of the environmental flows and water access entitlements to take water from the system, as well as the volume of any additional entitlements that could be granted or any reductions that need to occur.

Resource operations plans are developed after the water resources plans are finalised. On the basis of best available knowledge, they provide the rules which, if followed, will result in the reliability specifications for the environmental flows and water user's entitlements being achieved. The rules include rules for the operation of infrastructure, rules for the relocation of points of water extraction as part of water trades, and rules about water sharing such as the extent to which unused water available under a water entitlement can be carried over for use in the subsequent year.

The *Water Act 2000* established the Queensland water allocation register, which was the first 'Torrens-like' register for water access entitlements in Australia. The register is very similar in structure and operation to the Queensland land title register, which is itself a benchmark system. Although registered water access entitlements can be dealt with separately to land, it is also very easy to deal with land and water together. For example, if a farm is sold, the land and the water entitlement can be entered on a single transfer document for lodgement at the registry.

At the time the *Water Act 2000* was commenced institutional reform was also carried out. The part of the agency that operated water infrastructure was established as a government owned corporation called SunWater. SunWater owns the water infrastructure and provides the service of storing and delivering water. SunWater customers have a contract for the storage and delivery service, and they hold tradable water access entitlements from the state for the right to the water.

Implementation of the Water Act 2000

The *Water Act 2000* is being implemented progressively. Water planning is carried out in catchments on a priority basis. To date water resource plans have been finalised for 20 of 23 scheduled plan areas, covering 91% of Queensland's land mass. Resource operations plans have been finalised for 10 scheduled plan areas, covering 51% of Queensland's land resources. In addition, a water resource plan and a resource operations plan have been prepared for the Great Artesian Basin that underlies much of western Queensland.

The resource operations plans provide for the conversion of priority existing water entitlements into tradable water access entitlements. On approval of a resource operations plan the new tradable water access entitlements are loaded onto the water allocation register and can be traded in accordance with the rules specified in the plan. After initial priorities are addressed in the first generation of plans, the plans are amended, again according to priorities, to establish tradable water access entitlements to replace other water entitlement in the catchment, such as those for access to minor tributary streams and groundwater. For example, in 2008 an amendment to the Pioneer catchment resource operations plan was in progress to establish water access entitlements for the Pioneer groundwater system. The amendments provide sophisticated rules for the dynamic management of surface water groundwater interconnectivity.

To March 2008 more than 8000 tradable water allocations have been established in Queensland with a total volume of 1 400 gigalitres and a total value of some \$2B. Additional water allocations will be created as additional plans are finalised or amended. From the commencement of permanent trade in July 2003 to January 2008, more than 900 permanent trades totalling some 80 gigalitres have been carried out. These figures do not include trades where water access entitlements were sold with land as a going concern. Rather, they reflect water users making adjustments to their water needs as a result of water efficiencies achieved or to support changes in their businesses. Most of the trade has been in the Fitzroy and Burnett catchments where the price is typically \$2000 and \$1000 per megalitre respectively. Trading reports, along with information about the trading rules, are published on the department's website at the following address:
http://www.nrw.qld.gov.au/water/trading/market_info.html.

5. SUBSEQUENT NATIONAL REFORMS

National Water Initiative

In 2004 the COAG refreshed the national water reform agenda by adopting the National Water Initiative (NWI). This plan of action is a more focussed expression of the 1994 reform agenda, but adds some new elements.

The NWI provides more specific criteria for water resource planning processes and entitlement and registration systems. Queensland, already on the vanguard of water reform in the planning and entitlement arena, was at the time already implementing a planning and entitlement system that met the new national criteria.

The parties to the NWI also agreed that interception needed to be monitored, and be managed where necessary. All manner of human activities affect the movement of water through the water cycle, but some of these activities have the potential to significantly affect outcomes in water resource planning by 'intercepting' water before it enters the regulated part of the water cycle. Examples are the construction farm dams, bores and forests. The parties agreed to monitor the risk of changes in unconstrained activities and take appropriate measures if necessary, including regulatory measures, to protect water access entitlements and ecosystems. In Queensland the water entitlement system under the *Water Act 2000* had already established the power to regulate farm dams, and in sensitive catchments water resource plans used these powers to prevent the construction of new farm dams for other than stock and domestic purposes. Queensland also monitors trends in the use of groundwater in areas where that activity is not regulated, and, where necessary, introduces regulation through the water resource planning process.

The NWI was driven in part by growing concern about over-allocation. Over-allocation is a level of allocation beyond a sustainable level. The sustainable level of allocation of a water resource is not an intrinsic attribute of a water resource that is discoverable through science. Rather it is the level of allocation that is decided by the government responsible for the allocation of water resources as it seeks to balance economic, environmental and social objectives. Although a basin wide plan is not in place for the cross-jurisdictional Murray Darling Basin, there had been a growing consensus that the basin was over-allocated and that action was urgently needed. The NWI addresses the prospect that water resource planning processes will need to deal with reductions in the level of allocation by providing a principle framework for the assignment of risk associated with such reductions. The NWI also set targets for

the removal of barriers to both intra and inter-state trade in the southern Murray Darling Basin, to maximise the opportunities for the re-allocation of scarce water resources.

A new element introduced by the NWI is water accounting. In response to the need to manage water resource more closely the NWI set an agenda for developing a more formal and standardised approach to water accounting. Queensland embraces the development of water accounting as an essential part of evolving management systems. Queensland is a partner in the development national structures and standards in response to the NWI, and is leading a pilot study to test the extent to which financial accounting principles can be usefully applied in water accounting at a catchment scale.

The NWI introduced urban water supply issues to the national water reform agenda. It focussed on the need for demand management measures and the promotion of water sensitive urban design measures. Urban water reform in Queensland has moved well beyond the agenda set in the NWI as discussed in a later section.

The Commonwealth Water Act

The Commonwealth Water Act was passed in 2007. Key elements are the establishment of a Murray Darling Basin Authority with a key role of developing a water resource plan for the basin as a whole. It creates an obligation for the basin states to carry out planning for the catchments of the basin within their states in a way that is consistent with the whole of basin plan, and a role for the Murray Darling Basin Authority in advising the Commonwealth minister on that consistency. It also promotes the development of water accounting by widening the role of the Bureau of Meteorology in relation to the collection of water information.

The implementation of the Commonwealth Water Act is only now commencing and there is much yet to be negotiated. Nevertheless, the concept of a basin wide plan is consistent with the approach to planning implemented in Queensland, and is supported by the state.

6. REGIONAL AND URBAN PLANNING

Identifying the environmental share and the consumptive share through the water resource planning processes is the foundation step in securing reliable water supplies for water users. Individual water users are able to use the security and flexibility of the new water access entitlements to make sound business decisions. At a broader scale, regional and urban communities are also then able to confidently plan for the future. Queensland initiatives in these areas are discussed in the following sections.

Developing Regional Water Supply Strategies

Water resource plans inform regional communities about the water access entitlements available, the potential for the grant of additional entitlements, and the potential locations from which water can be extracted through relocation of entitlements under trading regimes. With this information regional communities are able to plan for regional water needs. For example, water resource plans make it possible to assess the extent to which water trading can meet future water needs by relocating water access entitlements from one area to another, and the extent to

which pipelines are needed to transport water physically to the places where it is needed.

In 2003, regional communities built on this emerging platform of water resource plans and developed a secondary level of planning known as 'regional water supply strategies'. These strategies provide a long term whole-of-basin plan for managing the region's water resources, to meet the future urban, industrial, mining and agricultural water needs. Other than in South East Queensland, which is discussed in the next section, regional water supply planning is carried out in a non-statutory framework.

Regional water supply strategies have been completed, or are under development, for six major urban, industrial or rural growth areas. Strategies cover South East Queensland, Far North Queensland, North Queensland, Mackay Whitsunday, Central Queensland and the Wide Bay Burnett. The Central Queensland strategy is at implementation stage, and the draft Far North Queensland strategy was released in September 2007.

As a result of the Central Queensland regional water supply strategy, water supply infrastructure projects under construction or in pre-development planning are as follows:

- Main Burdekin-Moranbah pipeline was completed in August 2007
- Rockhampton-Yeppoon pipeline is due for completion in 2009
- Proponent for the Rockhampton-Gladstone pipeline (Gladstone Area Water Board) was announced in July 2007
- Pre-feasibility studies for the Connors River Dam, Nathan Dam, Rookwood Weir and Raising of Eden Bann Weir are currently in progress.

Urban Water Supply in South East Queensland

Planning

The provision of urban water supply in Queensland has been challenged in recent years by a combination of factors, particularly in South East Queensland (SEQ). These factors are as follows:

- *Increased water needs.* SEQ is the fastest growing area of Australia. As a result water needs will grow even with improved water efficiency.
- *Additional traditional water sources are less available and more expensive.* With a greater density of people and more intense use of land, new water sources that are able to be developed under the provisions of water resource plans are increasingly remote from the urban centre of SEQ. They will be increasingly expensive to develop.
- *Growth is challenging institutional arrangements.* As the SEQ region grows, it is becoming increasingly more efficient to interconnect previously discrete local government water supply systems.
- *Drought.* The current severe drought has focussed attention on the need to plan for a capacity to meet essential needs in an environment of more frequent severe droughts expected to result from climate change.

In recognition of these issues the Queensland Government established the Queensland Water Commission (QWC) in May 2006. The QWC is a statutory authority constituted under new provisions added to the Queensland *Water Act 2000*. The QWC's role is to advise the government concerning a 'regional water supply security program' for SEQ. On approval of a regional water supply security program

by the government, the QWC's role is to facilitate its implementation. The jurisdiction of the QWC can be extended beyond SEQ.

In November 2006 the Queensland Government adopted a regional water supply security program for SEQ within the *Water Regulation (2002)*. The regulation sets out a program of works including a new dam, a desalination plant, a purified recycled water scheme, and new inter-connector pipelines. Construction of the works is in progress.

The *South East Queensland Water (Restructuring) Act* provides for the transfer of bulk water infrastructure from existing owners, primarily local governments, to one of three new water infrastructure entities. All dam infrastructure in SEQ will be transferred to the Queensland Bulk Water Supply Authority. The Queensland Bulk Management Authority will own the purified recycled water infrastructure as well as the desalination plant. The Queensland Bulk Water Transport Authority will own the new inter-connector pipelines. A Water Grid Manager (WGM) will own all of the water access entitlements for urban supply from the dams. The WGM will purchase services from the above entities and be the sole provider of water supply services to urban retailers in the SEQ region.

The QWC is currently finalising a regional water supply strategy that will set out how the WGM will use the portfolio of natural and manufactured water sources to deliver the planned level of service.

Demand Management

In order to address the prolonged drought in SEQ, a regional demand management program has been implemented. A central feature of this program is improved community education through the 'Target 140 litres/person/day' program. This program has been successful in reducing water use to the target level during the current drought.

In addition the Queensland Government is actively promoting water conservation measures through the delivery of incentive and education based programs, including: the WaterWise education program, the Home and Garden WaterWise Rebate Scheme, the Home Water Wise Service, the Business Water Efficiency Program, the EcoBiz program, the Climate Smart Living Education Program, and the Rural Water Use Efficiency Initiative.

Through amendments to legislation in November 2007 new urban water demand management measures are being introduced, both in South East Queensland and progressively across the state. Key changes are:

- sub metering of all new multi unit dwellings with the owners of each unit charged directly for water use;
- providing residential tenants with water use information if their dwelling is individually metered, and providing the power for a landlord to arrange in tenancy agreements for water charges to be passed on to the tenant;
- improving water billing to provide consistent water use information and billing periods across all regions of the state;
- requirements to fit water efficiency devices in residential premises during major renovations; and
- extension of regulated greywater use to include washing cars and flushing toilets.

More information on demand management initiatives can be found on the following websites:

http://www.nrw.qld.gov.au/compliance/wic/water_supply_leg.html;

<http://www.qwc.qld.gov.au/demand+management>.

7. REFORM ISSUES FOR THE FUTURE

Queensland does not share all of the drivers for reform that operate in other states. While the states of the Southern Murray Darling Basin may see the advantage in having a national water access entitlement register, such a register would provide little benefit to Queensland stakeholders. Also, Queensland's irrigation infrastructure is generally more modern than in other parts of Australia with the result that system efficiency and metering are of less concern. Furthermore, over-allocation is not as large an issue in Queensland as in the Southern Murray Darling Basin. The key areas for the future of water reform in Queensland are:

- Ensuring that water planning of all forms makes appropriate provision for climate change;
- Integrating new Commonwealth planning responsibilities with existing state water resource planning responsibilities;
- Implementing water charges for water resource planning and management in accord with national policy;
- Planning for, and delivering, agreed levels of service for urban water supplies, as well as implementing appropriate service charges; and
- Developing regulatory systems to ensure the quality of manufactured water sources.

8. REFERENCES

Note: This paper has been compiled from statutes and various papers, publications and presentations prepared by officials with the Department of Natural Resources and Water.