Australian Government

MURRAY–DARLING BASIN AUTHORITY

Submission to the Senate Select Committee

Multi-Jurisdictional Management and Execution of the Murray–Darling Basin Plan

September 2019

Published by the Murray–Darling Basin Authority
MDBA publication no: 0
ISBN (online): ISBN generated by communications
ISBN (print): ISBN generated by communications

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Cataloguing data
Title: Submission to the Senate Select Committee, Murray–Darling Basin Authority Canberra, 2019. CC BY 4.0

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Acknowledgement of the Traditional Owners of the Murray–Darling Basin
The Murray−Darling Basin Authority pays respect to the Traditional Owners and their Nations of the Murray−Darling Basin. We acknowledge their deep cultural, social, environmental, spiritual and economic connection to their lands and waters.

The guidance and support received from the Murray Lower Darling Rivers Indigenous Nations, the Northern Basin Aboriginal Nations and our many Traditional Owner friends and colleagues is very much valued and appreciated.

Aboriginal people should be aware that this publication may contain images, names or quotations of deceased persons.

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Introduction

The Murray–Darling Basin Authority welcomes the opportunity to make a submission to the Select Committee on the Multi-jurisdictional Management and Execution of the Murray–Darling Basin Plan. The Authority's submission is focused on describing current water management arrangements, the history of water reform, and the interdependencies of water management across Commonwealth, state and territory governments.

Throughout Australia's history, water has been the most contested natural resource. If the water of the Murray–Darling Basin is to be shared fairly between all users now and into the future, the way water is used across the Basin needs to change. For over one hundred years, the River Murray has been jointly managed by Basin states through the Murray–Darling Agreement. The Basin Plan is a major reform agenda to improve the health and operations of the Murray–Darling Basin's rivers, building on a long history of water reform in the Murray system. A sustainable working Basin will ultimately benefit all Australians.

There are many elements of the reform that have been successfully delivered and are improving water management and river health. Entitlements for water for the environment have been created and limits on consumptive uses have been put in place. Water is traded to its highest value use through water markets and water quality has improved in many parts of the Basin. These measures demonstrate what can be achieved by cooperation between governments, and are improving the health and operation of the Basin. While we have come a long way, there is still a long way to go before Australians can say that we have a healthy, working Basin where the rivers, and all users and uses have a secure future.

The Basin Plan is a legal commitment, made under Commonwealth law. Its implementation, however, is complex, requiring cooperation and commitment from six governments—four states, one territory, and the Commonwealth. This means decisions need agreement through multiple layers of government.

Successful implementation will be achieved through clear agreement between all parties, successful partnerships in the delivery of projects, ongoing monitoring, and publicly transparent assessments of progress and outcomes. There are opportunities to:

- **Streamline governance and decision-making arrangements**: Critical decisions for Basin Plan implementation require commitment and collaboration in challenging interjurisdictional forums. It is essential that decision-making in these forums is constructive and consciously works towards Basin Plan deadlines and targets. An independent review of Basin water governance arrangements was recently conducted and the MDBA is exploring options to implement recommendations that optimise the likelihood of water reform outcomes being more effectively and efficiently achieved.
- **Improve transparency of information and data**: Information is a critical currency for trust, and the MDBA is working towards improving public access to information and data. This includes improving data-sharing arrangements with jurisdictions so that the MDBA can publish data regularly. Building a rigorous and trusted compliance regime and exploring

opportunities for stakeholders to better understand the complex water accounting system are also key focuses for the MDBA, as noted in the MDBA's recent Trade Price Audit Report.

- **Water markets and trade**: There are also significant opportunities to improve reporting and publication of water trade information within and between jurisdictions. This this will be a key focus of the recently announced review of water markets by the ACCC.
- **Improve coordination between governments**: The Basin Plan's primary objective and challenge is to manage Basin water resources as a connected system. Consistent coordination and collective leadership are required to complete remaining Basin Plan commitments and respond to new challenges in water reform. Aligning state and Commonwealth water management arrangements through water resource plans is one mechanism that will enable us to better respond to changes in the Basin's variable climate.
- **Aboriginal involvement in decision-making**: There are a number of current initiatives to deepen Aboriginal involvement in water management and it is important to ensure these initiatives are well designed, adequately funded and culturally appropriate to attain real cultural, environmental and economic outcomes for Aboriginal people in the Basin (e.g. Aboriginal Water Entitlement Program). It should be noted that Basin governments have committed to appoint an Indigenous member to the Murray–Darling Basin Authority.

Changes will need to be agreed through all governments, given the multi-jurisdictional nature of water reform. The Murray–Darling Basin Authority is happy to discuss these opportunities in more detail with the Committee.

Water governance in the Basin

The Murray–Darling Basin (the Basin) is the largest river system in Australia. Managing its water resources is complex. It is underpinned by a partnership between the Australian Government, New South Wales (NSW), Queensland, South Australia, Victoria and the Australian Capital Territory (ACT).

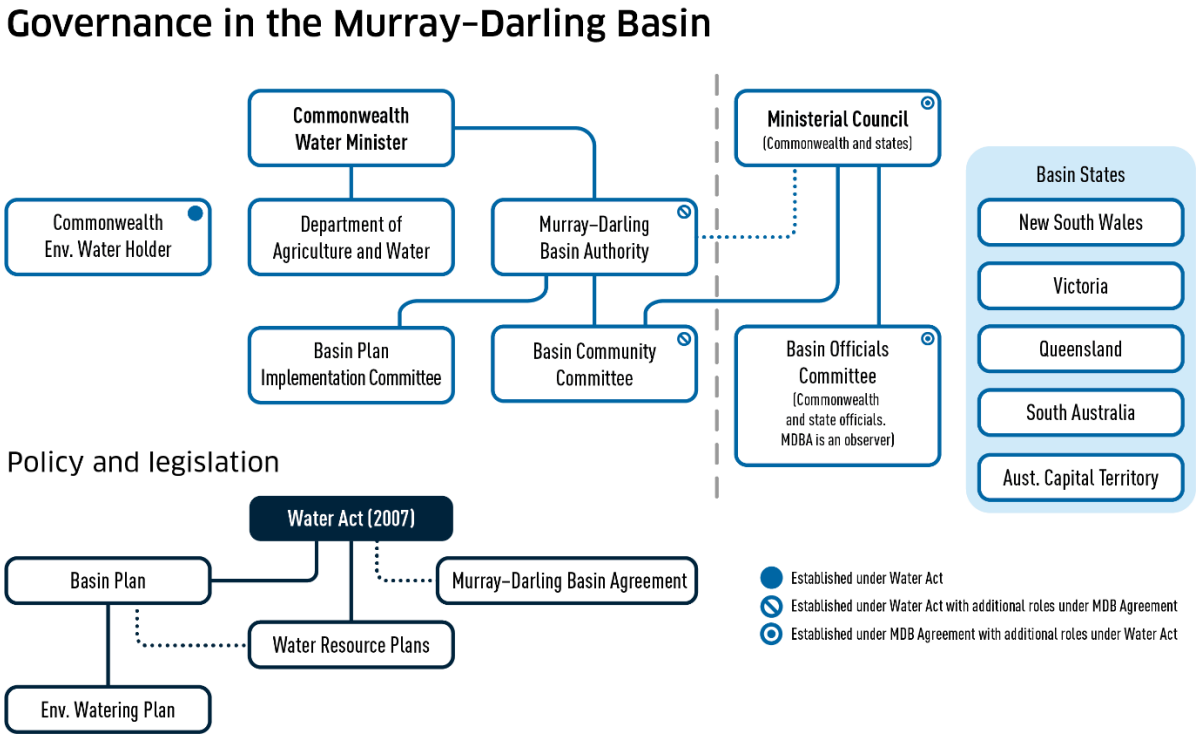


Figure 1: Governance in the Murray–Darling Basin

There are three layers of regulatory responsibility in the Basin:

- State /Territory legislation
- Intergovernmental agreements
- Commonwealth legislation

These governance arrangements are recognized world-wide as a successful example of integrated river basin management (Appendix A, B & C).

State and Territory legislation

Under the Constitution, each State maintains authority for its water resources. Each Basin state and the ACT are responsible for managing water in their own areas and have their own frameworks to do so, including water resource management legislation, water entitlement and licensing regimes, and regulatory and compliance frameworks.

In the Basin, states and the ACT must ensure their own legislative arrangements are consistent with Commonwealth legislation.

The MDBA notes the Committee's terms of reference extend to matters which touch on constitutional law and the Commonwealth/State arrangements which underpin development of the Water Act and the Basin Plan. The MDBA recognises that the Department of Agriculture[1] has principal responsibility for this legislation and notes the role of the Department of Environment and Energy in relation to Part 6 of the Act, consistent with the Administrative Arrangements Orders.

The MDBA understand that the Department's submission to the Committee will address these matters.

Intergovernmental agreements

The Murray–Darling Basin Agreement

In 1914 NSW, Victoria and South Australia developed the first agreement which set out how the available water resources of the River Murray would be shared. A key feature of this agreement was the need for any amendments to be passed through the Parliaments of all signatory governments. An independent body, the River Murray Commission, was formed in 1917. Over 100 years later, its successor body, the Murray–Darling Basin Authority (MDBA), continues to fulfil this function as an independent statutory authority managing the water resources of the Basin.

The Murray–Darling Basin Agreement (the Agreement) sets out roles and responsibilities with respect to River operations. Its purpose is to promote and co-ordinate effective planning and sustainable use of the water and other natural resources of the Basin. The Agreement is set out in Schedule 1 of the Water Act and establishes the joint venture between the Australian Government, New South Wales, Victoria, South Australia, Queensland and the Australian Capital Territory. The Agreement can be amended with approval of the Murray–Darling Basin Ministerial Council.

The National Water Initiative

The National Water Initiative is the blueprint for water reform across Australia. It was signed by the Council of Australian Governments in 2004 and is an agreement between the Australian Government and all states and territories.

It is considered a key milestone for water management in Australia, providing direction on how to use our most precious resource, and in particular recognising the need to manage surface water and groundwater as a connected system.

Under the Initiative, governments have committed to:

- Preparing comprehensive water plans
- Achieving sustainable water use in over-allocated or stressed water systems
- Introducing registers of water rights and standards for water accounting
- Expanding trade in water rights

[1] Current at 23 September 2019, noting that Murray–Darling Basin water management will move to the Department of infrastructure, Transport, Cities and Regional Development by the end of 2019.

- Improving pricing for water storage and delivery
- Better managing urban water demands.

Commonwealth legislation

The Commonwealth legislation that governs the management of water resources in the Basin consists of the Water Act and the Basin Plan. These pieces of legislation provide a framework which:

- Sets water management objectives for the whole Basin
- Reflects the importance of consulting widely and appropriately
- Supports well-informed, expert judgements about key management settings from a whole of Basin perspective
- Puts in place arrangements for monitoring, review and adaptation of those settings in future.

This framework considers the water resources in the Basin as a whole, rather than only those in the southern River Murray System.

The Water Act 2007

The Water Act 2007 provides the legislative framework for ensuring that Australia's largest water resource—the Murray–Darling Basin—is managed as a single system in the national interest. In doing so the Water Act recognises that Australian states in the Basin continue to manage Basin water resources within their jurisdictions.

The Water Act:

- established the Murray–Darling Basin Authority (MDBA)
- required the MDBA to prepare the Basin Plan
- established the Commonwealth Environmental Water Holder to manage the Commonwealth's environmental water to protect and restore the environmental assets of the Basin
- provided the Australian Competition and Consumer Commission (ACCC) with a key role in developing and enforcing water charge and water market rules along the lines agreed in the National Water Initiative.
- gave the Bureau of Meteorology additional water information functions
- gave the Productivity Commission a role in reporting on the effectiveness of water reform legislation.

The *Water Act 2007* (Water Act) commenced on 3 September 2007, giving effect to the Government's National Plan for Water Security. This Plan provided an initial $10.05 billion for modernising Australia's irrigation infrastructure, addressing over-allocation of water in the Basin, reforming management of the Basin, and investing in water information.

The Basin Plan

In 2012, there was widespread agreement across government that a plan was needed to manage Basin water resources carefully and protect the Basin for future generations. The Basin Plan was adopted as a legislative instrument in November 2012 and provides for the integrated management of the water resources in the Basin, aiming to bring the Basin back to a healthier and sustainable level while continuing to support farming and other industries for the benefit of the Australian community. The Basin Plan does not aim to return the Basin to pre-development conditions, nor does it aim to drought-proof the Basin. Rather, it aims to share available water equitably between all users, including the environment, in the Basin's variable climatic conditions.

At its heart, the Basin Plan sets the amount of water that can be taken each year for consumptive use, while leaving enough for rivers, lakes and wetlands. This amount is called the Sustainable Diversion Limit (SDL). This limit builds on the 1995 cap on water diversions, which limited surface water take across most catchments in the Basin. The SDL is based on the improved knowledge base built since the Cap, including a better understanding of the system and environmental water needs. Unlike the Cap, the SDL allows interconnected water resources to be managed across catchments and states, and importantly includes limits on groundwater take in the Basin for the first time. Figure 2 outlines the major elements of the Basin Plan.

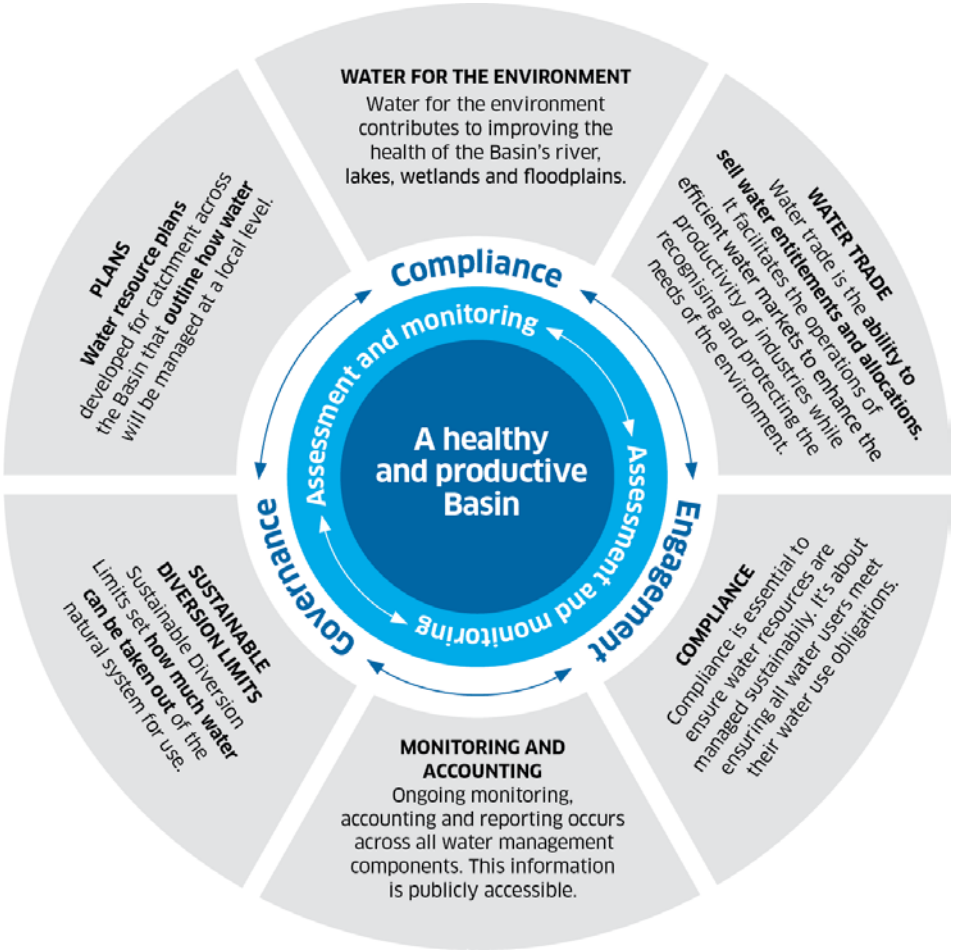


Figure 2: Major elements of the Basin Plan

The Basin Plan is now over halfway to full implementation, which will be complete in 2024. Much has been achieved since 2012, such as building a reliable knowledge base on the northern Basin and groundwater systems, determining the volume of the sustainable diversion limit adjustment mechanism, and giving effect to the Sustainable Diversion Limits (SDLs). But there are still significant milestones yet to be achieved.

A key element of the Basin Plan for the Basin states and the ACT is to develop water resource plans, and for the Commonwealth Minister to accredit these plans. The plans will cover a range of water management issues and are described in more detail, along with other significant water reform milestones, in the Basin Plan implementation section of this submission.

The Murray–Darling Basin Authority

The Water Act established the MDBA as the primary agency responsible for coordinating how the Basin's water resources are managed. The two key functions of the MDBA are:

- Operating the River Murray system, on behalf of the Basin governments in accordance with the Murray–Darling Basin Agreement.
- Overseeing implementation of the Basin Plan.

The first function, to operate the River Murray and joint programs, is guided by collective Basin governments and is jointly funded by the Commonwealth and Basin jurisdictions. The second function, to oversee the rollout of the Basin Plan, requires the Authority to make decisions and recommendations and is funded by the Commonwealth. The MDBA's roles in river operations and Basin Plan implementation, along with those of other jurisdictions, are outlined in following sections.

For Basin Plan matters, the MDBA is accountable to the Commonwealth Minister responsible for Water. The Minister may direct the MDBA about the performance of its functions in certain respects and has an important role in key processes, including the making or amendment of the Basin Plan and in accrediting water resource plans.

For matters under the Agreement, the MDBA is accountable to the Murray–Darling Basin Ministerial Council (Ministerial Council). The Ministerial Council is comprised of a Minister from each of the Basin State governments and is chaired by the Commonwealth Minister responsible for Water. The current Ministerial Council members are[2]:

- Commonwealth Minister: The Hon. David Littleproud MP, Minister for Resources, Drought, Rural Finance, Natural Disaster and Emergency Management.
- New South Wales: The Hon. Melinda Pavey MP, Minister for Water, Property and Housing
- Victoria: The Hon. Lisa Neville MP, Minister for Water
- South Australia: The Hon. David Speirs, Minister for Environment and Water
- ACT: Mr Mick Gentleman MLA, Minister for the Environment and Heritage

[2] Current at 23 September 2019.

- Queensland: The Hon. Dr Anthony Lynham MP, Minister for Natural Resources, Mines and Energy

The Ministerial Council has the power to set objectives and outcomes for the MDBA in relation to certain matters and there are a number of MDBA functions that require the approval of the Ministerial Council. The governance arrangements of the MDBA and core functions of each committee are summarised in Figure 3.

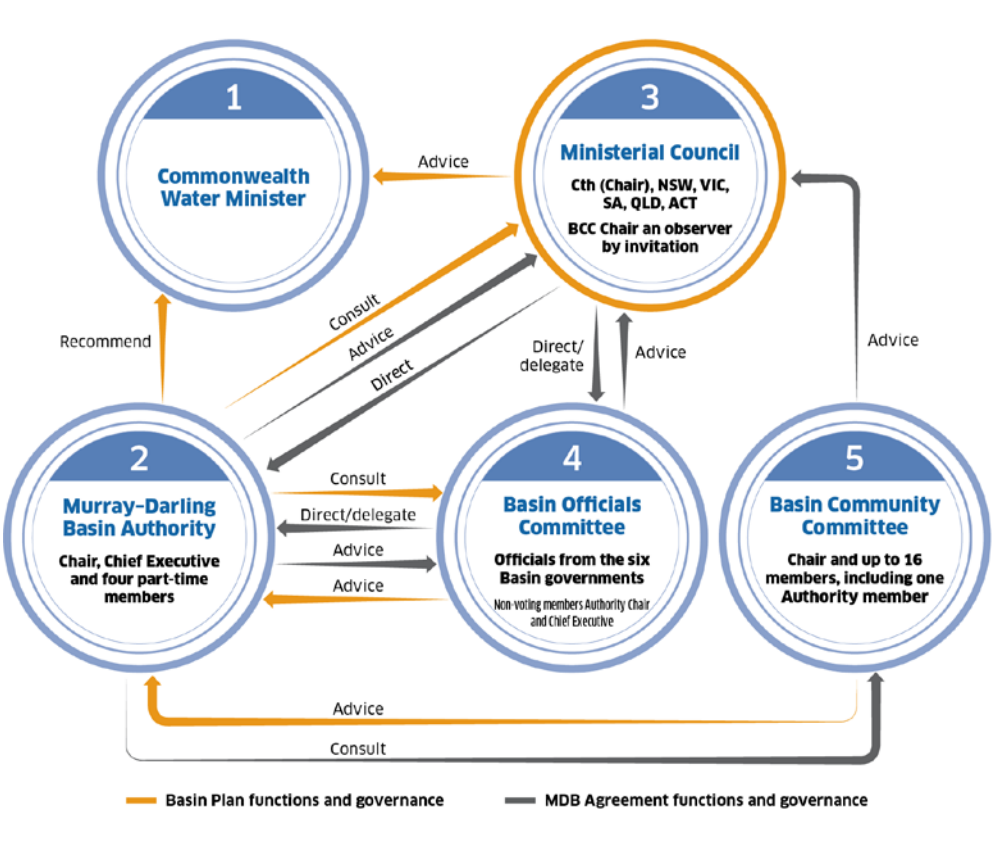


Figure 3: Governance arrangements of the Murray–Darling Basin Authority

River Murray management

The River Murray System

The water of the River Murray has been shared by New South Wales, Victoria, and South Australia for more than 100 years. Historically, major dams were built to provide reliable water supply for towns and irrigation, while weirs and locks were built to facilitate navigation of the river. Today these weirs and locks support important tourism and recreation activities, with many weir pools also facilitating pumping for extractive uses and environmental watering. Other assets, such as salt interception schemes and barrages, have been built to control salinity and maintain water quality, and large scale infrastructure for watering important environmental sites was constructed under The Living Murray program. These assets, together with the River Murray and its storages, comprise the River Murray System.

How the system is run

'River operations' describes the MDBA's direction of key river infrastructure to physically store, deliver, and manage flows of water. The MDBA's river operations role is carried out on behalf of a partnership between the Australian Government, New South Wales, Victoria, and South Australia—referred to as the joint program for River Murray operations. The roles and responsibilities in the operation of the River Murray System are summarised in **Appendix A.**

The MDBA's remit in directing river operations extends only to the River Murray upstream of the South Australian border, and downstream of the Menindee lakes on the Darling River. The MDBA does not operate the South Australian portion of the River Murray, or the northern Basin (see Figure 4). An overview of river operations at a Basin scale, including storages and major infrastructure, is provided at **Appendix D**. Any new storages constructed outside of the River Murray System would also be owned and operated by Basin state governments.

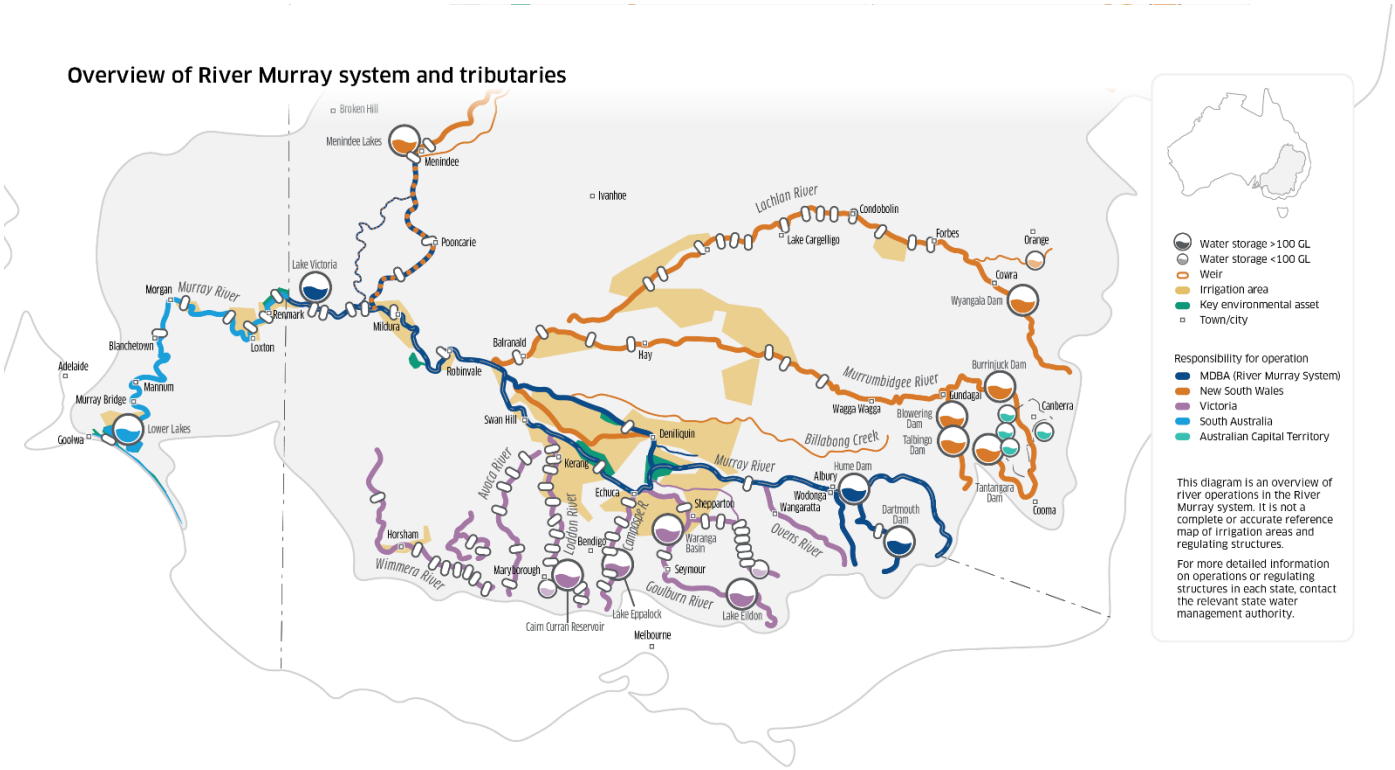


Figure 4: Responsibility for river operations in the River Murray System

To support the river operations function, an extensive hydrometric network enabling monitoring of flows, water quality and rainfall provides critical information and is maintained by the joint programs.

The Agreement sets the MDBA's responsibilities for operating the river. It also provides operating rules the MDBA must follow. Each year, the MDBA's performance against these rules is reviewed by a group of independent specialists that report to the Basin States. The governance of the River Murray System is summarised in Figure 5.

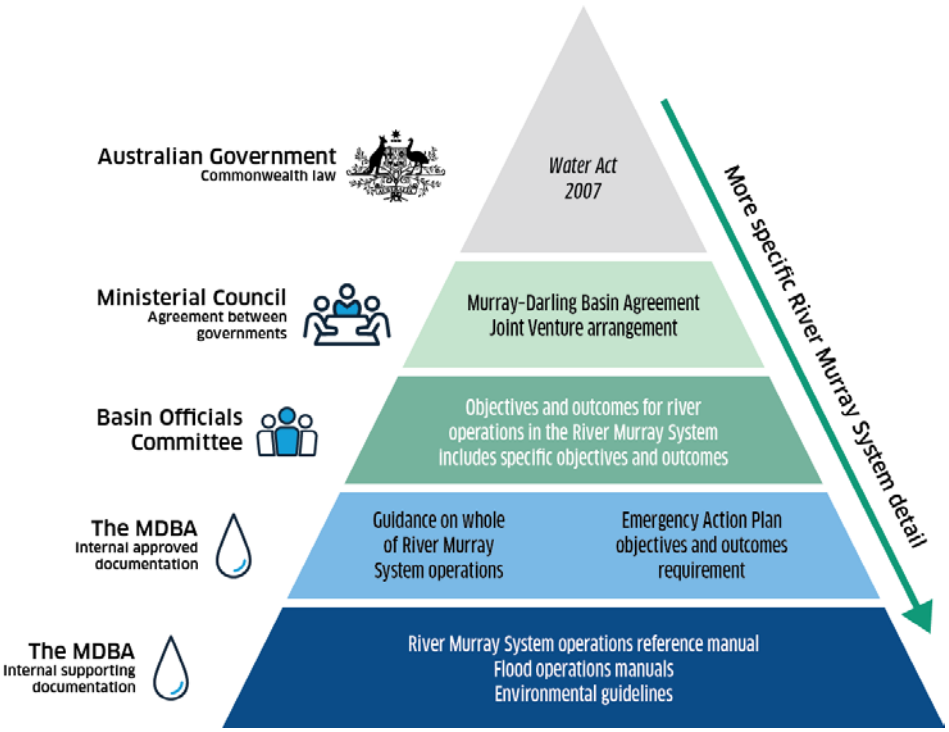


Figure 5: Governance arrangements for the River Murray System

The MDBA manages a number of additional programs under the joint venture which fall outside of River Murray Operations, including:

- *River Murray Environmental and Salinity Assets*: works to enhance environmental water delivery and manage salinity in the River Murray through salt interception schemes;
- *Environmental water coordination:* managing the environmental water entitlements under The Living Murray program; facilitating the coordination of environmental water in the southern basin through the Southern Connected Basin Environmental Watering Committee.
- *Water Quality and Salinity Management:* managing River Murray water quality monitoring program and system of salinity registers that ensure states account for and offset any actions that impact on salinity in the River Murray.
- *Interstate trade movements:* managing the adjustment of state bulk water accounts to reflect the trade of water entitlements and allocations between states and valleys within the River Murray system, including monitoring trade across the Barmah Choke, and if necessary, restricting trade to protect water delivery to existing entitlement holders.

Sharing the water

The Murray–Darling Basin Agreement sets out the rules on how water is shared between the three states of Victoria, New South Wales and South Australia. The rules are complex and change and take account of water availability and climatic conditions. Figure 6 depicts some of the key foundational rules that apply when the system is in normal water sharing conditions. It is important to note the water sharing rules are highly complex, and include many other elements such as losses.

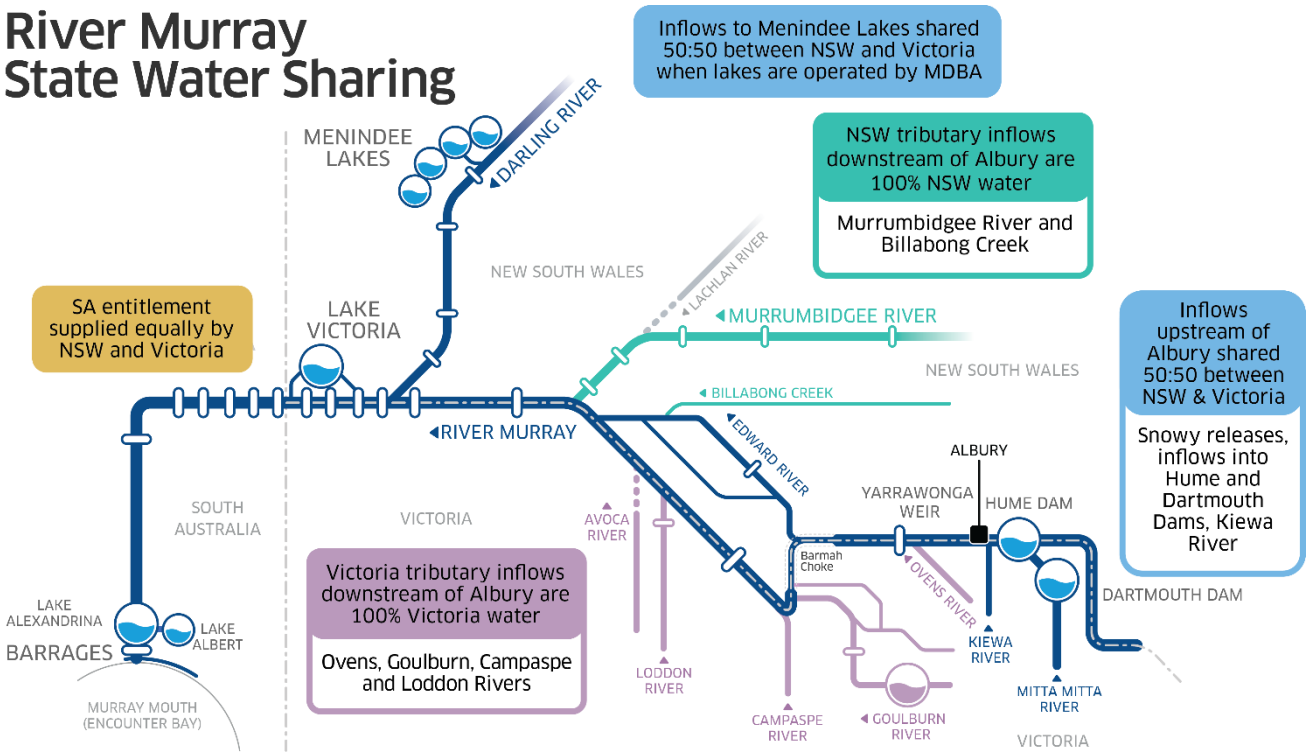


Figure 6: River Murray state water sharing

The MDBA keeps water accounts at the bulk level which record how much each state has used to date. The MDBA also provides forecasts on water available for the remainder of the year under a range of inflow and usage assumptions. Combined, the accounts and water availability forecasts provide the basis for state sharing arrangements. Whilst the MDBA informs Basin states how much water they can expect to have each year, it does not own any water. The MDBA can only release water from storage when there are state orders or system demands to be met, or during flood operations. The MDBA is not involved in making allocations to individual entitlement holders, as this is managed by Basin state governments. The water ordering and delivery processes in the River Murray are illustrated in Figure 7.

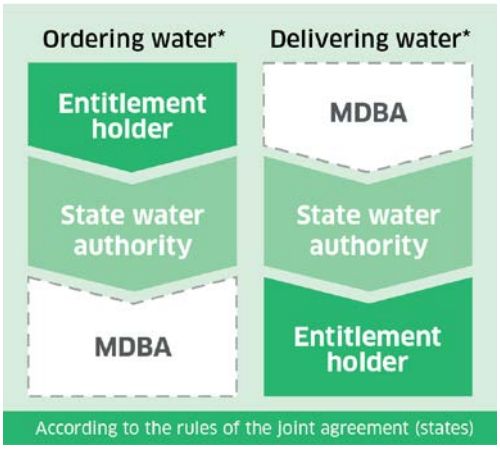


Figure 7: Water ordering and delivery responsibilities

Water authorities in each state are responsible for the physical operation of structures and delivery of water in each state, and include:

- *New South Wales:* WaterNSW
- *Victoria:* Goulburn–Murray Water
- *South Australia:* SA Water Corporation

Managing critical human water needs

The Agreement requires Basin states to set aside water for critical human water needs, and specifies management arrangements for the River Murray system under increasing levels of water scarcity. Across the Basin, the states are responsible for the allocation of water for critical human water needs, in accordance with their own allocation and licencing rules. These critical human water needs are a practical measure to safeguard water for communities in drought, noting that water needs to be available in storages to meet these requirements and deliver this water to communities.

Funding arrangements

The Australian Government funds one quarter of MDBA River Management and administration costs and capital expenditure with the balance shared by New South Wales, Victoria and South Australia in accordance with an agreed cost-share formula. Broadly, the cost sharing between states for river management activities is based on combinations of:

- the functional categories of assets (water supply, salinity mitigation, environmental or navigation)
- water entitlements held and average annual diversions
- other local benefits such as recreation and tourism.

Basin Plan implementation

The Water Act ascribes responsibilities to a number of Commonwealth agencies in developing, implementing and enforcing the Basin Plan. Basin states also have various responsibilities in Basin Plan implementation, and are obliged to report on their activities.

Relevant agencies responsible for implementing the Basin Plan in state governments include:

- New South Wales: Department of Planning, Industry and Environment
- Victoria: Department of Environment, Land, Water and Planning
- South Australia: Department of Environment and Water
- Queensland: Department of Natural Resources, Mines and Energy
- Australian Capital Territory: Environment, Planning and Sustainable Development Directorate

The Basin Plan Implementation Agreement sets out the agreement of all parties to respective implementation roles, which are summarised in **Appendix B**. Some of the major components of the Basin Plan are described in more detail below.

Water Resource Plans

Basin jurisdictions are responsible for the development and implementation of water resource plans. These plans outline how each region aims to achieve local community, environmental, economic and cultural outcomes and are the key mechanism to ensure sustainable diversion limits are not exceeded. Water resource plans set out how water is managed at a local level, while enabling coordination between connected water resources, including systems that cross state and territory borders. Plans are developed by Basin state governments, and assessed by the MDBA to ensure state water management rules meet Basin Plan objectives, including:

- protection of water for the environment
- compliance with water trading rules and sustainable diversion limits
- Traditional Owner values, uses, objective and outcomes
- water quality and salinity targets and strategies to achieve them
- strategies for managing risks
- arrangements for water management during extreme events.

Water resource plans reflect current state water management arrangements that are working and include new arrangements that strengthen water management at a local level.

The MDBA is responsible for assessing plans submitted by Basin states, and making recommendations to the Minister on whether the plans are consistent with the Basin Plan, and therefore can be accredited. In determining whether the plan is consistent with the relevant Basin Plan, regard must be had to the legislative framework, such as state water management Acts, within which the plan operates. The MDBA also consults with peak Aboriginal bodies representing Nations in the northern (Northern Basin Aboriginal Nations) and southern (Murray Lower Darling Rivers Indigenous Nations) Basin regarding whether a plan adequately considers Traditional Owner

objectives and outcomes and that the state has undertaken appropriate consultation with Traditional Owners. The Commonwealth Minister makes the final accreditation decision.

Accreditation of water resource plans extends Commonwealth recognition to state water planning arrangements. This allows the MDBA to monitor and enforce compliance with accredited WRPs. The plans are an important new instrument of water management law in Australia. Underpinned by the principle of adaptive management, they will continue to evolve over time as new information becomes available. They may need to be reaccredited in the future as they are adjusted and improved.

SDL adjustment mechanism

The Basin Plan sets sustainable diversion limits (SDLs), which indicate how much water can be taken for consumptive use while leaving enough water to sustain natural ecosystems.

The SDL came into effect on 1 July 2019, marking the end of the transition period from the Cap system to the SDL framework for water accounting. The Cap system was introduced in 1995 as the first attempt to put limits on surface water diversion. The Basin Plan's SDL framework expands on the Cap framework to include explicit reporting on all forms of water take (watercourses, regulated rivers, groundwater, run-off dams, floodplain harvesting, etc.).

To provide flexibility, the Basin Plan includes a mechanism to adjust SDLs in the southern Basin. The sustainable diversion limit adjustment mechanism (SDLAM) requires a suite of projects to be implemented to allow environmental outcomes to be achieved with less water, or improve the efficiency of water use. Supply projects, which include constraints removal, aim to improve water infrastructure and river operating rules. Efficiency projects aim to improve water delivery systems, including urban and on-farm infrastructure.

Basin state governments are responsible for developing and delivering the projects, including consulting with communities and detailed project design and implementation.

The MDBA is responsible for assessing how effectively the projects SDLAM projects deliver their expected outcomes to calculate and recommend a new sustainable diversion limit. The MDBA also plays a key role in monitoring the operation of the SDLAM by providing an annual update on the progress of the overall package of projects.

The Department of Agriculture is responsible for funding the projects.

Water for the environment

The Basin has historically been managed to develop and support irrigation enterprises. The river rules and infrastructure have matured over time to enable the storage of water and its delivery to irrigators when called upon. Through the Basin Plan, the management framework is being adapted so that the environment's needs will also be embedded into Basin water management practices.

'Water for the environment' is used to improve the health of the Basin's rivers, wetlands and floodplains. Environmental water is allocated to federal and state environmental water holders

across the Basin, who make decisions about when, where and how much water is released for the environment.

Planning for and delivering water for the environment is an emerging practice in the overall context of Basin water management and one that is challenging the boundaries of existing river operations. It is also relatively early days in the institutional arrangements for environmental water policy and management within the Commonwealth. The MDBA, environmental water holders and State Water Resource Managers have worked cooperatively and creatively to explore and trial innovative methods for the delivery of water for the environment. Since the Plan came into effect, there have been over 750 environmental watering events, sending 4500 GL of water down the Basin's waterways. The events are managed by the Commonwealth and the states, and target specific environmental outcomes, which are linked to the long-term objectives of the Basin Plan. The volume of water being delivered has increased markedly over time, as co-ordination between the Commonwealth and Basin states, river operators and environmental water holders has improved.

The Southern Connected Basin Environmental Watering Committee (SCBEWC) provides an important forum for the coordination of environmental water delivery across multiple water holders in the Southern Basin, and the Northern Basin Coordination Committee has been recently established.

The SCBEWC is made up of Basin state and Australian Government environmental water holders, water managers and river operators. The Committee was established by Murray Darling Basin Ministerial Council in 2015 to coordinate the delivery of all environmental water to maximise environmental outcomes and give effect to the Environmental Watering Plan, including the Basin-wide Environmental Watering Strategy.

More broadly across the Basin, basin state and territory governments and the CEWH plan and coordinate the delivery of water for the environment depending on local, regional and cultural needs and climatic conditions.

The Department of Agriculture is responsible for recovering water through on- and off-farm infrastructure investment and water purchases. Water rights recovered through the department's programs form part of Commonwealth's environmental water holdings managed by the CEWH.

The Commonwealth environmental water holder has a mix of entitlement types, including regulated, unregulated and groundwater licences with varying levels of security. Commonwealth environmental water entitlements are subject to the same allocation, carryover and other rules as equivalent entitlements held by other water users. They are also subject to the same fixed and variable tariffs as other equivalent water users across the Basin.

Water entitlements

Each Basin state is also responsible for keeping retail water accounts and allocating its share of the available water resource to water users. Responsibility for water accounting and allocation varies between states, with some state departments responsible while in other states water authorities are delegated these responsibilities.

Each state has developed its own suite of entitlements and rules around how to allocate the state's share of water to their entitlement holders, including in what order allocations are prioritised. This means allocations, water orders and delivery of water all work in a different way from state to state and will continue to do so.

Generally, the water licencing regimes in each state comprise of the following elements, noting that terminology differs across states:

- *Water rights:* Are a right to take and use water without the need for a water licence, provided certain conditions are met. Water rights generally include stock and domestic, and in some states cultural access rights for recognised Traditional Owners. In Victoria, water rights are more complex, as the rights to take and use water are broken up into several components.
- *Water entitlement*: Water entitlements are rights to an ongoing share of water within a system. There are over 150 different classes of water entitlement in the Murray–Darling Basin. Note that water entitlements in Queensland are called water allocations. Details of the different classes of the 70 most traded water market products can be found at https://www.mdba.gov.au/managing-water/water-markets-trade/water-markets-product-information. Further information on class types is available from the Bureau of Meteorology and Basin state governments.
- *Water allocation*: Water allocations are the amount of water distributed to users (water entitlement holders) in a given year. Allocations against entitlements change according to rainfall, inflows into storages and how much water is already stored. Allocations can increase throughout the year in response to changes in the system. Some water entitlement types also allow allocations to be carried over to the next water year.
- *Water usage:* Water usage is how much water is actually used from the water that is allocated. When water is allocated to an entitlement holder, they use it as needed—sometimes they only use a proportion of their allocated water. This is an individual business decision, where entitlement holders consider climate and rainfall, their cropping cycle, and their own business plans.
- *Retail water accounts*: Retail water accounts for individual entitlements are kept by Basin states. The actual amount of water used by an entitlement holder will be debited from the entitlement holder's water account. At the end of each water year, Basin states assess how much water was used, and report this information to the MDBA.
- *Water registers:* used by Basin states to record the trade of entitlements or temporary allocations against entitlements.

These arrangements provide water entitlement holders with knowledge about when they will receive water and how much, while allowing Basin state governments to manage water availability through varying climatic conditions.

Northern Basin entitlements

Consistent with the wider Murray–Darling Basin, water extraction in the northern Basin is governed through an entitlement framework. Entitlements are of several types and have varying reliabilities. Each entitlement includes a specific set of conditions under which water can be accessed by the entitlement holder. The overall effect of the entitlement framework is to adjust access in response to the prevailing climatic conditions—more water can be taken in wet years, less water in dry years. Irrigators have built business models that recognise this need to adjust to

conditions. Many irrigators across the northern basin hold a mix of entitlements with different access patterns to strengthen their ability to adapt to the water availability in each year.

The southern basin is primarily a 'regulated' system, in which flow is controlled (i.e. regulated) through a series of large public storages (dams). Under this system, entitlement holders receive an allocation of water each year and are able to order this water from an upstream storage. However, the northern Basin comprises rivers with different levels of flow regulation. Some parts of the NSW northern basin resemble the southern rivers, in that entitlement holders can order water against their allocation from an upstream storage. However, public storages in large parts of the northern Basin are relatively small, hence the entitlement framework has a different mode of operation. Instead of ordering water from an upstream storage, entitlement holders in the less regulated regions access water depending on the river conditions. Each entitlement will have a set of conditions for water take—these generally comprise an annual limit (to control the total volume of water taken in each year) and a series of daily conditions such as river height and pumping rate.

In some catchments (such as the Lower Balonne) the water available for take is announced from a central river operations body. In other catchments (such as the Barwon–Darling), irrigators have flexibility to take water when they wish, subject to the conditions of their entitlement. As part of the northern Basin toolkit measures and NSW commitments to better manage environmental water, the Barwon–Darling is expected to shift towards a more active management approach, analogous to the management arrangements in the Lower Balonne.

In addition to taking water from the river, irrigators in the northern Basin can also access water from overland flow—that is, from water that runs across the land after rainfall, flooding, or after it rises to the surface naturally from underground. Capturing this water on a floodplain is referred to as overland flow development or floodplain harvesting.

Floodplain harvesting has been regulated under the cap system since 1995, and since the Basin Plan was adopted, the Queensland and NSW governments have been working to improve the measurement and compliance of floodplain harvesting to ensure this use is limited.

It is important that any change to licenses and new improved information about water usage is reflected across the whole water management system and in the day-to-day operation of the Basin Plan. Any changes will be independently assessed before they are incorporated into the Basin Plan. It is expected that as licensing, monitoring and compliance arrangements are improved, the total amount of water used through floodplain harvesting will be managed within the limits established under the Basin Plan.

Water markets

Water in the Murray–Darling Basin can be bought and sold through the water market, encouraging more efficient and highest value water use. Water prices reflect supply and demand factors, and differ across regions, type of water right, and with time. Annual water trade in the Basin is worth about $2 billion.

Water can be traded within and between catchments (where possible), or along river systems. The majority of water trade is in surface water, however groundwater trade is also available.

There are two types of water trade:

- *Permanent trade* is the trade of water entitlements (entitlement trade). For example, if an entitlement holder sold their water entitlement.
- *Temporary trade* is the trade of water allocations (allocation trade). For example, an entitlement holder can sell their allocation in any season, based on their own business model.

Anyone holding water rights may trade these in accordance with Basin State trading rules. Under the Basin Plan, Basin State trade rules or restrictions should be based upon physical constraints (such as geography or lack of connections to the system) or water supply considerations. Trading allows water users to buy and sell water in response to their individual needs, and has become a vital business tool for many water users, allowing choice and flexibility in business decision-making and reducing risk.

The New South Wales, Queensland, South Australian and Victorian governments are primarily responsible for managing water markets, and each state has its own process and rules for allocating and trading water. Irrigation infrastructure operators create and maintain trading rules within their irrigation networks.

The Basin Plan water trading rules provide a consistent water trading environment across the Basin, while recognising states and irrigation infrastructure operator's ability to restrict trade where necessary. The trading rules came into effect on 1 July 2014, and for the first time water markets were subject to uniform rules designed to ensure a competitive, level playing field.

The Basin Plan trading rules aim to manage restrictions on surface water trade (other than those relating to physical constraint, hydrological connectivity, environmental impacts, and third party impacts), and improve access to market information. Water resource plans also require groundwater trading arrangements to be implemented for the first time.

The MDBA facilitates fair, consistent and transparent water trade across the Basin by providing information on water trading, and working with Basin states to ensure state rules comply with the Basin Plan's trading rules. The Australian Competition and Consumer Commission (ACCC) is the enforcement agency for the water market rules and the water charge rules, and provides advice to the MDBA on the Basin Plan water trading rules.

Under its Basin Plan compliance function, the MDBA may also conduct audits in relation to water trade. In the past year the MDBA conducted an audit of trade prices recorded in 2017-18, in order to assess how effectively each Basin state collects, validates, records and reports water trade price information. The central finding was that none of the Basin governments have robust arrangements in place to gather comprehensive, accurate price information. As a consequence, some of the data reported by the states and published in consolidated form by the Bureau of Meteorology is incomplete and inaccurate.

Accurate trade price reporting is essential to confidence in the water market and compliance with the Basin Plan. The Plan clearly requires sellers to tell the relevant state agency the price of their trades and for their part, state agencies are obliged to provide this information to the Bureau of Meteorology for publication.

There is no single point of truth for Basin trade data, as it is dispersed between various approval authorities, using a multiplicity of processes. The audit had difficulty obtaining information from some Basin states, due to processes involving multiple entities that capture prices on different systems for different purposes.

It is clear that trade processes and procedures are largely designed and implemented to capture volume information and account balances for the purpose of water management, rather than trade and price information for market purposes. Mandatory price reporting across all Basin states is a relatively new requirement brought under the Basin Plan in 2014, and as a consequence compliance and enforcement was found to be sporadic. The MDBA is working with Basin states to rectify information and transparency issues identified by the audit.

New water infrastructure

Building new water infrastructure is possible under the Basin Plan—indeed the mechanism to adjust the sustainable diversion limit (the SDL Adjustment Mechanism) is all about increasing the efficiency of infrastructure (old and new) in the Basin.

The MDBA is required to ensure that State governments are using no more than the long-term annual average limit of water that can be taken from individual catchments within the Basin. This requires that State governments have taken the maximum level of water use into consideration in any new development proposals.

As part of implementing the Basin Plan, the MDBA's role is to make an independent assessment of total water use in an area resulting from, for example, construction of a new dam, and evaluate its overall impact on the relevant SDL.

Data management

Managing river systems and their water-dependent ecosystems is complex and requires planning and decisions to be made on the best available information. Basin states and the MDBA hold information on storage volumes, river flows (including models), and water orders for the systems they are responsible for. The MDBA also relies on the Bureau of Meteorology's Australia-wide historic water dataset to inform its planning and operations.

The MDBA holds bulk water account information on how much of the total water available in the River Murray System belongs to each state. Basin states hold water account information at the retail scale for water entitlement holders. This includes the amount of environmental water available under entitlements held by the environmental water holder. The MDBA supports environmental water planning in the River Murray System with modelling and river flow data. The MDBA is also responsible for accounting for take against the sustainable diversion limits.

All Commonwealth and State departments and agencies conduct their own monitoring to determine the outcomes of their water management activities. For example, the Commonwealth Environmental Water Holder monitors environmental flows to determine and report on the environmental outcomes achieved by the watering event. The MDBA conducts similar monitoring for The Living

Murray environmental water entitlements. Basin states collect a range of information to monitor and review their own water policies and management plans, including water resource plans.

There are reporting requirements in the Basin Plan for all departments and agencies to ensure information to evaluate the Basin Plan is provided to the MDBA for this purpose.

Management of data across jurisdictions and between federal government agencies is highly variable, and technology, format and frequency of measurement differ across different agencies. The standardisation of data management systems would help to improve data sharing arrangements and enable the development of an adaptable and enduring Basin Scale view of water information.

A number of initiatives to improve data sharing between government agencies are currently underway. The MDBA can provide more details on these on request.

Funding arrangements

The Intergovernmental Agreement on Implementing Water Reform in the Murray–Darling Basin (IGA) is an undertaking by the Commonwealth and Basin states to ensure that the Basin Plan is implemented in a cost effective manner to support the goals of the Plan. Under the IGA, it was agreed that the Commonwealth would provide financial support to the Basin States via the National Partnership Agreement on Implementing Water Reform in the Murray–Darling Basin (NPA). This NPA recognises the costs that states will incur in the implementation of the Basin Plan, including through the development of WRPs, implementation of new compliance and reporting requirements, and amendment of water trading rules.

The NPA sets out milestones for implementation of reforms and each state is required to report on their milestone progress through an annual statement of assurance. The Department of Agriculture is responsible for the assessment of the states' progress against these milestones, and is also responsible for funding projects under the SDLAM and Northern Basin toolkit measures.

Water management compliance

An effective and fair compliance system underpins the integrity of water for the environment, water resource plans, water markets and water entitlements. Basin states are responsible for ensuring compliance by water users with their water laws, and for complying with their own obligations under the Water Act, the Basin Plan and WRPs. The 2018 Compliance Compact signed by Basin Water Ministers also sets out a range of compliance actions that the Australian government and Basin state governments have agreed to undertake to improve water compliance in the Basin.

The regulatory agencies in each Basin state include:

- *New South Wales*: Natural Resources Access Regulator - independent regulatory body that sits within the Department of Planning, Industry and Environment.
- *Victoria*: Department of Environment, Land, Water and Planning
- *South Australia*: Department for Environment and Water
- *Queensland*: Department of Natural Resources, Mines and Energy
- *ACT:* Environment Protection Authority - sits within independent regulatory agency Access Canberra

A summary of roles and responsibilities for compliance in the Basin can be found at **Appendix C.**

The Water Act identifies the MDBA as the appropriate enforcement agency for a contravention of the provisions of the Act relating to the management of Basin water resources, including the development, implementation and oversight of compliance with the Basin Plan. The compliance activity undertaken by the MDBA does not duplicate the compliance activities of the Basin states. The Commonwealth Minister also has enforcement powers with respect to contraventions of a provision related to water information functions.

The MDBA's role is to ensure there is compliance with the requirements and regulatory responsibilities as specified in the Basin Plan, and more broadly to provide assurance over the management of Basin water resources. The MDBA regulates water users and managers, including the Basin state water agencies who have day to day responsibility for water planning, rule-setting, river operations and state-level compliance.

The MDBA's compliance approach uses statutory and non-statutory tools to audit and report on particular compliance activities, and to help develop the 'regulatory craft' among practitioners. The MDBA focuses on seven compliance areas:

1. Water resource plans
2. Sustainable diversion limits
3. Illegal take
4. Water metering and measurement
5. Protection of environmental water
6. Trade rules
7. Water quality and salinity

There are a range of mechanisms available to the MDBA to maintain compliance with the Basin Plan, including:

- *Informal negotiations* the MDBA to educate the offender about how their actions constitute non-compliance with the Basin Plan and discuss options for preventing or remedying the behaviour.
- *Infringement notices* may be issued in response to breaches of the Basin Plan or Water Act for 'minor offences'.
- *Enforcement notices* may be issued by the MDBA for a contravention of the Basin Plan or a water resource plan, requiring a person to do, or stop doing, a specific action, and may require the person to undertake make good actions.
- *Injunctions* may be applied for by the MDBA in the Federal Court to stop a person or entity form contravening the Water Act, Basin Plan, the Water Trade Rules or a water resource plan.
- *Declarations of contravention* may be applied for by the MDBA in a Federal Court for a declaration of a contravention of the Water Act, Basin Plan or Water Resource Plan.
- *Civil penalty proceedings* may seek to provide an appropriate financial penalty to the non-compliant entity and act as a deterrent. The MDBA will consider commencing civil proceedings in accordance with its litigation approach.
- *Enforceable undertakings* are an alternative to civil proceedings, and focus on remedying the harm caused. They allow the non-compliant entity to voluntarily enter into a binding agreement to undertake agreed tasks to settle an alleged contravention of the Basin Plan and Water Act.

The MDBA works with all regulated entities to ensure they are aware of, and understand how they can comply with, their obligations under the Water Act and the Basin Plan. While MDBA has clear roles in Basin Plan compliance, most cases of enforcement are addressed through state-level mechanisms. However, following the 2017 Basin-wide Compliance Review, the MDBA has sought to clarify and enhance its powers in relation to pursuing cases of non-compliance by individuals through legislative amendments.

The MDBA maintains compliance oversight through annual compliance and reporting requirements, which obligates Basin governments to annually report on their compliance and enforcement activities. In addition, every three months the MDBA updates and publishes its register of non-compliance allegations received. This register reports all allegations received, and includes matters referred to state water agencies where it has been determined that they have regulatory responsibility for the issues raised.

When the MDBA does receives allegations of non-compliance on issues where the Basin state has regulatory responsibility, these are referred onto the appropriate water agency for consideration. In these cases, Basin state agencies will make independent decisions about investigation and enforcement activities, the MDBA follows up with state agencies on a regular basis to ensure the MDBA is satisfied with action taken by the relevant state.

Appendix A: Roles and responsibilities in River Murray operations

Entity	Responsibility
The Ministerial Council	• Major policy issues relating to management of water • providing direction to the Basin Officials Committee • amendments to the Murray–Darling Basin Agreement
The Commonwealth Minister	• Chairs the Ministerial Council as the Australian Government representative • Appoints the Chair of the Basin Officials Committee.
The Basin Officials Committee	• gives effect to policies or decisions by the Ministerial Council • makes high-level decisions in relation to river operations • sets objectives and outcomes to be achieved by the MDBA in relation to river operations • facilitates cooperation and coordination between the Australian Government, the Basin states and the MDBA in funding works and managing Basin water and other natural resources
The MDBA	• shares the water of the River Murray system between the states by providing water availability assessments and maintaining water sharing accounts • is directed by the objectives and outcomes set by the Basin Officials Committee • manages water storage, management and delivery at three major storages – Dartmouth and Hume dams and Lake Victoria • calls water from Menindee Lakes (when above certain thresholds) for use in the Murray system • directs the operation of key river regulating structures upstream of the South Australian border as specified in the Agreement • oversees the construction, operation and maintenance of all River Murray system assets, including those in South Australia
The Commonwealth Environmental Water Holder	• manages the Commonwealth's environmental water holdings • reports on the use of environmental water, including the outcomes achieved
Bureau of Meteorology	• Responsible for compiling and making available water information, including producing a National Water Account and collecting and publishing water information.
The Basin States (NSW, Victoria and South Australia)	• carry out the physical operation and day-to-day management of the river's key operating structures at the direction of the MDBA • operate key tributaries of the River Murray • appoint state constructing authorities to build and manage River Murray operations assets

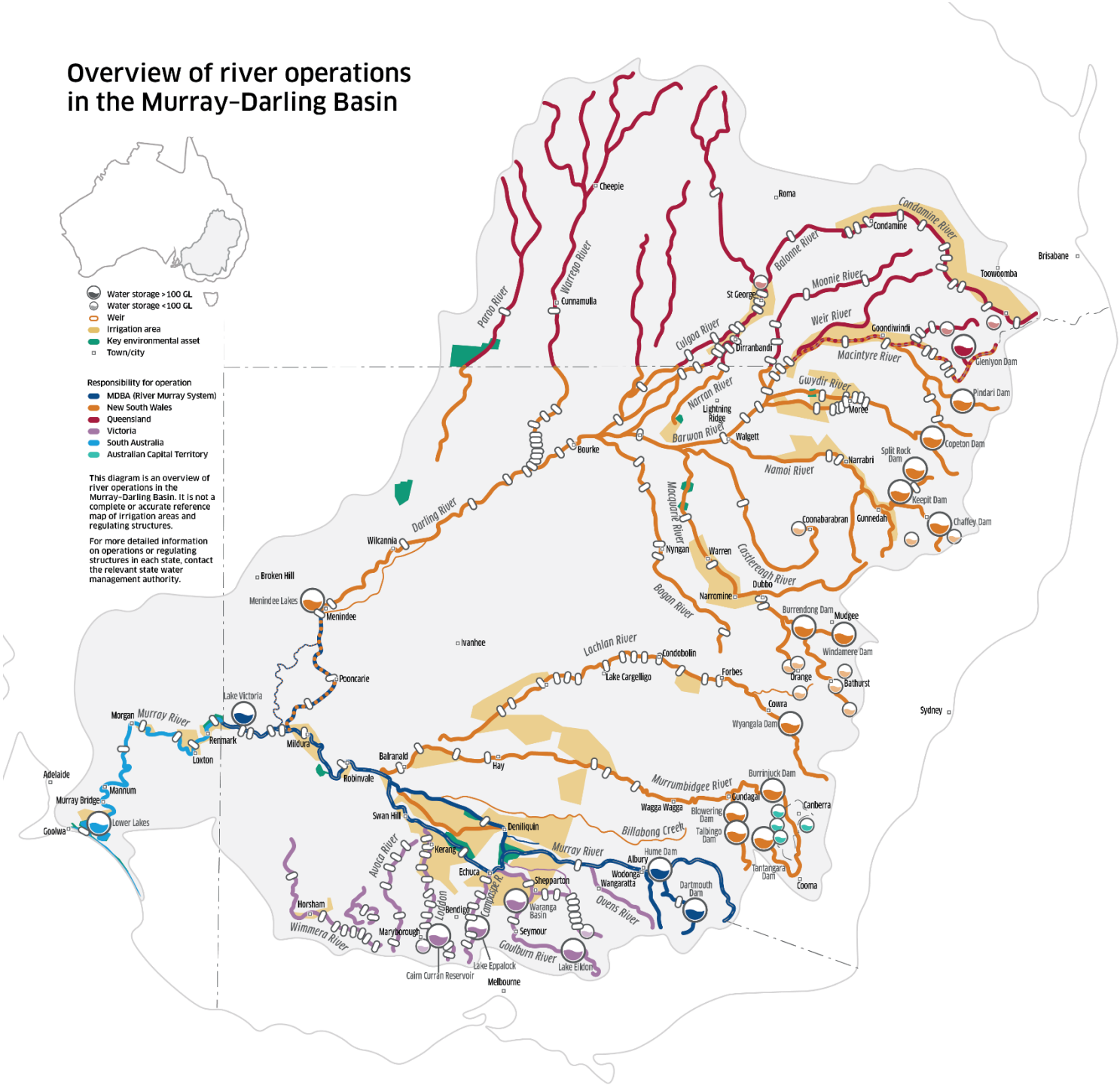
Appendix B: Roles and responsibilities in Basin Plan implementation

Entity	Responsibility
The Commonwealth Minister	• make the final determination on the accreditation of water resource plan • approves program funding allocations • chairs the Murray–Darling Basin Ministerial Council • evaluates the progress of Basin Plan implementation
The Commonwealth Department of Agriculture	• Recover water through on and off-farm investment and water purchase • Fund projects through the SDL adjustment mechanism • Chair the Basin Officials Committee
The Commonwealth Environmental Water Holder	• Managing the portfolio of Australian Government environmental water holdings • Monitor and report results of water for the environment
Productivity Commission	• Responsible for conducting five yearly inquiries into the effectiveness of the implementation of the Basin Plan and water resource plans.
The MDBA	• setting and altering SDLs • Work with Basin states to develop and accredit water resource plans • Measure, monitor and record the quality and quantity of the Basin's water resources • Plan, coordinate and prioritise environmental watering as a Basin scale • Support and conduct research and investigations into the Basin's water resources and dependent ecosystems • Provides information on water trading and works with Basin state governments to ensure the state rules comply with the Murray–Darling Basin Plan's trading rules • Evaluate and review the Basin Plan
Australian Competition and Consumer Commission	• Provide advice on water trade rules and manage complaints
The Basin States	• Develop water resource plans • Sets process and rules for allocating and trading water • Develop and implement SDLAM projects • Plan and deliver environmental watering at a local scale • Monitor and report on Basin Plan implementation at a local level

Appendix C: Roles and responsibilities for compliance in the Basin

Entity	Responsibility
The MDBA	• Monitor and enforce Basin-scale compliance, particular in relation to: – Water resource plans – Sustainable Diversion Limits – Illegal water take – Water metering and measurement – Protection of environmental water – Trade rules – Water quality and salinity • Support and guide best practice
The Basin States	• Implement and enforce compliance locally according to rules established in WRPs and state laws more broadly

Appendix D: Overview of river operations in the Murray–Darling Basin



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